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A contrastive analysis on logistics costs between China and some developed countries

Xuanxuan Wu

WORLD MARITIME UNIVERSITY

Shanghai, China

A CONTRASTIVE ANALYSIS ON LOGISTICS COST BETWEEN CHINA AND SOME DEVELOPED COUNTRIES

By

WU XUANXUAN

China

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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 research paper reflect my own personal views, and are not necessarily endorsed by the University.

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(Wu Xuanxuan)

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Supervised by

Professor Shi Xin

Shanghai Maritime University

Assessor

Professor Shashi Kumar
Maine Maritime Academy, USA

World Maritime University

Co-Assessor

Professor Liu Wei

Shanghai Maritime University

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Abstract

Title of Dissertation: **A Contrastive Analysis on Logistics Cost between China and Some Developed Countries**

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Logistics is known to all today as the third most important source of profit-making. One of the major tasks for the study of logistics management is to conceive and work out proper measures to reduce the total logistics cost.

The total logistics cost mainly comprises the costs related to inventory holding, transportation, logistics administration and operations management. This dissertation is aimed at conducting a contrastive analysis focusing mainly on the inventory holding and transportation costs between China and some developed countries in the hope of detecting or diagnosing the causes that express why the total logistics cost in China is much higher than that in the developed countries and proposing some tentative measures to attack the existing problems in this area.

On the basis of some modern logistics theories and the data and facts collected, and through the contrastive analysis, we find that the costs of inventory holding and transportation incurred in China currently are so alarmingly high compared with what happens in developed countries that it should deserve great attention and concern on the part of the logistics industry in China, since the country still enjoys the advantages of richer but cheaper resources such as labor, land, and so on. Our findings also show that the primary causes leading to the high cost of logistics in China can be boiled down to the factuality of its backward logistics infrastructure, inefficient information resources sharing mechanism, unfit operational patterns, scanty knowledge of logistics management, especially the underdevelopment of inter-modal transportation system, which are all undesirable. Therefore, some plausible proposals and effective

measures are recommended tackling the problems and reducing the logistics costs with a view to serving the rapid development of the logistics industry in China.

KEY WORDS: Inventory holding cost; Warehousing cost; Transportation cost; Third party logistics; Integration of supply chain; Inter-modal transportation

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

JIT	Just In Time
RFID	Radio Frequency Identification
3PL	Third Party Logistics
EPC	Electronic Product Code
RONA	Return on Net Assets
GDP	Gross Domestic Product
WTO	World Trade Organization
CFS	Container Freight Station
CFLP	China Federation of Logistics and Procurement

A Contrastive Analysis on Logistics Cost between China and Some Developed Countries

Chapter One Introduction

1.1. Background and Significance of the Subject

In view of the development of logistics industry around the world, we can see clearly that this industry has been growing very rapidly, especially in the developed countries. It turns out that the total logistics cost in the United States was about 970 billion dollars in the year 2001, almost twice as much as the cost of the country's high-tech industry, and the proportion of the total logistics cost in the U.S. GDP was held around 10%, while in Japan, the total logistics cost was about 24 billion dollars which accounted for some 11.40% of the country's GDP. It is true that over the recent years the logistics industry in China has been on the rise and developing at a fast pace, however, a well-integrated system of the industry has not yet maturely shaped in China, just as what Morgan Stanley, the famous American scholar in this area, has analyzed in his article entitled "Chinese Logistics Report" that, the proportion of the total logistics cost in the Chinese GDP was around 20%, which is by no means a satisfactory situation. In view of the current situation of logistics industry in China, this dissertation attempts to conduct a contrastive analysis on the logistics cost between China and some developed countries, aiming at analyzing the reasons and finding out possible solutions to tackle with the problems why the costs in the Chinese logistics industry are much higher than that of the developed countries while the cost on land, labor, transportation, as well as some other related resources, is much cheaper in China.

The control of logistics cost definitely plays a very important role in logistics management. After China's entry into the WTO, logistics industry in China has to meet with the imminent requirements, concerning that the Chinese economic entities need to adapt themselves to the global economic development and that the Chinese companies have to engage themselves in both domestic and international competitions in order to meet the challenges in the development of the logistics industry. A contrastive analysis on logistics cost between China and the developed countries will bear such practical value and significance in the sense that it can help to find out some effective measures to bring down the logistics cost and help us to acquire the advanced knowledge and experience from the developed countries such as the United States of America and Japan.

1.2. Methodologies and Approaches Adopted for the Research

The total logistics cost include inventory holding cost, transportation cost, and the costs involving the logistics administration and management. Inventory holding cost and transportation cost are the two major parts in the constitution of the total logistics costs.

This dissertation will begin with the analysis on the inventory holding cost. Data and facts show that there are three main factors leading to the reasons why the inventory holding cost is higher in China: (1) Facilities in China are not so advanced as those in the developed countries. (2) There exist some backwards in the utilization of information technology system. (3) The integration of the supply chain system is not yet so desirable in China. The author of this dissertation will attempt to analyze these three reasons in detail by providing the relevant data and facts concerning the "Just-in-time" strategy as practiced by Dell Company and some other firms in this regard.

Secondly, this dissertation will conduct an analysis on the transportation cost. The author holds that the possible causes leading to the higher transportation cost in our country are that: (1) The information sharing and communication system in transportation industry is far from being satisfactory. (2) The efficiency of the operation is relatively low. (3) The management level of the enterprises is not high enough to meet the demand in the rapidly developing logistics industry of today. (4) The transportation industry lacks uniform standards. (5) The transportation mode is not suitably adopted in some areas of logistics movement. The analysis is also to be based on the proven data and facts.

Finally, some tentative suggestions and pragmatic measures will be offered which are expected to be conducive to cutting down the total logistics cost.

1.3. Structure and Format of the Dissertation

This dissertation consists of 6 chapters. Chapter One *Introduction* gives a brief account of the background and significance of this contrastive analysis on logistics cost between China and some developed countries, the methodologies and approaches adopted for the research and the structure and format of the dissertation. Chapter Two *Theories and Researches on Logistics Cost and Basic Concepts of Logistics Cost* serves as a survey to some of the recent theories and researches related to the study of logistics cost in the developed countries and some basic concepts about inventory holding cost, transportation cost and the cost of customer service, and comes up with the standpoint that inventory holding cost and transportation cost are the two major parts in the constitution of the total logistics cost. In Chapter Three *A Contrastive Analysis on Inventory Holding Cost between China and Developed Countries (and Some Defects of Warehousing Industry in China)* a comparison is made regarding the inventory holding costs between China and the developed countries on the basis of

the data and facts collected from some authentic writings as well as from other convincing resources. Chapter Four *A Contrastive Analysis on Transportation Costs between China and Developed Countries (and Some Defects in Transportation Industry in China)* moves on to the comparison of the transportation cost and also explores some of the major causes leading to the high logistics cost, taking into consideration the backwardness of the transportation industry in China. In Chapter Five *Some Suggested Measures for Reducing the Total Logistics Cost in China,* some plausible proposals and effective measures are tentatively recommended for the purpose of tackling the problems and reducing the logistics cost with a view to serving the rapid development of the logistics industry in China.

Chapter Two Theories and Researches on Logistics Cost and Basic Concepts of Logistics Cost

Logistics is known to all today as the third most important source of profit-making, and logistics management strategies have always been the effective measures to improve the competency of enterprises. One of the major tasks for the study of logistics management is to conceive and work out the proper measures to reduce the total logistics cost and increase the operational competency of companies.

How well the logistics industry of a country develops will directly represent the degree of the economic development of that country, which, to a certain extent, is also an important symbol of a country's national comprehensive strength. The faster the logistics industry develops and the lower the logistics cost is, the less the total logistics cost will occupy in that country's GDP.

2.1. Researches on Logistics Cost in Some Developed Countries

In 1961, Edward W. Smnykyee, Ronald J. Bowersox and Frank H. Monsman published their book entitled *Logistics Management* which was the first textbook to introduce systematically the knowledge and concepts of logistics management. This book elaborates profoundly the concepts of logistics system and the total cost, which laid the solid foundation for the later development of logistics management as a independent discipline.

In 1962, Peter F. Drucker, the great scholar in the field of management in the U.S.A, published his article with the title *The Economy's Dark Continent* in the journal *Fortune* in which he emphasizes that much attention should be paid to the area of logistics management in the process of circulation. This paper triggers an important

promotion to the industry and great interest in this topic among the academic circles.

Robert V. Delaney, the author of the authoritative annual *State of Logistics Report*, has conducted profound researches in the area of logistics total cost whose achievements represent the advances of researches on logistics cost management in the U.S.A. He considers that logistics is, in a sense, the management of stock which is shown in the whole process of motional or motionless state. That is to say, logistics total cost consist of transportation cost, stock holding cost, logistics administration and management cost, and other related costs. The constitution of total logistics costs in the U.S.A in year 2001 that Mr. Delaney has studied is as follows.

Table 2-1 Total Logistics Costs of American Business in Year 2001

		Billion dollar
Inventory holding cost		328
1	Interest rate	55
2	Taxation, depreciation, insurance	195
3	Warehousing cost	78
Transportation cost		605
1	Road transportation	494
2	Truck transportation between cities	333
3	Local area truck transportation	161
4	Railway transportation	38
5	Sea transportation	28
6	Pipeline transportation	9
7	Air transportation	24
8	Forwarding agents	7
9	Costs in relation to consigners	5

Logistics administration and management cost	37
Total logistics costs	970

Source: *Rosalyn Wilson & Robert V. Delaney, Understanding Inventory- Stay Curious, 13th Annual* State of Logistics Report (2002).

Mr. Delaney has compiled and edited the annual *State of Logistics Report* for 13 years; however, the projection of the concepts of total logistics costs can be traced back to1960.

The reason why the proportion of the total logistics costs in the U.S. GDP is relatively low is mainly because of the advanced logistics management system of the country.

The proportion of the total logistics costs in U.S. GDP is about 10%. Besides these, in recent years, the proportion of logistics cost in the GDP in many European countries, Japan and other developed countries is more or less the same to the one in the U.S.GDP, which is also more or less around 10%. But it is estimated that the proportion of the total logistics costs in the GDP in China is around 20%.

Logistics cost has always been one of the major concerns in logistics industry in Japan. Since 1965 when the first open investigation of logistics cost had begun in Japan, such investigation has been continuously conducted once every 10 years in the country.

Mr. NISIZAWA OSAMU of WASEDA University in Japan, the authority of the logistics cost calculation, proposed the “Iceberg Model of Logistics Cost”, which thoroughly explains the subtle difficulties in the recognition and determination of all the incurrence of logistics cost. The meaning of the “Iceberg Model of Logistics

Cost" is that we can hardly have an exactly good command of the total content of the logistics cost. When referring to logistics cost, all that we can see is only a little part of the iceberg that is above the surface level, but we may fail to see the whole iceberg which is hidden underneath. The iceberg below the surface level is actually the main part of the logistics cost.

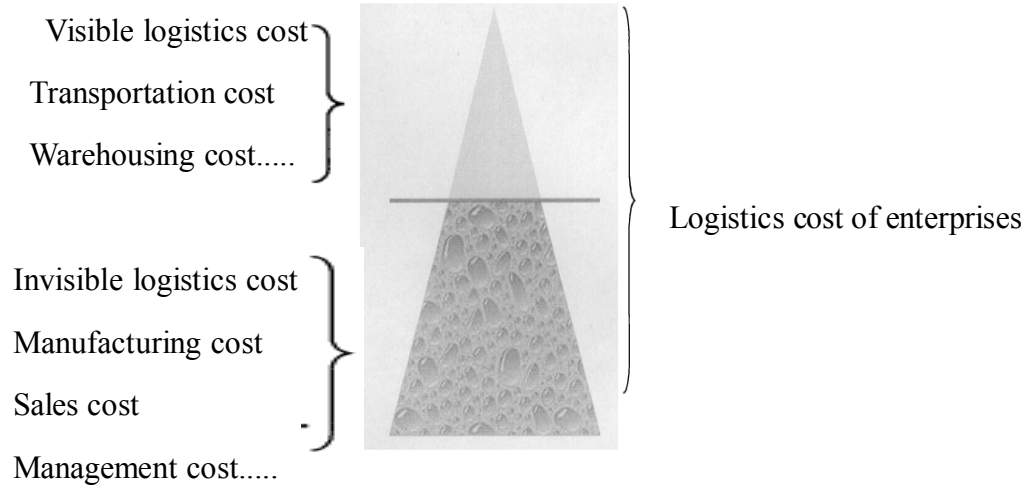

Figure 2-1 Iceberg Model of Logistics Cost

Mr. NISIZAWA OSAMU also proposed the concept of "The Third Profit Source", which described the potentialities and benefits of logistics. The theory of "The Third Profit Source" is based on the following aspects:

(1). Logistics can be separated from the whole circulation process completely, because it has its own system, its own aims and it can be managed, and therefore it can be totally justified as an independent sector.

(2). From the standpoint of logistics services, logistics can create better opportunities of profits for those manufacturing enterprises that receive logistics services, thus becoming the "The Third Profit Source" of the manufacturing enterprises.

(3). Effective logistics activities can optimize the economic system of the society and the operation of the whole national economy, reduce the operational costs of the

whole society, and increase the total profit of the national economy.

There also exist some other theories with regard to the researches on logistics costs in some developed countries, such as:

1: Theory of "Trade-offs"

There are trade-offs among a certain number of functionally essential factors of logistics, that is, if profits fall onto one key factor in the logistics system, there must have losses to another factor or even several other factors in the system.

(1) "Trade-off" between logistics cost and service level. High-level service is guaranteed by high-level logistics cost. Without great technological progress, it would be difficult for an enterprise to improve its logistics service level and to reduce the logistics cost on both ends at the same time. Generally speaking, the improvement of logistics service level means the increase of logistics costs. There is trade-off between the two of them.

(2) "Trade-offs" among logistics activities. For example, there is trade-off between transportation cost and warehousing cost. The increase of product storage means the further simplification of the transportation link, it will shorten the transportation distance, reduce the time that enterprises respond to their customers, and thus, decreasing the transportation cost of the logistics system.

2. Theory of "Service Is the Center".

It is some scholars' understanding about logistics in some European countries and the U.S.A. This theory holds that the biggest effect of logistics activities does not lie in saving consumption, reducing cost or increasing profits for enterprises, but in

improving the service level of the enterprises to satisfy the customers' requirements and further enhancing the competencies of the enterprises.

As far as the study and research in logistics cost is concerned, there is still a big gap between China and the overseas developed countries, since the proportion of logistics cost in the developed countries' GDP accounts for only about 10%, whereas in China, the proportion of total logistics cost in our GDP is estimated to be around 20%, which is astoundingly twice as much as it is in other countries. It should arouse our great attention to the study and research on it.

On the whole, since the total logistics cost in China today still remains appallingly high, we should assume the responsibility to carry out sufficient exploration and research into this area in order to find out ways to attack the existing problems, to improve our logistics mechanism, and to narrow down the gap between China and the overseas developed countries.

2.2. Basic Knowledge of Logistics Cost

I. The concepts of logistics cost

The understanding of logistics cost can be broadly undertaken into two kinds, i.e. logistics cost in its general sense, and logistics cost in its specific sense which is the tangible part that exactly draws people's attention.

In its specific sense, logistics cost refers to that sort of cost, expressed in terms of money or cash, paid by the enterprises to the active labor or materialized labor for the value employed or consumed in the process of the logistics movement or the supply of the logistics services, which constitutes the most important part in the composition of the logistics service value.

II. The basic components of logistics cost

As is states in the above, the total logistics cost is generally composed of two main parts, namely, logistics cost in its general sense which includes customer service cost and the costs incurred on the part of executive and administration management ; and logistics cost in its specific sense which is characterized by the following elements:

(1) The consumption of materials in logistics activities. (2) The reasonable wear and tear of materials used in logistics activities. (3) Labor cost in logistics activities. (4) Other costs incurred in logistics activities. (5) Capital cost for guaranteeing the smooth operation of the logistics system. (6) Costs for researching, designing, reconstructing and optimizing logistics process.

III. The classification of logistics cost

When managing logistics cost, enterprises more often than not consider the logistics cost in its specific sense and pay little attention to the cost incurred customer service. Therefore, the classification of logistics cost mainly refers to the logistics cost in its specific sense.

1. Classification of logistics cost according to economic contents, including:

(1) Depreciation of fixed assets. (2) Material cost. (3) Fuel cost. (4) Overhead expenses. (5) Interest charges. (6) Taxation and (7) other costs

2. Classification of logistics cost according to its functions, as:

(1) Transportation cost; (2) processing cost; (3) distribution cost; (4) packaging cost; (5) handling cost and (6) inventory cost

Among many classifications of logistics cost, the most widely accepted classification

is that: ***logistics cost = inventory cost + transportation cost + other costs***. Especially currently, for the unification of standard, logistics cost is unanimously divided into inventory cost, transportation cost and administration cost. China Federation of Logistics and Procurement also adopts the above division method when they collect the logistics statistics, that is ***logistics cost = inventory cost + transportation cost + administration cost***.

2.21. Inventory Holding Cost

"Inventories are stocks of goods and materials that are maintained for many purposes, such as resale to others, use in a further manufacturing or assembling process, investment, or for the operation or maintenance of the existing equipment." (James C. Johnson, Donald F. Wood, Daniel Wardlow, Paul R. Murphy, 1998, P300). Larson and DeMaris use the term *psychic stock* to refer to "retail display inventory carried to stimulate demand." (Paul D. Larson, Robert A. DeMaris, 1990, P30)

Inventory holding cost is the cost related to the quantity of stocks.

> The largest cost element of inventory holding cost will normally be the cost of capital. The other costs that need to be included in the inventory holding cost are the costs of storage and handling, obsolescence, deterioration and pilferage, as well as insurance and all the administrative costs associated with the management of the inventory. (Martin Christopher, 1998, P102)

Robert V. Delaney explained in his report that inventory holding cost included warehousing cost.

"Warehousing is the storage of goods. Broadly interpreted, this definition includes a wide spectrum of facilities and locations that provide warehousing." "By using

warehousing, companies can make goods available when and where customers demand them."(John J. Coyle, Edward J. Bardi, C. John Langley, Jr., 2002, P285)

Warehousing cost is the cost for constructing, purchasing or hiring warehouses, and the cost of activities happening in the warehouses.

2.22. Transportation Cost

Different transportation modes mean different transportation costs. According to transportation modes, transportation cost can be generally divided into railway transportation cost, roadway transportation cost, waterway transportation cost, pipeline transportation cost, and airway transportation cost.

2.23. Other Costs in Logistics Activities

It is true that inventory holding cost and transportation cost are the two main parts in the total logistics cost, but there are still some other costs incurred in the logistics activities such as management cost, customer service cost in its general sense, and so on, which cannot be overlooked.

As regards the logistics cost in its broad sense, which means the cost incurred on the part of the customer service, it is usually recessive, intangible from the total logistics cost, in line with the incurrence of loss of sale when the logistics service level fails to satisfy the customer's requirements. This type of cost has its effect on such elements as to how the customer feels about the services provided by the logistics firm, to what degree the customer is satisfied with the firm, and whether the customer will ultimately have his/her faith and trust in the firm.

The ultimate goal of the logistics system is to satisfy the customer by offering him/her

appropriate logistical services. In logistics management, the concept of being “Right” is certainly very important because the improvement of the logistics service level will also, very likely, add up to the increase of the logistics cost at the same time which well demonstrates the paradoxical relationship between the cost of customer service and the actual logistics cost in its narrow sense (Sun Chaoyuan, 2005 P194).

In contrast to inventory holding cost and transportation cost which are obviously seen and physically calculated as the two main constituents of the totality of logistics cost, management cost is only relatively too general and even a bit ambiguous as the term itself shows. The cost of executive logistics management in the United States is calculated on the basis of the total logistics cost, of which it accounts for 4% of the total, as seen in the following formula:

Cost of Executive Logistics Management == (Inventory holding Cost + Transportation Cost) ×4%.

This figure 4% is a value drawn from the actual experience in logistics practices in conformity with the current situation in the United Stats. Nonetheless in China, there is not yet any specific accounting method or standard meant for the calculation on the cost of logistics management in its real sense. Due to the limitation of space of this dissertation and capability of its author, the discussion will not stay on here but proceed to the contrastive analysis on the substantial and tangible inventory holding cost and transportation cost.

Chapter 3 A Contrastive Analysis on Inventory Holding Cost between China and Developed Countries (and Some Defects of Warehousing Practice in China)

3.1. Inventory Holding Cost

"Every product manufactured, grown, or caught is warehoused at least once during its life cycle (from creation to consumption)." (John J. Coyle, Edward J. Bardi, C. John Langley, Jr., 2002, P285) In the warehousing process, the act of holding inventory occupies the capital that can be put into other investments, thus becoming the cost of capital which belongs to the opportunity cost. Accompanied with the cost of capital, the warehousing cost such as the cost of loading and discharging products, the cost of carrying and picking goods happens. As is referred to in the above chapter, warehousing cost is contained in the inventory holding cost, so when managing the stocks in the warehouses, the inventory holding cost comes out.

3.2. A Contrastive Analysis on Inventory Holding Cost between China and Overseas Countries

Inventory holding cost is an important part of the total logistics cost. Effectively cutting down the inventory holding cost can largely improve the logistics service level. The normal practice many developed countries have undertaken is to reduce the total logistics cost by bringing down the inventory holding cost.

Take the U.S.A as an example, the total logistics cost in the U.S.A is composed of three parts: inventory holding cost, transportation cost and administration cost. (Qin Xiaoyan, Xiao Quanfang, 2006, P62) Generally, up to 2001, the total logistics cost of the U.S.A is decreased by 40% in which the inventory holding cost was reduced by 60%. Obviously, the improvement of efficiency of the inventory management is the

most major driving factor for the improvement of the efficiency of the logistics system in the U.S.A. Robert V. Delaney, one of the writers of the annual *State of Logistics Report* of the U.S.A. emphasized in his report that anyone who took on the career in logistics management should pay due attention to stock capital and should be always curious about the inventory. (Zhang Hong, 2004, P17)

As shown in Table 3.1, the statistical figures, taken from the reports provided by Mitsubishi Firm, a Japanese company, demonstrate that, by means of sampling a group of items in retailing lines, we are made aware that the cost of inventory holding in China is still relatively higher than that in Japan:

Table 3-1 Inventory Holding Cost in Retailing Lines in Japan and China

Year (2004) China	Inventory Holding Cost	Total Logistics Cost	Unit Price (Yuan)
Food (Fast Noodles)	0.24 Yuan/pack	0.69 Yuan/pack	4
Garment (Shirts)	9.57 Yuan/piece	27.62 Yuan/piece	160
Tobacco (Cigarettes)	0.72 Yuan/pack	2.07 Yuan/pack	12
Telecom (Cell Phones)	89.70 Yuan/set	258.90 Yuan/set	1500
Home Appliance (TV)	227.24 Yuan/set	655.88 Yuan/set	3800

Average Value	65.49 Yuan/per unit		189.03 Yuan/per unit		
Year (2004) Japan	Inventory Holding Cost	Conversion (Yuan)	Total Cost	Conversion (Yuan)	Unit Price (Yen)
Food (Fast Noodles)	9.6 Yen/pack	1.37 Yuan/pack	26.06 Yen/pack	3.72 Yuan/pack	26.0571
Garment (Shirts)	48 Yen/piece	6.86 Yuan/piece	130.29 Yen/piece	18.61 Yuan/piece	130.286
Tobacco (Cigarettes)	12 Yen/pack	1.71 Yuan/pack	32.57 Yen/pack	4.65 Yuan/pack	32.5714
Telecom (Cell Phones)	624 Yen/set	89.14 Yuan/set	1693.71 Yen/set	241.96 Yuan/set	1693.71
Home Appliance (TV)	720 Yen/set	102.86 Yuan/set	1954.29 Yen/set	279.18 Yuan/set	1954.29
Average Value	282.72 Yen/per unit	40.39 Yuan/per unit	767.38 Yen/per unit	109.63 Yuan/per unit	767.383

Source: Reports Taken from Mitsubishi, 2007

From the above table, we can see by contrast that Chinese inventory holding cost in retailing industry is about 65.49 yuan/piece while the Japanese inventory holding cost is much lower at around 40.39 yuan/piece.

Nevertheless, the above data only illustrates the inventory holding cost in retailing industry which can not be taken as having reflected the inventory holding cost of the whole logistics line.

Table 3.2 down below shows the return on net assets of warehousing industry in both the U.S.A and China:

Table 3-2 Returns on Net Assets in Warehousing Industry in U.S.A. and China in 2003

Return on net assets	The U.S.A.	China
Warehousing companies	7．1%	2．5%

Source: China Logistics Year Book, 2006, P309, 257

In 2003, the return on net assets of the U.S. warehousing industry is 7.1% based on the statistics of the U.S. logistics industry. However, from 2002 to 2004, China Federation of Logistics and Procurement conducted investigations by sampling 41 warehousing companies as the targeted subject and came out with the statistics which showed that in 2002, the return on net assets of these 41 targeted companies was about 2.1% on average, 3.6% in 2003 and 1.7% in 2004, so that the average return on net assets of the warehousing industry in China can be estimated at about 2.5%. (*China Logistics Year Book*, 2006, P309) the return on net assets can be calculated on the basis of the formula: **RONA= (net sales – operating cost – tax) ÷ net assets.** According to this formula, the return on net assets is highly correlated with the operating cost, that is, the higher the cost is, the lower the return on net assets. The fact that Chinese RONA of warehousing enterprises is far lower than that of the USA shows that Chinese inventory holding cost is very high. The reason for that is to be explained by the fact that much investment on assets is offset by extortionate

warehousing costs, thus leading to the decrease in profits in the Chinese warehousing industry.

The comparison between the data of RONA in the U.S. and Chinese warehousing industry indirectly reflects that the inventory holding cost of Chinese warehousing line is far above that of the U.S.A. From the following two tables, Table 3-3 and Table 3-4, the current situation of high cost of holding inventory in China can be shown more directly.

Table 3-3 Proportion of Inventory Holding Cost in GDP in the U.S.A. from 1991 to 2001

Year	Nominal GDP $ Trillion	Inventory Holding Cost $ Billion	Inventory as a % of GDP	Logistics Total Cost $ Billion	Logistics Total Cost as a % of GDP
1991	5．99	2560	4.3	6350	10.6
1992	6．32	2370	3.8	6360	10.1
1993	6．64	2390	3.6	6600	9.9
1994	7．05	2650	3.8	7120	10.1
1995	7．40	3020	4.1	7730	10.4
1996	7．81	3030	3.9	8010	10.3
1997	8．32	3140	3.8	8500	10.2
1998	8．79	3230	3.7	8840	10.1
1999	9．30	3320	3.6	9220	9.9
2000	9．96	3770	3.8	10030	10.1
2001	10．21	3280	3.2	9700	9.5

Source: Robert V. Delaney, “State of Logistics Report”, 2002, at the National Press Club in Washington D.C., Cass Information Systems.

Table 3-4 Proportion of Inventory Holding Cost and Total Logistics Cost in GDP

Year	Inventory Holding Cost ￥ Billion	Inventory as a % of GDP	Logistics Total Cost ￥ Billion	Logistics Total Cost as a % of GDP
1991	161.2	7.5	518.2	24．0
1992	192.2	7.2	613.7	23．0
1993	231.7	6.6	789.8	22．4
1994	327.6	6.8	1033.8	21．4
1995	445.9	7.3	1288.4	21．2
1996	510.9	7.2	1499.3	21．1
1997	582.0	7.4	1666.7	21．1
1998	562.5	6.7	1702.1	20．2
1999	534.4	6.0	1781.4	19．9
2000	597.5	6.0	1923.0	19．4
2001	645.8	5.9	3061.9	18．8

Source: “China Logistics Year Book”，2006 , P181, 188-191

By comparing the above two tables, we can see that the proportion of the total logistics cost in the U.S. GDP was about 10% in which the inventory holding cost occupied 4%. In contrast to what happened in the U.S.A, the proportion of the total logistics cost in the Chinese GDP was around 20% in which the inventory holding cost accounted for about 6%. It is true that in recent years, our country has been making endeavors to bring down inventory holding cost and to improve inventory management level, but the inventory cost still remains very high.

Inventory holding cost can be manifested by inventory time. The longer time the stocks take in inventory, the lower level the warehousing service is. Table 3-5 below indicates the product inventory days both in some developed countries and in China.

Table 3-5 Comparison of Inventory Holding Time between China and Some Developed Countries

Enterprises	China	Abroad
Inventory holding time	34-35 days	<10days

Source: Li Yisong, Yi Hua, 2005, P25

From this table, we can sum up that the average inventory holding time of the Chinese companies is 34-35 days while the inventory holding time of the companies in some developed countries is generally less than 10 days. This is the comparison that can speak well for itself. Surveys show that in China, the inventory period of raw materials in manufacturing enterprises keeps at a cycle of 20 days, the average inventory time of finished products is about 51 days, and the sales inventory period of business enterprises is approximated to 34 days. This well illustrates the current situation in China characterized by long time in inventory and slow inventory turnover which is to be taken note of.

Inventory turnover is a measurement on how well a company's products are doing in the market and how well its inventory is managed. The fewer days inventory takes, the quicker the company is able to push its inventory out the door. For example, DELL Company's inventory holding time is only 5 days at most. One of the most famous features of DELL operation is its high speed: manufacturing its products fast, selling its goods fast and making profits fast, that is "Speed determines everything."

(Chen Jia, 2003 P38)

DELL Company's core competence lies in its unique operational mode: "Just-in- time (JIT)", which can help the company to cut down its finished goods inventory to the greatest extent.

In order to bring its competitive advantage into full play, DELL Company especially emphasizes the key link in the whole manufacturing and distribution processes and even requires its spare-part suppliers to store their goods in the warehouses which are near DELL's factories so that when stock is out, DELL Company can quickly replenish the stock, thus reducing greatly the stock-out cost. By adopting these measures, DELL Company has achieved the goal of "Just-in-time" on the whole.

The method of "Just-in-time" is not only widely used in the U.S.A and Japan, but also widely spread throughout Europe and Australia. For instance, in Germany, the Porsche Company, which was established in 1930, could not hold its leading position in automobile market after going through the great prosperity in 20th century. However, ever since Porsche Company introduced the method of "Just-in-time", it has benefited greatly from JIT. Table 3-6 shows by means of various indexes that Porsche Company has been changing for the better since it introduced the JIT approach.

Table 3-6: Changes of Different Indexes after Using JIT in Porsche Company

	1991	1993	1995	1997
1. Time				
From design to production	7 years	----------	----------	3 years
From welding to finishe	6 weeks	----------	5 days	3 days

d goods inventory				
2. Inventory holding time	17	4．2	4．2	3．2
3. Working hours	120	95	76	45
4. Defect index				
Supply from suppliers	100	40	10	1
Cars from the production line	100	60	45	25
5. Sales Volume (million Mark)	3120	1913	2607	----------

Sources: http://www.chinafm.org/Opinion/view_4_20989.html

It is worthwhile to mention that Porsche Company reduced its inventory holding time from 17 days to 3.2 days in 1997, which is almost 10% of the average inventory holding time of our country's enterprises now.

But why is the inventory holding cost running so high in China? Why does the stock take such a long time in inventory in the Chinese warehouses? We have reason to believe that all these are caused by the backward warehousing industry in China. In the following part we will elaborate the possible causes leading to the high cost of inventory in China.

3．3. Possible Causes Leading to High Cost of Inventory in China

As is stated clearly in the above, in comparison with the logistics industries in some developed countries, the inventory holding cost in China is too much higher. The statistics exhibited in the previous chapter have also indicated that the inventory holding cost in the United States only occupies 4% in the country's GDP while the

proportion of inventory holding cost in the Chinese GDP is around 7%. The stocks in Chinese warehouses take longer time in inventory than that of the developed countries. Very few Chinese companies can reach the goal of "Just-in-time" in inventory management like DELL Company in the U.S.A and Toyota Company in Japan.

The root causing such problems lies in the backwardness of the logistics facilities, the scattered management, the small-scale warehousing enterprises, low-quality of employees, lack of supply chain integration and communication among the enterprises in the supply chain. It is true that the inventory management level and efficiency is relatively low in China but the space for saving inventory holding cost is very large. Only when using modern technology in inventory management and decreasing the inventory holding cost, can the warehousing industry make a success.

Let us first refer to a case:

> A large famous manufacturer(corporation) of electric appliances, located in south China, has over 20 finished-product warehouses around it, covering approximately 200,000 square meters, and 4 or 5 raw material warehouses, covering 80,000 square meters; and those two kind of warehouses have a monthly inventory of RMB 2 billion yuan on average. This parent corporation has about 30 subsidiaries and each of them has set up a warehouse of 10, 000 square meters or so in the provincial capitals and some large-or-medium-sized cities. Thus, the total surface area of all its warehouses throughout China is approximately 600,000 square meters, with a total monthly rent of about RMB 7 million yuan. Compared with the enormous surface area of its warehouses, however, the management over all its warehouses is inefficient. In the aspect of

hardware facilities: all its warehouses are simple and crude single-storey houses without loading-and discharging platforms or mechanical equipment; there are no evidently delimited storage areas in each warehouse and such facilities as firefighting, illumination and extractor ones, etc are not fixed according to the standard warehouse. In the aspect of management and other software facilities: the management of the stock is operated by hand instead of the information system; at present all the account volumes are recorded by hand and therefore there is basically no stock analysis and control; the storage of the products has no rules; for example, the same type of products may be scattered in several neighboring warehouses, so to load all the products needed by the orders one has to go to several warehouses. The transfer warehouses distributed throughout China are all managed independently by the subsidiaries. Owing to bulk stock, every subsidiary rents comparatively large warehouses of the State-owned warehouse corporations, which manage inefficiently and which, basically, are only in charge of recording the in and out of the products but don't supply any supplementary services (such as the warehousing analysis and control and distribution service, etc) Some of the stored products in the warehouses are unmarketable or exchanged ones. The liaison of the warehouses all over China through the Internet is just an illusion. Since the warehouses cannot provide the distribution service, the distributors of other places have to go to the warehouses on their own to take the products. To do so, the distributors have to arrange vehicles by themselves, take only a whole truck of products each time and therefore pay a larger amount of money; so the degree of the distributors' satisfaction is comparatively low. (He Hongming, 2002, P20)

Indicated by the above-mentioned case, the situation of China's warehousing management is apprehending and compared with the warehousing management of the

developed countries, China has a long way to go. Early in the 1960s, Japan has realized the automation of warehousing management while up to now; quite a few Chinese enterprises are still managing their warehouses by hand.

This paper reckons that the main causes for the low-level logistic storage of China are as follows:

3.31. Small-scaled warehousing enterprises and backward logistic infrastructure

In 2005, the State carried on an economic consensus and there is a new statistical conception about China's warehousing industry. In 2004, there are 10177 warehousing enterprises throughout China with an employment of 399,000, a total asset volume of 257.8 billion yuan, an amount of obligation of 179.14 billion yuan, and the proprietors' profits of 78.66 billion yuan.
(Ding Junfa, 2006, http://www.56885.net/lw_view.asp?id=7015)

As a whole, China has a large number of warehouses. In the above content I just mentioned those of the logistics departments; if plus those of the industrial departments, the total surface area of all the warehouses will be surprisingly huge. The root cause of the present situation is shortage economy under the system for the planned economy, i.e., to guarantee the continuum of the production, it is essential to have bulk storage and subsequently large warehouses. On one hand, there are lots of warehouses; on the other hand, in reality, large amounts of money is invested in the construction of new warehouses—in 2005, the total volume of the infrastructure investment of the warehouses amounts to 35.6 billion yuan. What's the matter with it? First, the former warehouses are obsolete and backward and do not conform to the modern storage requirement; second, large numbers of warehouses of the manufacturing industry cannot be integrated and reorganized. Under such

circumstances, the influx of the foreign investment started China's logistic real estate. Seeing the perspective of the warehousing industry, farmers also put themselves into the construction of the warehouses. Therefore, the warehousing industry is full of fierce competition, which brings about the decrease of its profit rate. Though the total surface area of the warehouses increases, fewer ones conform to the standard requirement. This is the reality of China's warehousing industry.

There is a general phenomenon that China's State-owned warehouses are "small but complete", i.e., small-scaled enterprises carry on large amounts of businesses without analyzing whether they have the ability to undertake all those and the result is the increase of the their inventory holding cost. Indicated in some statistical materials, the United States of America established a Storehouse Association early in 1966; in 1998, among the warehouses of all the members of the Storehouse Association, 5% were specially in charge of storing raw materials, and 50% were in charge of finished products; in addition to the business of loading and discharging of the everyday necessities, the Storehouse Association also did the following businesses on others behalf: restoring (82%), pallet exchanging (80%), local assembling and distribution (78%), packing (46%), state-to-state transporting (49%). (Liu Beichen, 1998, P30) China's storehouse enterprises haven't such distinct labor division; on the contrary one enterprise carries on all the business. Besides, they lack corresponding management and restraint, unlike the Storehouse Association, whose business activities are restrained according to Chapter 7 of "The Basic Law for the Common Warehouses".

The infrastructure of China's storehouses lags behind. Shown in the abovementioned case, a most of the warehouses of China' enterprises, especially those of the State-owned logistic enterprises and many small-scaled logistic ones, are simple and crude

single-storey houses; the goods are casually placed in the warehouses and there are no distinctly delimited areas.

According to the investigation by the China Association of Warehousing and Storage in 2001 to the facilities and equipment in the logistic enterprises, the author finds:

Table 3-7: Causes that warehouses cannot satisfy demand

Items	Inadequate number	Aging	Backward technological installation	Non-conformance to clients' special demand	Shortage of special operators	High operation cost
%	18%	19%	16%	13%	2%	8%

Source: the Secretarial Department of the China Association of Warehousing and Storage, 2001.

Shown in Table 3-7, the inadequacy of the total number of the facilities and the low application rate co-exist and this demonstrates the imbalance of the application, besides, the technological installation of the warehouses lags behind and the facilities become aging; all those prevent the storage cost from decreasing.

The author, when having an internship in a subsidiary of a famous corporation in Baoshan, found that the storehouse management of this subsidiary was rather inefficient: a simple and crude single-storey house, four or five storekeepers, several forklifts, worn-out wood or plastic pallets, the goods were randomly placed and there were no advanced operation equipment, such as goods conveyer belts, piling machines, unmanned forklifts, etc. This is the features of the whole warehouse. Such hi-tech as Bar-code，JIT、"Kanban" management、First-in-first-out and RFID which prevail in foreign countries, were not applied in the warehousing management here. On the contrary, the German Volkswagen Automobile Corporation has realized zero

storage by adopting JIT. According to some statistics and analysis of Germany, at present, the inventory holding cost of Germany's production enterprises has decreased by 4% through efficient and timely supply. (the Information Department of China Federation of Logistics and Procurement, 2004, http://www.chinawuliu.com.cn/oth/content/200407/200414158.html)The USA and Europe start to apply RFID in the fields of transportation, vehicle management, identification, automatic control of the assembly lines, inventory management and materials tracking, and so on. In the aspect of logistics, over 100 enterprises of the USA have promised to support the application of RFID, including Wal-Mart, JOHNSONS、P&G and Federal Express. Wal-Mart has made great achievements by applying RFID/EPC; up to 2005, it has reduced 16% shortage of stocks and 10% handwritten orders. While most of Chinese enterprises are still looking on; by the end of December, 2005, EPC global China has only developed 9 Chinese members.(China Logistics Year Book, 2006, P568)

3.32. Lack of IT system in warehousing management

The Logistics hardware equipment is like the body of human beings while the logistics software solutions will be like the wisdom and sole of human beings. The combination of sole and flesh consists of a person. Similarly, it is not enough to just rely on logistic equipment to establish an advanced logistics system and to improve the logistics management; neither is it sufficient to just apply a simple EXEL to the warehousing management.

Today, many Chinese enterprises, especially those small-and medium-sized ones, are featured by backward logistics equipment and lack of information system. Some enterprises in Quanzhou have no forklifts, no pallets, on conveyer belts except their employees' hands. Is it really just the distance between ideal and reality? What are the

real causes?

Many enterprises haven't adopted the all-round and consistent analysis and inventory policy programs because of shortage of time and information.

Indicated in some statistical data, at present, among 10 million small-and-medium-sized Chinese enterprises, the proportion of those which has information system is less than 10%; even some are still making all the operations by hand. The most distinct defect of the small logistic enterprises is non-information. The author had the same feelings after investigating and studying several manufacturing enterprises in Quanzhou. For example, Baofeng, China's biggest slipper manufacturer—one of ten Americans wears Baofeng slippers, has no forklifts and the stocking of its finished products does not conform to the standard requirement. The distributor of KODAK in Quanzhou has only several garages as its so-called warehouses, and the stocking of its products has no rules so that when the headquarters came to check its inventory, its employees had to move the products one box after another.

Having visited those enterprises, the author feels that the cause is not because they haven't advanced logistics equipment or forklifts but because they haven't a good inventory information system. The reasons that the enterprises are unwilling to develop a good storage information system lie in:
(1). The leaders ignore the inventory and consider it unnecessary to set up a logistics department.

All the leaders of the enterprises focus their attention on the sales and production, and consider that it is necessary to make profits by selling more products and saving the production cost so they neglect logistics, not to mention inventory.

With the process of the warehousing operation, a large amount of information emerges in a warehouse. Once these kinds of information cannot normally flow, the warehousing operation will be influenced to bring about many problems. The computer information system for the warehousing management is considered to be an important method to increase the working efficiency, reduce the inventory and improve service.

(2). Little money will be spent in developing or purchasing an information system, but to connect such a system, the whole enterprise's system will be influenced, involving too many departments' interests.

Most of the enterprises, when dealing with their demand of information system, just unilaterally solve the partial problems of a certain logistics link, not considering the solutions from the angle of the whole logistics system; as a result, the developed software programs are incompatible with each other and cannot realize the unit and harmony of the whole system. Although there are software system supporting the operation and improving the automation of the logistics operation in each part, each link exists independently and therefore information cannot flow fluently between the logistic web platform of the whole enterprise and those various links. As a result, the information system doesn't improve the whole automation so as to reduce the business efficiency.

(3). The advantages of the present information system can be replaced with the low-priced laborers; the present employees have a low cultural quality and need training.

According to the statistical data investigated in over 60 warehousing enterprises: the

enterprises possess a large number of employees with low-level educational background; in terms of their educational backgrounds, there are 51 who obtained Master's degree, accounting for 0.2%; 3267 who graduated from colleges and universities, accounting for 13%; 21300 who graduated from secondary or senior high schools, accounting for 86%. With respect of age composition, there are 12500 who are 40 years old or above, accounting for 51%; 8662 who are 30 to 40 years old, accounting for 35%; 2451 who are under 30 years old, accounting for only 10%. (China Logistics Year Book, 2006, P256).

3.33. Insufficient supply chain integration and slow development of third party logistics

It is believed that the warehousing management is just the management over the warehouses and that by improving the infrastructure of the warehouses and strengthening their information system construction, the situation of high inventory holding cost in China will be changed. As a matter of fact, this is a misconception. Inventory is a significant link in the supply chain because warehousing always appears at the joint part of various links, such as that between purchasing and producing, between the preliminary and refined processing, between producing and selling, between wholesale and retail, and between the transformations of various transportation ways, and so on. Warehousing is manifestation of imbalance in various links while inventory is the method of solving that imbalance. All the contradictions in the integration of the upstream and downstream of the supply chain emerge in the link of warehousing and inventory management is realizing the integration of the supply chain.

In the former case of the famous manufacturer in south China, we see that the transfer

warehouses throughout China are all managed independently by the subsidiaries. Because of that, it is hard to promptly reflect to the parent corporation the situation of all the subsidiaries; the parent corporation couldn't deal with the information of various places and all the subsidiaries demand different volumes of electric appliances parts; meanwhile, they must guarantee their storage volume above the safety inventory. In this case, the same type of products may be distributed in several neighboring storehouses, so all the subsidiaries need to place large numbers of orders to avoid the shortage of goods; thus there will appear repetition and surplus of goods in the warehouses. If the suppliers and manufacturers couldn't integrate efficiently, there would be overstock of goods and a great waste—waste of storing and maintenance fees; and the value of the goods will depreciated with the time to finally bring about high storage cost.

3PL will be helpful to raise the logistics level of the enterprises, to reduce inventory and the depreciation expenses of the products because of time. According to the statistics by the Northwest University of the USA, 3PL will be useful to reduce the cost by 40%, increase the logistics services by 60% and decrease the logistics employees by 50%, compared with the logistics by the enterprises themselves.

3PL emerged in the USA in 1970s. In 1997 the application rate of 3PL in the major American markets amounted to 73%, and 16% enterprises expressed to apply 3PL in the future; so the total percentage is 89%. At present, the market scale of Logistics in the USA is approximately 460 billion dollars, of which that of 3PL was about 50 billion dollars in 2000, accounting for 11% of the total market. (Jiao Wenqi, 2004, P162) However, among China's enterprises, only 18% handed the management of raw material to 3PL, and only 16% handed the management of sales logistics to 3PL.(Yuan Jiangyun, Zheng Quan, 2003, P179)

Here is an example about the changes of logistics cost of an electrical household appliances manufacturer (called the company in the following) in Hubei Province since the company adopted the third party logistics service.

The company, before applying the third party logistics, adopted the delivery mode which integrated business flow and material flow. To meet sales demands, the company built seven warehouses in Hubei Province. Under such mode, the company could not clearly get the product information in logistics activities once the product came out of the parent company. Because of the long response time to customers' requirements, every branch company, to avoid the shortage of goods, stored a lot of products of every specification and type without considering whether they are in great demand or not. Large quantity of stock makes it possible that the market demands could not be precisely predicted. With the changing of market demands, goods previously in large demand gradually became unmarketable or even out-of-date, however, the parent company, without knowing the change, continued producing them, which resulted in large production of goods out of dates but non-production of goods in great demands that should be produced. Finally, when the company realized new demands and readjusted strategies, goods in every warehouse are piled up mountain high. Therefore, the company had no alternative but to adopt sales promotion measures to reduce the price, causing huge economic loss.

Considering the demerits of the delivery mode above, the company decided to adopt third-party logistics delivery mode. According to the plan designed by the third-party logistics, the original seven warehouses were all canceled while only one distribution center was set up in Hubei Province. All the delivery

requirements were supplied by the distribution center. Barge transportation, one of the logistics management was frequently used for transporting goods in great demands.

The statistics show that the company, after adopting the third party logistics distribution strategy, greatly reduced the inventory holding cost in Hubei, with total cost reduced by 48.74%. (Guo Qing, 2002, P2-6)

Chapter 4 A Contrastive Analysis on Transportation Costs between China and Developed Countries (and Some Defects in Transportation Industry in China)

4.1. Concepts of Transportation Cost

It is true that the role inventory management plays in the entire logistical practices is so important that many firms have been striving for the best possible ways to bring down the inventory cost, but the cost of transportation is equally important that cannot be overlooked since transportation cost and inventory cost are the two main categories that constitute the total logistics costs. Functioning as one of the leading factors in the whole logistics system, transportation has its main goal of transferring goods from one place to another at the lowest possible cost and loss, therefore, the analysis and study on the cost incurred in transportation process is of great significance.

4.2. A Comparative Analysis on Transportation Cost between China and some Overseas Countries.

The following statistical figures taken from the reports provided by Mitsubishi Firm, a Japanese company, demonstrate that, by means of sampling a group of items in retailing lines, the cost of transportation in China is still relatively higher than that in Japan:

Table 4-1: Comparison of transportation cost of retailing industry between Japan and China

Year (2004) China	Transportation Cost	Total Cost	Unit Price (Yuan)
Food (Fast Noodles)	0.45 Yuan/pack	0.69 Yuan/pack	4

Garment (Shirts)	18.05 Yuan/piece		27.62 Yuan/piece	160	
Tobacco (Cigarettes)	1.35 Yuan/pack		2.07 Yuan/pack	12	
Telecom (Cell Phones)	169.20 Yuan/set		258.90 Yuan/set	1500	
Home Appliance(TV)	428.64 Yuan/set		655.88 Yuan/set	3800	
Average Value	123.54 Yuan/per unit		189.03 Yuan/per unit		
Year (2004) Japan	Transportation	Conversion (Yuan)	Total Cost	Conversion (Yuan)	Unit Price (Yen)
Food (Fast Noodles)	14.4 Yen/pack	2.06 Yuan/pack	26.06 Yen/pack	3.72 Yuan/pack	26.057
Garment(Shirts)	72 Yen/piece	10.29 Yuan/piece	130.29 Yen/piece	18.61 Yuan/piece	130.29
Tobacco (Cigarettes)	18 Yen/pack	2.57 Yuan/pack	32.57 Yen/pack	4.65 Yuan/pack	32.571
Telecom (Cell Phones)	936 Yen/set	133.71 Yuan/set	1693.71 Yen/set	241.96 Yuan/set	1693.7
Home Appliance(TV)	1080 Yen/set	154.29 Yuan/set	1954.29 Yen/set	279.18 Yuan/set	1954.3
Average Value	424.08 Yen/per unit	60.58 Yuan/per unit	767.38 Yen/per unit	109.63 Yuan/per unit	767.38

Source: Reports Taken from Mitsubishi, 2007

The survey by means of sampling given in the above shows that the transportation cost in retailing business in China approximates to RMB￥123.54/per unit, while in Japan it amounts to Japanese ￥ 60.58/per unit, which is nearly 1/2 of the transportation cost in China.

But these data can not reflect the transportation cost of the whole logistics industry. Next table is about the RONA of transportation industry both in the U.S.A and in China.

Table 4-2: RONA of transportation industry both in the U.S.A and China

Transportation Companies	US	China
Return on net assets	8．3%	1%

Source: from *China Logistics Year Book,* 2006, P309.

Analytical results done on the basis of the statistical figures demonstrate that the logistics enterprises in the US which are mainly engaged in transportation business yield an average return rate up to 8.3% whereas in China, most of the corresponding logistics companies only have their average return rate in the vicinity of 1%, which expresses the fact that transportation industry in China is suffering from high costs and serious wastefulness. To make the matter even worse, many transportation enterprises in China currently are the ones transformed from their former corporations' vehicle service departments, which are often of a relatively small scale and limited capacity to handle large volumes of business. Worse still are that the practices and processes of transportation in China presently are made even more complicated by the existence of too many agencies involved in the transportation line

which only aggravates the situation resulting in the undesired increase of the transportation costs.

Statistics show that up to the year 2001, the total logistics cost in the United States had decreased by 40%, among which the cost of transportation had been reduced by approximately 22%, as is exemplified in the following table the relationship between the logistics cost and the GDP in the US commercial system in each of the concerned years during the decade 1991~2001

Table 4-3: Proportion of transportation in GDP in the U.S.A

Year	GDP $ Trillion	Transportation Cost $ Billion	Proportion of transportation cost in GDP (%)
1991	5．99	3550	5.9
1992	6．32	3750	5.9
1993	6．64	3960	6.0
1994	7．05	4200	6.0
1995	7．40	4410	6.0
1996	7．81	4670	6.0
1997	8．32	5030	6.0
1998	8．78	5290	6.0
1999	9．37	5540	6.0
2000	9．87	5900	5.9
2001	10．21	6050	5.9

Source: form Liu Jinming and Wang yaoqiu, 2002, P10

By contrast, the ratio between the total cost of societal logistics and the GDP in China

during the same decade can be seen in the following table:

Table 4-4: Proportion of transportation cost in GDP in China

Year	Transportation Cost	Proportion of transportation cost in GDP	Total logistics cost	Proportion of total logistics cost in GDP
1991	2879	13．3	5182	24．0
1992	3379	12．7	6137	23．0
1993	4507	12．8	7898	22．4
1994	5579	11．6	10338	21．4
1995	6455	10．6	12884	21．2
1996	7633	10．7	14993	21．1
1997	8218	10．4	16667	21．1
1998	8668	10．3	17021	20．2
1999	9533	10．6	17814	19．9
2000	10070	10．1	19230	19．4
2001	10813	9．9	30619	18．8

Source: from *China Logistics Year Book,* 2006, P191.

By comparing the two tables provided above, we can see clearly that the proportion of transportation cost in GDP in China is much higher than that of the United States. Since transportation cost is the second largest share in the totality of logistics costs, it is all the more urgent for China to search for effective ways to bring down the costs incurred in the transportation processes.

Glancing through a great many successful examples of the overseas transportation

enterprises, we can find that Wal-Malt, the world's largest retailer corporation in the United States, is quite unique in the practice of reducing their transportation costs, which deserves our study and reference. It turns out that Wal-Malt makes a good use of large-scale container-trucks or vans, trying always to have them fully loaded with cargoes whenever it can. Possessing more than 3700 drivers, Wal-Mart's fleet of trucks can handle its one–lot cargo transportation amounting to 7000~8000 km per week (Huang Fuhua and Yuan Shijun, 2003 P133). And each and every driver is required to observe the principle of "Safety and courtesy are the most important", making sure that the transportation is smooth and free from road accidents. With the adoption of the GPS System for positioning and monitoring the whereabouts of its vehicles, Wal-Mart's fleet of trucks can start out its transportation missions in the night from the places of shipment to their final destinations, which enables the company to collect cargoes in the afternoon, transport the cargoes in the night, and deliver the cargoes to the customers' door on the morning of the next day, thus making it possible that the whole transportation processes are to be completed within 15 to 18 hours. In addition, when Wal-Mart's container trucks reach the named place of destination, the whole cargo can be discharged in bulk, and the customer does not have to check and examine the product pieces one by one, which saves a lot time and energy. By adopting these approaches, Wal-Mart can accelerate its logistics circulation process and minimize the transportation costs.

Wal-Mart's Cargo Collection and Distribution Center has already integrated the above-mentioned measures into an organic whole and arranged them in the most cost-effective and appropriate manner so that its transportation fleet can be operated with high efficiency and with the costs reduced at the minimal level. It goes without saying that Wal-Mart's success manifests its professionals' wisdom and their painstaking efforts, which is worthwhile for the personnel engaged in the trade of transportation in China to learn and refer to.

The following table is the detailed classification of the transportation costs incurred in the United States between 2001 and 2002, which reports part of the status quo of the US logistics industry:

Table 4-5: Detailed classification of the transportation costs incurred in the United States between 2001 and 2002

Year	Truck transport (In City)	Truck Transport (Intercity)	Transport by Rail	Transport by Water	Transport by Pipe	Transport by Air	Total Cost
2001	1610	3330	380	280	90	240	9700
2002	3000	1620	370	270	90	270	9100

Source: From *Liu Jinming* and *Wang Yaoqiu*. 2004 P11

Based on the above table, the proportion of the cost of each transportation mode in the total logistics cost can be calculated accordingly in the following table:

Table 4-6: Proportion of the cost of each transportation mode in the total logistics cost

Year	Road Transportation	Railway Transportation	Waterway Transportation	Pipeline Transportation	Airway Transportation
2001	50．9%	3．9%	2．9%	0．9%	2．5%
2002	50．8%	4．1%	3．0%	1．0%	3．0%

The composition of the transportation costs in China is also classified and reported in *China Logistics Year Book* as shown in the following:

Table 4-7: Composition of the transportation costs in China

Year	Road Transportation	Railway Transportation	Waterway Transportation	Pipeline Transportation	Airway Transportation
2001	62．1%	12．2%	12．4%	0．6%	0．8%
2002	61．9%	12．3%	12．6%	0．6%	0．6%

Source: *China Logistics Year Book*, 2006, P193.

From the above three tables, we can see clearly that in both China and the United States alike, transportation by roadway plays obviously a predominant role in the entire transportation system, however, the costs of transportation by rail, water, air, and pipelines in the United States are basically close to one another, demonstrating the proportionality of the development of the transportation industry in the US with the four types of transportation modes developing evenly alongside with one another(transport by roadway apart), whereas in China, the costs of transportation by rail and water are approximately close to each other, but the costs of transportation by air and pipeline are much lower than that of the other three types of transportation modes, indicating that transportation by air and pipeline is not utilized very often in China by reason that pipeline transportation is unique in its scope, only usable currently for transporting liquid and gas materials and its function can be thus excluded, while air transportation bearing such disadvantages as being expensive in freight rate is not so maturely developed in China as it is in other developed countries like the United States who boast perfect air transportation systems with such giant players like UPS and DHL it them. The disproportional development of China's transportation industry with the cost of transportation concentrated on certain modes well exposes the fact that the multimodal transportation service in the country is far from being so perfect, having relied so heavily on the mode of roadway transportation

to move in small batches but high frequency certain cargoes which may have been as well done via waterway mode.

But what can be the fundamental reasons that multimodal transportation in China cannot be so well developed as it is in other developed countries in Europe and America? The author of the present thesis believes that the reasons can be boiled down to the point that there still exist many defects and discrepancies in the current transportation industry in China and she will proceed to explore this issue in detail in the following section.

4.3. Possible Causes Leading to High Transportation Cost in China

Transportation is functioning as the core player in the entire logistics system, the cost of which accounts for 40% of the total logistics cost; therefore it is the key factor influencing how the total logistics cost is composed. The author proper assumes that the development of multimodal transportation in China is retarded by the following problems:

4.31. Backward Infrastructure and Inadequate Transportation Conditions

Most developed countries enjoy sophisticated infrastructure facilities with regard to their highway, railway, airway and waterway networks, no matter whether it is with the United States of America who is characterized with its vast expanse of territory, or with Japan or Germany whose lands are relatively small and narrow. For Example, it takes just a single day to have certain cargo transported by express from the west coast to the east coast across the whole country of the US, one of the key factors underlying which is that the country has the sophisticated airway transportation system and the most advanced highway network which brings nearly all parts of the country into very close connections with one other. Statistics show that the funds devoted to logistics

infrastructure construction and development each year in the US represent about 20% of its GNP, among which 5% goes for transportation and communications, around 5% for computer systems, around 5% for warehouses, and the rest 5% for other related projects, (Jiao Wenqi, 2004, P163) which results in the efficient interconnections between seaway, railway, highway and airway transportations and the constant improvement of the infrastructure facilities and conditions of roads, ports, harbors and warehouses, etc. in the country.

Comparatively speaking, there is an unbalanced development in China between the increase of the transportation means and that of the transportation routes, as is witnessed by such phenomena as the serious congestions and traffic jams along the main roads, obstructed flow of traffic between urban and rural places, the slow progress of reform in the rail services which should have acted as the mainstay in the transportation industry, and the intolerably high freight rate of the airborne transportation, and so on. Statistical and demographical surveys show that by the year 2002, in accordance with the ratio between the territory and population in China, the density of our railway network was marked by 74.48 km per hundred square kilometers and by 0.55 km per ten thousand people, while the density of the highway network is displayed by 18.33 km per hundred square kilometers and by 13.64 per ten thousand people (Zhang Hong, 2004, P53), which not only fell behind the developed countries but also lagged behind some developing countries like India. What is more, transportation equipment and facilities in China are of very low grade and quality. For instance, the capacity of high speed and heavy loading is always regarded as an important attribute to railway modernization in today world, therefore, in European countries and Japan, trains generally travel at the speed of 160 km per hour with the maximal speed reaching 300 km per hour, whereas in China, even the passenger trains can only go by an average speed of 49.5km per hour. In terms of loading capacity, the

average totality of weight handling for freight trains in the United States is 5183 tons; in Russia, 3090 tons; but in China, it is just 2440 tons (*Reports on the Development of Modern Logistics in 2002 in China, 2002,P279-286*), which obviously becomes the "bottleneck" constraining the development of the multimodal transportation in China.

4.32. Shortage of Logistics Enterprises with Economies of Scale

Typical examples of the status quo of logistics enterprises in China can be found in Guangdong Province in the south part of the country, where logistics industry was launched the earliest, developed at the fastest speed and operated with the largest scale in China, among the other few provinces. Currently in Guangdong Province, there are seven large scale logistics companies whose warehouse areas (including container yards) put together only amounts to less than 1.2 million square meters, each enterprise can only share averagely less than 0.17 million square meters. The number of transportation vehicles of their own amounts to less than 6000, each of them averagely possessing less than 850 sets. Shenzhen City now has about 3000 officially registered logistics companies, excluding those whose haven't officially registered, those affiliated ones and those self-owned ones engaged in transportation business, which may exceed 10000 in number. However, the annual average income from the operational margins for each of them cannot be calculated beyond the figure of one million Yuan RMB. Statistical figures from the year 2004 show that presently, seen from the nationwide perspective, each logistics enterprise in China averagely possesses only two sets of transportation vehicles, whose scale is so miserably small as to be reckoned as tiny or mini firms(Zhao Yanlin, 2005, P126). In the year 2000, the annual business income for the US FedEx Company was US$200 billion which was 2.2 times as that of the total annual income from the logistics business in the City of Shanghai, revealing part of the logistics conditions in China characterized by three distinctions, namely, "small in size but many in number", "small business capacity but

physically scattered", and "small in scope but complete with virtually everything", which is the appearance of the logistics companies in our country of today, resulting in the inefficient utilization of resources and the increase of the transportation costs. On the domestic scale, the state of being "small but many, small but scattered, and small but complete" will only lead to the aggravation of competition in the marketplace and the unnecessary wastefulness of the domestic logistical resources. On the international scale, with the competition in the world market getting all the more fierce, especially with China's accession to the WTO, such situation will by no means generate any competitive advantage for the domestic companies to go global with the overseas competitors.

4.33. Scarcity of Trade Standards and Inefficiency of Information Resources Sharing

First of all, there is a shortage of uniform standards for the utilization of the equipments to meet the requirements of different cargo transportation modes. For example, the discrepancies between maritime transportation equipment standards and railway transportation equipment standards can, to a certain degree, hinder the joint Ocean and Rail Transportation from expanding its operational scope. Secondly, the standards for logistics instruments and apparatuses are not in complete outfit. For instance, due to the shortage of effective linking-up and connection between the transportation equipment and discharging equipment of various types, the universality of pallets is much lowered in the whole logistical process, thus affects seriously the operational efficiency of the logistics distribution system, and retards to a certain extent the promotion and advancement of the automation and mechanization of cargo movement, storage and transportation. Thirdly, there exists a shortage of effective connection between the standards for logistical packaging and the standards for logistical facilities and appliances. It is true that at present there have been some state-

issued provisional standards for the trade of commodity packaging, but there is still a scarcity of standards necessary for the logistical unit packaging to link up various transportation equipment, discharging facilities and warehousing machinery, which will bear some negative influence on the carriage rate of the transportation means, on the loading rate of the loading and unloading equipment, and on the utilization ratio of the warehousing facilities.

It is generally acknowledged that local barriers and protectionism as well as poor quality information-sharing and communication channels are very serious nowadays in China, especially in the area of automobile logistics, resulting in the big waste of the auto logistical resources and low efficiency in this regard. Currently, many automobile manufacturing enterprises have basically realized their internal information management system. It is typically represented by the Three Auto Making Groups who have already reached high-degree information management mechanism. However, information exchange and horizontal communication between different enterprises, especially among the enterprises in auto industry, are still much less smooth and frequent, or almost blocked from each other in insulated state, so to speak. With respect to auto logistics, these auto-making enterprises tend to act “on their own wills”, form their own systems independent of each other, even create barriers and restrictions between one another for the sake of protecting themselves, consequently they cannot find the necessary support from a comprehensive information-sharing platform to share the auto logistical resources. On the other hand, many logistics enterprises involved in this business tend to operate in their own way, keeping their information strictly confidential, regardless coordination and cooperation with one another, as a result, there appears such phenomenal behavior that in places where the auto sales volume is substantial but the logistical capacity is very low, while in some other places where the auto sales volume is small but have an

oversupply of the logistical resources. Such uneven distribution of logistical resources certainly impedes the healthy development of the auto industry.

Due to historical reasons, both the Number One Auto-Volkswagenwerk and Shanghai Volkswagenwerk have established their own totally independent logistics systems, each going his own way, with no collaboration or coordination between. Thus, in terms of transporting whole-set cars, both of them have the same problems like high ratio of empty running. When the transporting capacities of the North Volkswagenwerk and South Volkswagenwerk are interactively utilized for the sake of information and resources sharing, their costs of transportation can be hopefully reduced to a great extent.

Most of the logistics enterprises that are operating in China today are the ones transformed from the former buffer sectors or companies originally affiliated to the state-owned enterprises. Due to historical reasons many state-owned enterprises used to be run by the system of "vertically and horizontally independent of each other" with the scheme of "working separately on one's own", with the result that, over the long period of time, and driven by profit-making motives, various enterprises and sectors in different areas all invested substantially but blindly in construction projects and in procurements in order to have the control of their own warehouses and transportation vehicles.

According to the statistical data provided by China Federation of Logistics and Procurement (CFLP), the cost of transportation via vehicles in China is three times higher than that of the European countries and America with the "unloaded back ratio" amounting to approximately 37%, of which the unloaded back ratio of the vehicles incurred from the auto logistics enterprises is as high as 39%, in result, the

regional industrial structure is in serious duplicate, some logistics enterprises have excessive installations and facilities more than they can manage, and worse still, the inter link between the modernized mass production and the specialized patterns of division of labor and coordination is thus severed. Some related statistical indexes show that currently in China, the average range of truck transportation distance par time is 61 km, while in the overseas developed countries the corresponding figure already reaches more than 300 km. By contrast, we can find the fact that the transportation efficiency of the Chinese logistics enterprises is very low, which is reflected by the too many shifts and turns in the supply chain, and inconsequence, the operational return rate is made very low.

For logistics companies, failure to make correct decisions often invites in the occurrence of extra transportation costs, which is mainly manifested by the behavior of having the vehicles run empty without any load of cargo and the improper allocation of transporting capacity. It is reasonable to say that a vehicle running empty with no load of cargo is one of the worst behaviors in logistics operation. Improper dispatch of transporting capacity and improper distribution of cargo in transit, unsatisfactory planning for cargo sources, failure to adopt socialized transportation patterns and so on are the most undesirable transportation behaviors which will definitely lead to vehicles' empty running with no load of cargo, incurring the increase of transportation costs.

Improper allocation of transporting capacity refers to the failure of making the right use of various vehicles according to their distinct features and of the wrong selection of the vehicle for transporting the cargoes, which is another form of undesirable transportation behavior manifested by the making of blind decisions for the selection of transportation vehicles regardless the weight and quantity of the cargo in transit,

which results in the phenomena of overloading or insufficient loading or even causing damage to the vehicle, etc., thus wasting the transport capacity. Especially when "using a powerful horse to draw a tiny cart", which takes place very often, the cost of transportation par unit cargo will inevitably go up since the volume of the load is small.

4.34. Inappropriate selection of Transportation Modes and Incurring of Higher Cost of Logistics

This problem is to be illustrated with examples taken from the domain of auto logistics, where it is proved that the cost of car transportation by waterway is generally lower than that via roadway approximating between 20% and 30%. The statistical data provided by the Yangtze River Shipping Company Group, one of the four leading shipping companies in China, shows that when transporting cars from Changchun to Guangzhou, the cost of transportation via roadway is approximately RMB ￥ 3800—4000 per car, and the cost of that by seaway is only RMB￥2500—2800 per car, economizing the cost of transportation by 30%.

At present, the auto industry in China yields a throughput of more than five million set of cars per year, however, in such context, only 10% of the cars have been transported by waterway. Statistics in this regard indicate that Honda Motor Corp. in Guangzhou at present virtually relies on roadway transportation mode; the Number One Auto-Volkswagenwerk Corp. has had only 10% of its products transported by waterway, and even the Southeast Auto Corp. has had just 15% of its products transported by seaway via the Yangtze River into the Southwestern part of China.

It is true that waterway transportation is so much cheaper than the roadway mode, but why don't those auto makers choose this economical way? Exploring into this field,

we find that these jointly-funded auto-making enterprises all have their own affiliated transportation companies originally belonging to their former state-owned enterprises and the business of car transportation is thus generally undertaken by these companies themselves since it involves the interests and benefits of all parties concerned. Although is the factual reality that the cost of waterway transportation is much lower than that of the roadway mode, at present, about 90% of the share of this business is still carried out by roadway transportation.

It is evident that there is a great potentiality in waterway transportation market for the auto logistics industry in China, since the country has thousands of kilometers of coastlines and the key auto-making enterprises in China all have easy accesses to the ports close by their manufacturing bases—for Changchuan and Beijing auto-making bases, they have Dalian Port and Tianjin Port nearby, for Shanghai base and Jiangsu-Zhejinag base, Shanghai Port is within their easy reach, for Guangzhou base, Huangpu Port is close at their hand—which is naturally a perfect transportation system that can provide easy, smooth and inexpensive transportation service. We believe that with the ever increasing pressure on cost-effectiveness, more and more auto-making enterprises will choose to and have to go by waterway transportation in order to bring down their logistics costs.

It is quite obvious that transportation is the indispensable key link in logistics practice, and the cost of transportation constitutes a significant part in the total cost of social logistics. Therefore it is an imperative task for the talented logistics professionals to probe into this area, to explore the ways and approaches for the promotion of the multimodal transportation so as to bring down the costs and to upgrade comprehensively the overall level of the logistics industry.

Chapter 5 Some suggested measures to reduce the total logistics cost in China

Foreign consulting companies like Mckinsey, Andersen, Mercer, and etc drew a conclusion after investigating the logistics market in China that Chinese logistics is still in preliminary stage with low infrastructure, underdeveloped service modes and conventional operation concepts, shortage of professional talents, high logistics cost and low operational efficiency. From 1991 to 2003, the proportion of total logistics cost in Chinese GDP was decreased from 24% to 21.4% with the average value reaching 21.6% during the period. In 2004, the proportion remained at around 21.3%, while in the USA, it decreased from 10.6% to 8.52% with the average value reaching 9.79%.

5.1. Breaking Down Barriers among Enterprise and Achieving Integration of Supply Chain.

The author believes that it is of vital importance, no matter reducing inventory holding cost or transportation cost, that the barriers among enterprises must be broken down. In order to effectively reduce logistics cost, the non-obstacle integration of supply chain should be essentially achieved. If there exists trust crisis between the manufacturer, the supplier and the retailer and no resource sharing and sufficient information communication just for the worries about the loss of resource, clients and opportunities, the resource will not be fully used, thus resulting in many unnecessary wastes and high logistics cost.

5.2. Developing the third party logistics and enhancing the core competency of enterprises

(1). The present situation of the third party logistics in China

Table 5-1: Using proportion of the third party logistics in manufacturing enterprises

Logistics execution subject in manufacturing enterprises	Supplier	Third party logistics
Logistics of raw materials	71%	21%
Logistics of finished-product sales	43%	21%

Source: Li Yisong, Yi Hua, 2005,P80

The using proportion of the third party logistics in manufacturing enterprises is about 21%. Comparing to the data from China Association of Warehousing and Storage in 2000, the proportion dropped by 5 points by percentage, indicating that the division of labor in logistics was more apparent. In 2000, the proportion of the third party logistics is about 16.1%.

Table 5-2: Proportion of using the third party logistics in commercial enterprise:

Logistics execution subject in commercial enterprises	Supplier	Third party logistics
	74%	13%

(Li Yisong, Yi Hua, 2005,P80)

The percentage of third party logistics in commercial enterprises is only 13%, which indicates the low socialization of logistics in commercial enterprises, and, at the same time, shows the lack of effective logistics support in retail business characterized by small quantity, large variety, high frequency and great urgency.

Table:5-3: Using proportion of third party logistics service in China and developed

countries and areas(%):

Country	Proportion of third party logistics service	Proportion without third party logistics but with its requirements	Proportion of increasing using third party logistics service within three years
Europe	76	24	62
USA	58	33	72
Japan	80	----------	-------
China	15	18.6	62.5

Source: Zhang Hong, 2004, P52

The table above shows that the third party logistics service has just started. The proportion of usage in China is far below that in developed countries and areas. Most enterprises develop logistics activities by themselves and have their own vehicles and warehouses.

Earlier third party logistics enterprises in China were transformed from traditional warehousing and transportation enterprises. For example, Shanghai Friendship Group Incorporated Company was formed after the separation and transformation of Shanghai Commercial Warehousing & Transportation Company. In early 1990s, 20th century, it served professional logistics service for the largest daily consumer goods company internationally---Unilever. Its business, from initial warehousing and transportation service, has developed into multi-functional and personalized services like transportation, warehousing, distribution, information feedback and etc. They both have built good strategic partnership of co-ordination.

From the perspective of service range and function, the third party logistics enterprises in China are mainly in some basic logistics business like transportation, warehousing and etc. and value-added functions like process, distribution, customization and etc. are still in the process of developing and perfecting. A survey from China Association of Warehousing and Storage also shows that the logistics outsourcing of manufacturing and business enterprises mainly centralizes in the urban distribution, simple warehousing and main line transportation. In the logistics outsourcing of manufacturing enterprises, the percentage of simple warehousing covers 21%, main line transportation 36%, urban delivery 43% and package 4%. In the logistics outsourcing of business enterprises, the percentage of simple warehousing covers 37%, main line transportation 21%, urban distribution 43% and package 14%. The proportion of the integrated service for clients from the third party logistics enterprises is not high.

(2). The effect of the third party logistics development on logistics in China

The third party logistics company makes enterprises cancel logistics equipments like warehouses, vehicles and etc. and shift the investment of logistics information system to the third party logistics enterprise, thus reducing the operation cost of logistics. It can also reduce staff directly engaged in logistics to reduce labor cost, cut down stock quantity, decrease inventory holding cost and greatly increase transportation efficiency and reduce transportation cost via the third party logistics services. Therefore, the third party logistics may help enterprises reduce logistics cost. The reason for low cost of logistics in the USA is mostly that the third party logistics has been valued long ago and perfectly developed today, unlike China in which the third party logistics has just been started.

With the changing of market environment outside, the operation and manufacturing of

enterprises are becoming more and more complicated. Enterprises not only need to put a lot of efforts into manufacturing and operation activities but also need to deal with complicated interpersonal relationship. If the third party logistics is applied, making contact with customers directly can be avoided and the relationship net is simplified, therefore more efforts will be put into the manufacturing and operation management.

Therefore, integrating the societal logistics resources, developing third party logistics vigorously is very important to our country, especially in the aspect of reducing logistics cost.

(3) How to develop the third party logistics in China

1. Strengthening the macro-guidance and policy adjustment

The third party logistics in China has just started, therefore the support and promotion from government departments are urgently needed to create a good macro-environment for the modern logistics development. Government should make relevant policies to push and promote the third party logistics development, support it from the aspect of fund and policies and help enterprises out of difficulties.

2. Adopting measures to enlarge the scale of third party logistics service enterprises in China

Government should restrict the development and registration of the third party logistics enterprises which are smaller than economy of scale by making measures like drawing up modern logistics regulations and working out restrictions on the accession to Chinese market. Government should also enlarge the present scale of the third party logistics enterprises by encouraging joint venture, cooperation, merger and

integration. Since the third party logistics in China has just started, the 3PL enterprises must follow the scientific guidance in order to participate in the global logistics market competition.

5.3. Speeding up the construction of inter-modal container transportation in China

Enterprises should make a unified plan and management of all kinds of transportation modes; unify the railway, road, inland waterway and sea transportation in the planning of CFS and logistics centers; join varieties of transportation modes and completely break down the walls between every transportation mode. The advantages of every transportation mode should be maximized: water transportation performs a very useful role in transporting large amount of bulk cargo and containers in the regions along the river, road transportation plays an important role in short distance transportation in cities and in transportation of less-than-carload goods and railway plays a vital role in the middle or long distance transportation of large amount of bulk cargos. Logistics cost can be effectively decreased by realizing the integration of all kinds of transportation modes and developing coordinately.

5.4. Highly valuing the research and innovation of modern logistics and speeding up cultivating personnel specialized in logistics field

The reduction of logistics cost and management of modern logistics, to a great extent, depend on the development of science and technology. Government should actively support and guide the researches on basic logistics theories and technology, and on the other hand, fully arouse the enthusiasm of researches on logistics management in enterprises, universities and scientific research institutions, promote the cooperation between them and strengthen the development and application of logistics technology.

Meanwhile, multi-level and diversified logistics education system should be set up to develop specialized personnel in modern logistics.

The government should encourage universities to open and set up relevant disciplines and courses according to the market demand to train qualified personnel in logistics field. Varieties of forms, such as combining study at school with on-job training, can be adopted for the development of multi-level training and education.

Chapter 6 Conclusion

As the process of economic globalization is accelerating and China's economy is merging into the mainstream economy of the world, many Chinese enterprises are unavoidably involved in the fierce competition in both domestic and international marketplace, which inevitably presents much higher demand on the development of the logistics industry in China.

Since China's entry into the WTO, a lot of multi-national logistics enterprises have begun to draw out strategic plans for marching into the Chinese market, which impels the young upstart Chinese logistics industry to face and take all the more severe challenges, but at the same time also creates rare opportunities for the logistics enterprises in China to develop and thrive. It is undoubtedly a good idea for the Chinese logistics firms to acquire the advanced knowledge of logistics technology and management from some developed countries, however, we should be fully aware first of the gap between China and the overseas developed countries.

The core of modern logistics research is the research on logistics cost. The ultimate aim of logistics modernization is to realize the expected service level with the minimum cost, or realize the highest service level with a certain cost. With logistics industry being regarded as "the third profit-making source", the study on logistics cost, and finding ways to bring down the logistics cost has already been a hot issue and major concern in the logistics modernization process in the world.

In the United states of America, Japan, and other developed countries, the logistics cost calculated only accounts for about 10% of their GDP, while in China it reaches the figure of 20% in our GDP. This indicates that logistics industry in China still remains on the primary stage.

This dissertation attempts to undertake the analysis or diagnosis on the problems why the logistics cost in China is so much higher than that in some developed countries by means of contrasting the logistics cost in China to that in the developed countries. According to the cost classification which is most frequently used at present, the total logistics cost is mainly composed of by such factors as inventory holding cost, transportation cost and executive logistics management cost. The inventory holding cost and transportation cost are the two main players in it, covering a large proportion of about 80% of the total cost. As the proportion of executive logistics management cost is small and abstract, due to the limitation of space, it is not discussed in this dissertation.

A large amount of data and cases are used for the illustration and elaboration on how the advanced management approaches and the modern achievements in science and technology are applied in the developed countries to the task of bringing down the inventory holding cost and transportation cost, and by contrast, the present situation of logistics industry in China is exposed, revealing the actuality of the area where logistics cost is high but logistics service level is low.

The author believes that the reasons for the high inventory holding cost in China are firstly because of the underdeveloped software and hardware facilities of the warehousing industry. The hardware facilities refer to the loading and discharging equipments and infrastructure of warehouses. The software facilities mean the information communications system the warehouses use. Surveys show that only 39% of the logistics enterprises in China have been equipped with specialized information communication system. Compared with the developed countries, the rate of utilization of the information communications system in warehouses in China is

relatively low which cannot meet the demand of clients. Secondly, the supply chain integration still remains a bottle neck in our country of today. Since inventory exists in every link of the supply chain, only when the integration of the whole chain is achieved can the storage cost be reduced in the real sense. What is more, for the reason that the integration of the supply chain is not achieved fully, the development of the third party logistics in China is still in the primary stage, waiting to be further improved.

In terms of the integration of the supply chain, the writer holds that it is of vital importance for different enterprises and industries to break down the barriers between or among them, to change the present situation of "each doing business in his own way", to speed up the information circulation in the supply chain and to reform the mechanism of information resources sharing, which can not only greatly help to bring down the inventory holding cost, but also reduce transportation cost to a large extent.

The grim situation is that a great many transportation enterprises in China have not reached the stage of economies of scale. "Small but complete" is the prevalent and typical phenomenon of the state-owned transportation enterprises, which results in the ineffective use of the resources, causing high transportation cost. Meanwhile, the bad conditions of the information communication channels greatly restrict the rapid development of the modern transportation industry in China. Failures to make appropriate selection of transportation modes, especially the frequent occurrences of unloaded back ratio which is far above the level of the developed countries, still maintain a very serious problem for the transportation enterprises to overcome.

In conclusion, we hold the view that it is of great significance and pragmatic value for the logistics enterprises in China to reduce the inventory holding cost and the

transportation cost by means of accelerating the development of third party logistics, enhancing inter-modal transportation system, improving the integration of the supply chain and redistributing the logistics resources, so as to effectively reduce the total logistics cost, raise the overall logistics service level and narrow down the gap between logistics industry in China and that in the developed countries.

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