
The Supply Chain Logistics Institute

Northeastern University in China at Qinhuangdao

2004 China Road Transportation Enterprise Survey Report

February 3, 2005

Jim DAI*, Yuepeng LI, Xiutian LIU, Yang WANG, Nancy WONG and Chen ZHOU*

* Authors for Correspondence. Questions should be directed to czhou@isye.gatech.edu



Northeastern
University in
China



TABLE OF CONTENTS

ACKNOWLEDGEMENTS	1
EXECUTIVE SUMMARY	2
STUDY OBJECTIVES AND METHODOLOGY	4
PROFILE OF SURVEYED FIRMS.....	5
SUMMARY OF KEY FINDINGS.....	6
DETAILED ANALYSES	9
Operational Characteristics	9
Costs, Charges, Taxes and Profits	14
IT Infrastructure Development	15
Service Quality	18
Customer Relationship Management.....	21
Enterprise Resource Management	23
Company Organization Structure and Business Model.....	26
Core Competency Analysis.....	26
Business Strategy.....	30
CONCLUSION.....	35
PARTICIPATING INSTITUTIONS AND AUTHORS	36
Northeastern University in China (http://www.neu.edu.cn) and Qinhuangdao Campus.....	36
The Logistics Institute – Asia Pacific (TLI-AP) ... Error! Bookmark not defined.	
The Logistics Institute – Georgia Tech.....	36
Authors.....	37

ACKNOWLEDGEMENTS

Our thanks go to all participating companies and their representatives. Their support, information and final checks make this study possible. Our special thanks also go to Mr. Zhengjun Wang, Vice Secretary-General of China Road Transportation Association, Ms. Yike Huang from UPS Shanghai, Mr. Zhimin Li from Hebei Road Transportation Bureau, Qingdao Road Transportation Administration and Hebei Qinhuangdao Commerce Transportation Association for their critical support during this 2004 survey. We also thank Hebei Study Abroad Professional Service Center for their support. Special thanks also go to those colleagues from China road transportation industry and the eight companies in China that have participated in the survey.

EXECUTIVE SUMMARY

Compared to most developing countries, China provides lower labor cost with better infrastructure. This combination makes it the manufacturing base of choice for the world. However, multi-nationals often find that the cost of domestic transportation is very high, often higher than that in the developed countries. Since road transportation constitutes over 70% of domestic transportation in China, an understanding of the cost structure, services and key players in road transportation would be of interest to anyone involved in manufacturing, selling or providing logistics services in China, especially with China's joining of WTO.

In an effort to better understand road transportation in China, the Logistics Institute at Georgia Tech, with support from The Logistics Institute Asia Pacific conducted a study in 2004. This study is an extension of the 2002 study on the China Logistics Providers Survey and the 2003 study on China Logistics User Survey. Between February to May 2004, we conducted extensive face-to-face interviews with middle and senior managers from eight companies. In addition, they also responded to a survey of 50 questions. In order to ensure the diversity and breadth of coverage, we selected companies that differ in: ownership – state owned, joint venture or private; size – revenue from US\$7 - US\$1,200 million; services – parcel delivery, LTL, TL or distribution; network coverage; and history.

Although not uncommon elsewhere, a major cost item in China is toll charges. Nearly all newly built highways and bridges in China are tolled. The cost of the toll constitutes 20 – 40% of the total transportation cost, depending on the percentage of toll roads and segments traveled. The cost of tolls in long haul transportation can be twice as high as the fuel cost. The toll cost is so high that many small operators overload their trucks in order to reduce unit transportation cost. The rates were initially set by the organization that built each highway segment, which led to wide variations. As a result of these wide variations, the central government tried to unify the toll structure in May 2004. However, early feedback indicates that this move has led to the increase of the overall toll costs. At the time of this writing, further adjustment is being considered. In addition to toll cost, higher deadhead rate, inefficient material handling, higher damage rate due to poor packaging and lower freight visibility are other costs higher than those in advanced countries .

From the study of these eight companies, we witness the emergence of a market driven and modern Chinese road transportation industry from a planned and outdated one. These companies are all striving to provide world-class services while competing with small, less regulated and low-cost operators at the same time. A major reason for their success is that they have evolved from a trucking company to a full logistics service provider. They emphasize on the development of service, core competence, service quality, network coverage, organization, corporate culture, strategic thinking and customer focus. Some have established extensive coverage networks in less than 10 years; some have integrated well with the manufacturing industry while others have achieved a high annual growth of over 30%. Some also focus on information technology, using software that is developed in house and data base management systems that are linked to bar codes or GPS systems. These may be some of the reasons why the domestic 3PLs achieved higher customer satisfaction than foreign or joint venture 3PLs, a finding from the 2003 survey results.

This report is organized into five sections. We begin with the study objectives and methodology. This is followed by the profiles of companies surveyed. We then summarize

key findings from the study. After that, we provide detailed analysis by: operation mode characteristics; service characteristics; cost and profit; information technology; quality and its measures. Finally, we end with our concluding remarks.

STUDY OBJECTIVES AND METHODOLOGY

From February to May 2004, TLI at Georgia Institute of Technology and China Northeastern University at Qinghuangdao has jointly organized a China Road Transportation Company Survey. Eight companies were carefully selected and comprehensive interviews were conducted. The eight companies are Heilongjiang Hua Yu Logistics Group (thereafter referred to as “Hua Yu”), A transportation group company in Qingdao (“The Firm in Qingdao”), Shanghai Jia Ji Express Ltd. (“Jia Ji”), Hebei Han Dan Communication and Transportation Group (“Han Dan”), Beijing ZJS Express Ltd. (“ZJS”), Beijing China Rail Express Ltd. (“CRE”), Shanghai Pudong Transportation Company (“Pu Yun”) and Qingdao Hai Qian Logistics Ltd (“Hai Qian”). Three companies are classified as grade A, two are grade B and three are grade C (see footnote 1 of Table 1 for government business scale classification). In terms of ownership, some are state-owned-enterprises (SOEs), some are joint venture (JV) firms and others are non-SOE firms. Geographically speaking, some companies are located inland while others are in the coastal areas. They provide transportation services covering both regional and/or nationwide area. In the 2004 report by China Road Transportation Association (CRTA), Hua Yu is ranked 2nd, The Firm in Qingdao is 28th, Jia Ji is 71st and Han Dan is 83rd. We believe the information from these eight firms provides a good representation of the state-of-industry of mid- to large-sized logistics service providers amongst the 50,000 firms classified as logistics businesses in China.

This survey was conducted mainly through face-to-face interviews, on-site visits, filling out supplementary survey forms and secondary research based on public information. We interviewed 10 senior managers, 8 middle level managers and 8 managers in branch companies or subsidiaries. In terms of education, 4 have Master degrees, 9 have Bachelor degrees and 3 have senior level certificates. These 8 companies were studied in detail from different angles such as operations, resource management including human resource, IT infrastructure, core competency, internal and external environment, corporate development strategy and finance. At the end of the survey, the participants were asked to assess China trucking industry and development trends, and to comment on government logistics development strategies.

This 2004 survey is an extension of the *2002 China Logistics Provider Survey* and *2003 China Logistics User Survey*. This survey strives to provide insights to China trucking companies by studying the representative firms. Specifically, this survey contributes knowledge to the following areas:

1. Factors for growth;
2. Style in management and operation;
3. Cost structure, especially tolls and taxes;
4. IT system development and utilization;
5. Service quality and measurement;
6. Resource management;
7. Organization structure and business model;
8. Competitive advantages and core competencies;
9. Corporate development strategies;
10. Outlook and development trend of China trucking industry.

PROFILE OF SURVEYED FIRMS

We selected the companies with a variety of asset classification and capital assets, ownership, fleet size, warehouse space, number of operation sites, number of employees, revenue and years of business experience. The profiles of these firms (based on 2003 information) are summarized in Table 1. The geographic scopes of operation of these companies are: one is in Northeast¹ China, three are in the North² and 4 are in the East³.

Table 1 Profile of the Eight Surveyed Firms

	HUA YU	THE FIRM IN QINGDAO	PU YUN	HAN DAN	JIA JI	ZJS	CRE	HAI QIAN
Business Scale Classification	A	A	A	B	B	C	C	C
Ownership Type	Non-SOE	SOE	SOE	Restructured SOE	Non-SOE	JV	Non-SOE	Non-SOE
Annual Revenue (100million RMB)	8	10	1.2	3.11	8	3.3	5.43	0.6
Fleet Size	1370	5000	784	2000	800	1200	521	188
Warehouse Space (m²)	166070	38846	4000	5110	137000	60000	50000	20000
Employees	9144	10000	1423	3998	6600	6600	3300	500
Operation Sites	710	91	⁶ (+6 under construction)	20	500	280	186	10
Year Established	1955	1949	1960	1945	1988	1994	1994	1992

Note:

1. Business Scale Classification is determined by government based on a comprehensive set of parameters including net asset, vehicles and facilities, business history, human resource quality, management performance, operation network and revenue. There are five grades of classification with the first grade highest and fifth grade lowest. This classification process does not apply to private operators.

2. Ownership type: SOE means wholly state owned company; Non-SOE applies to company that is founded by non-State investments; *Shared companies are companies funded and controlled by multiple investors; JV is formed with domestic and foreign partners.

¹ Heilongjiang, Jilin, Liaoning

² Beijing, Hebei, Neimeng, Shanxi, Tianjin

³ Anhui, Fujian, Jiangsu, Jiangxi, Shandong, Shanghai, Zhejiang

SUMMARY OF KEY FINDINGS

All eight companies strive to become the integrated logistics provider from their origin as traditional simple trucking service providers. These integrated services may include road transportation, multi-mode transportation (truck, rail, air and ship), freight forwarding, warehousing, distribution, transshipment, express delivery, containerization, and logistics information system and metro area distribution. Some companies provide inbound supply to manufacturing industry. Some provide distribution service to wholesalers, retailers and individual customers. The industries they serve span from pharmaceutical, electrical and machinery, electronics, books and printing, chemical, apparel and automotive industry, etc. Their target customers are mostly private and joint venture firms. The main revenue of these eight companies comes from long-term customers. Most firms focus on the well developed regions such as Beijing-Tianjin-Tanggu, Yangtze River delta and Pearl River delta areas while a few companies such as Hebei Han Dan and the Firm in Qingdao focus on regional transportation.

Most companies emphasize network development and consider network scale a competitive advantage. A major characteristic we learned from this study is that companies leverage network expansion to increase their business size and capability. They rely on road network, air route and railroad network to deploy nationwide logistics services.

The cost for most companies is comprised of toll, gas, wage and benefits, vehicle depreciation, vehicle registration (including public road maintenance), overload fines, warranty, vehicle maintenance, insurance and administration fees, etc. For long-haul trucking companies, toll charges account for 20% to 40% of the total transportation cost, and gas takes about 14%~40%. On average, the sum of these two items is above 50% of the total transportation cost. The firms unanimously expressed concerns that toll charges are too high and lead to the widespread practice of overloading trucks. Many small and less regulated truck operators take away market shares by overloading trucks and charging ruinously low fares. Transportation cost is at the historically lowest level. Profit margin rarely exceeds 10% of revenues. Even at this low profit margin, the cost to deliver quality services in China is still equal to or up to 15% higher than in the US. This is mainly due to toll charges, higher deadhead rate, inefficient material handling, higher damage rate due to poor packaging and lower visibility.

All firms realize the importance of IT system. Most firms have set up in-house IT department to build hardware infrastructure and develop software. A few firms have outsourced or partnered with professional companies to develop software. Some firms have taken advantage of network and IT systems from application software platform (ASP) services. Technologically these firms have commonly deployed TMS (transportation management system) and WMS (warehouse management system). Some have applied Global Positioning System (GPS), bar code technology, warehouse monitoring technology, decision support system, GSM nationwide roaming communication platform and short message technology. When making selections to specific IT technologies, these firms all made decisions based on customer requirements and practical business needs. As far as the functionality of the IT system is concerned, firms choose IT systems to meet their core business needs first and gradually expand functionalities to support corporate-wide management. Most firms believe that the use of IT system has greatly improved business operations and development,

enhanced business management and customer service levels, and eventually enhanced their competitive advantage. In general, they are satisfied with their IT system performance.

All eight firms have earned ISO quality certifications. Each company has its own service quality criteria and standard operating procedures (SOPs), and has established operation monitoring and quality control procedures. Many firms have developed business metrics such as on-time delivery, percentages of damage customer claim and claim reimbursement, etc. They make service commitments to customers and monitor these commitments by implementing SOPs and workflow information management system. Most firms have back-up procedures for freight take-over, IT based emergency fleet handling and management of freight damage and loss. Compared to their competitors, these firms believe they have better service quality and more competitive value to price ratio. Each firm pays a great deal of attention to what customers value, such as service quality, price, cycle time, on-time delivery, damage rate, and continuous service quality improvement.

All firms emphasize customer relationship management. They carefully maintain the relationship with their customers through service quality improvements, customer on-site visits, and customer claim handling. All firms have customer marketing and service department. Some firms have dedicated project teams and on-site representatives to better serve big customers with certain size projects. The eight companies pointed out that they attract new customers through market study, brand and business strength.

Some fast growing companies experience significant challenges in human resource management. They rely on recruiting, training and educating current employees, clear promotion mechanism to help build careers for employees. All firms believe that good benefits and career planning helps keep their talents. Most firms have in-house training center that offers regular and special training to employees. Most firms believe that the physical resources such as material handling equipment, space and vehicle resources are insufficient to support high growth rate. All eight firms are planning to increase capital investment in these resources, and are seeking partners to share resources for mutual benefits. In terms of intangibles, every firm has good reputation and brand recognition.

The organizational structures of these firms follow centralized, decentralized and hybrid models. The first type is a network-based enterprise and it is organized by functional areas. The structure is highly centralized with one control center and multiple operation centers. Its business management, operations and information system management are integrated and centralized. The second type is a decentralized business structure with multiple business units. Each business unit is an independent entity that conducts its own operations according to centralized business plans, goals, budgets and performance metrics determined by headquarters. Headquarter controls and manages business units to a limited degree. The third type is a hybrid model that combines the abovementioned functional areas with a business department. This model combines the advantages of both models. It can centralize certain businesses, and also set up independent entities to increase flexibility between centralized management and operations.

In terms of investment and financing, a few firms rely on regular loans from banks. Some firms obtain funds through strategic partners or go public. Among the eight firms, most have partners, especially for network-operated firms, as they need partners to increase capacity and expand transportation network. The partners these firms work with vary from SOEs to

non-SOEs to private companies. The trend is that the eight firms are seeking strong partners who own domestic and/or foreign markets to leverage their logistics capability and modernization.

The eight firms believe that they have competitive advantages over others in their respective markets. They all value service quality, network size, IT system and value to price ratio as key competitive edges. Analysis also shows that road transportation network planning, business management, IT system capabilities are core competencies for network-oriented companies. We found newly emerged network-oriented companies frequently study their market positioning to set short-term goals and long-term plans. They choose very specialized logistics area that they have experience in to do business and dedicate themselves to logistics market niches. Most firms feel satisfied with their market positions, management and service quality. They all feel positive for the future and most have goals ranging from being the best regional player to leading in the state and being internationally recognized. A few firms have plans to go public in the near future.

All firms indicated that the lack of unified government regulations, toll overcharges and market competition chaos are the most restraining factors for business. They believe that the government needs to systematically fix the existing issues. Also the government needs to strengthen its authoritative power to establish, consolidate, implement and enforce regulations. The State must realize the importance of cultivating domestic enterprises. When speaking about the accession to WTO and the competition from foreign companies, the firms feel that they cannot compete with foreign counterparts in management and capital investment, but they have the advantage in operation network, localization and price.

Despite the domestic advantages of these surveyed firms, their sizes are small, and technology and management are less advanced compared to international competitors. These firms need to significantly improve their professional image and performance as well. The firms also lack experience competing in international market. Domestically these firms must overcome many obstacles in the evolving market economy in China. However, some of them may stand to win in this ever-localized competition in the China logistics market.

DETAILED ANALYSES

Operational Characteristics

Among the eight firms, four have distinct advantages in operation networks. Hua Yu has the most number of operation sites in China resulting in a strong network advantage. Hua Yu focuses on regular freight transportation market and has LTL, TL and door-to-door capability nationwide for business, industry and individual customers. Hua Yu has 51 independent first level subsidiaries that have their own finance and truck scheduling authority. Further more, each subsidiary has its own freight transshipment and storage center. Hua Yu's resources include 156 lanes, 1300 vehicles, 1100 two-way contract vehicles, 1000 one-way contracted vehicles, and 710 wholly owned subsidiaries located in over 400 cities and 31 provinces and autonomy states. With such well-connected resources, Hua Yu is able to provide efficient 24 hour door-to-door, warehouse-to-warehouse one-stop total logistics services for customers at low logistics cost. Hua Yu has been underwritten by PICC (People's Insurance Company of China) for 1 billion RMB so customers have more confidence when doing business with Hua Yu.

Jia Ji is one of the earliest among its peers to develop network trucking transportation business in China. Jia Ji has a leading edge in providing LTL, TL and Express delivery services across the country. It has developed a nationwide freight network with Shanghai, Beijing, Guangzhou, Wuhan and Lanzhou as hubs to link the entire network. In the East, there is a sub-network around Shanghai that is comprised of 60 subsidiaries covering Jiangxi, Zhejiang, Anhui and Fujian. In the South, 30 subsidiary companies form a freight delivery network around Guangzhou to reach the whole Pearl River Delta area. In the North, 38 subsidiary companies are connected to span North, Middle mainland and Southwestern regions. Surrounding Wuhan there are 20 subsidiary companies serving Hunan, Sichuan, Hubei, Shannxi, Jiangxi and also moving deeper towards the Southwest. In Northwestern China, Xian and Lanzhou are the two centers to structure the goods transportation network in Northwestern region.

ZJS focuses on express delivery business. It has advanced information system and advantages in utilizing domestic air route network. ZJS offers domestic door-to-door express delivery service. It has developed seven logistics bases in Beijing, Shanghai, Guangzhou, Shenyang, Chendu, Wuhan and Xian with total warehouse storage area close to 60,000 m². Nationwide ZJS has 7 subsidiaries, 49 branches, 90 operation offices and 127 drop-off sites. In addition, ZJS has 200 partnered companies. Up to this point, ZJS has multiple express railroad lanes across the country including Beijing-Guangzhou, Beijing-Shanghai, Beijing-Shenyang, Xian-Zhenzhou, Chengdu-Xian and Guangzhou-Shanghai etc., and also regional express railroad lanes and inner city trucks. A nationwide express network is preliminarily in place.

Compared with the other surveyed firms, CRE has a unique combination of road network and railroad lanes to provide LTL and TL Express door-to-door service on regular freight. CRE also has regional logistics centers. CRE owns 117 road transportation lanes, 186 branches and business offices located across the country. It has more than 320 5-ton and above box trucks (as opposed to flatbed) and over 90 40-foot container trucks. CRE has been granted by China Ministry of Railroad (MOR) to exclusively operate 2 parcel lanes and 3 luggage rental

lanes. The daily one-way transportation capacity is 663.1 tons. CRE is also working with Beijing Post to do mail deliveries from Beijing to Shanghai and Beijing to Guangzhou.

The Firm in Qingdao is one of the eight logistics companies selected by Ministry of Communications in 2003 to be a prototype for new business. It is the largest transportation companies in Shandong Province. It provides a multitude of services including passenger and freight transportation, ocean/land/air forwarding, import/export, domestic and international logistics, retail supply and storage, vehicles diagnosis and repair, real estate development, construction and hotel/entertainment. The Firm's main business is freight transportation, and it is expanding to full logistics services with its own logistics park development. It provides metro distribution service, and operates finished goods logistics, large parcel delivery, container transportation and LTL. The Firm in Qingdao has Grade A freight forwarding qualification, import/export authority, and manages international container yard and logistics park. It focuses on regional logistics market and has good reputation.

Han Dan also has a comprehensive business portfolio including passenger and freight transportation, vehicle sales, spare parts supply, lubrication oil supply, vehicle driver and technician training, restaurant business, tourism and lodging, advertising and information services. Passenger transportation is Han Dan's major business. In freight transportation, it provides mostly coal and refined iron powder transportation, and recently starts container transportation business and manages international container yard. Han Dan also focuses on regional logistics market.

Pu Yun is another in the eight logistics prototype companies selected by Ministry of Communications in 2003. It is a subsidiary of Shanghai Communication and Transportation Group. Pu Yun positions itself as a transportation service and transportation planning provider. Its main business includes customs forwarding, automotive parts, consumer electronics, retail and fast-moving consumer goods. Its specialty is serving startups in automotive and high-tech manufacturing industry located in the Yangtze River Delta area. The range of Pu Yun's service covers city distribution, long haul, short haul, contract trucking, milk run and JIT distribution, refrigerated goods transportation, etc. Its contract trucking service also covers special freight such as bulk freight, refrigerated goods, hazardous products and whole container transportation. In automotive transportation business, Pu Yun provides milk runs from tier-1 supplier to final assembly plant and from tier-22 suppliers to tier-1 suppliers, as well as JIT delivery and associated warehousing services. Pu Yun is the first professional trucking company to participate in parts inbound logistics and milk runs in China.

Hai Qian Logistics Ltd is a freight transportation company with businesses covering long haul trucking, warehousing, processing and distribution. It centers in Qingdao and focuses on regional automotive parts and assemblies, home appliances manufacturing and electronics part market to provide supply logistics and distribution services. Hai Qian also provide warehousing and some value added processing for customers. Table 2 is a summary for these eight surveyed firms.

Table 2 Company Business Profile

	Trucking	Railroad	Air	TL	LTL	Trucking based Multimodal	Express	Integrated Logistics	Others
Han Dan	X			X	X	X	X	X	Warehousing, Container yard
Hua Yu	X			X	X	X	X	X	Cross docking
ZJS	X		X	X	X	X	X	X	Cross docking
CRE	X	X		X	X	X	X	X	Warehousing, Distribution
The Firm in Qingdao	X			X	X	X	X	X	Warehousing, Distribution, Logistics Park, Container Yard, Freight Trade Platform
Hai Qian	X			X			X	X	Warehousing, Basic Processing & Distribution
Jia Ji	X	X	X	X	X	X	X	X	Cross docking
Pu Yun	X			X	X	X	X	X	Contract Trucking, Automotive Logistics, FMCG transportation

Business Characteristics

Hua Yu, Jia Ji, ZJS and CRE are network-based companies. They take advantage of the geographic breadth of their long haul lanes. As a result, these four companies are more diverse in their customer base and freight type.

Specifically, 90% of Hua Yu’s customers are domestic and 10% are international customers. Hua Yu’s customers range from SOEs, Non-SOEs and foreign companies. Most of their business comes from manufacturing, retail, and the wholesale industry. In particular, most freight comes from the Pearl River Delta, the Yangtze River Delta and the Beijing-Tianjin-Tangu area. Hua Yu has over 20,000 long-term customers.

Jia Ji is similar to Hua Yu in terms of its freight type variety, large long-term customer base, and high business volume from the economically developed coastal areas of Pearl River Delta, Yangtze River Delta and Beijing-Tianjin-Tangu regions. Many of Jia Ji’s customers are long term patrons from China and abroad. Jia Ji carefully selects its customers to ensure high profitability.

Most of ZJS’s customers are foreign companies and Non-SOE companies. Retailing and wholesale companies account for 20%-30%, manufacturing companies account for around 10%, and the rest are individual customers. Long-term customers constitute 10%-15% of the customer base, and their business volume accounts for 50%-60% of the total freight volume. ZJS also has a wide variety of freight types including electronics, information technology, pharmaceuticals and automotive parts. Most of the package weight is below 50kg. Majority

of the business comes from Beijing-Tianjin-Tanggu (30%), Yangtze River Delta (20%), and Pearl River Delta (20%) area. The business volume from the two Delta areas is increasing steadily. ZJS has more than 200 operation sites and over 200 partner sites in small towns. Currently ZJS's business can cover over 90% prefecture-level cities and 30%-40% county-level cities. Road transportation is given priority if it can meet the delivery requirement.

CRE's customers are mainly JVs and non-SOEs, and 60% of the business comes from retail and wholesale customers. CRE has over 10,000 long-term customers and its annual volume is more than one million tons. Major freight types include electronics (20%), apparel (10%), books (10%), pharmaceutical products (20%) and chemical products (20%). CRE's businesses are centered on Beijing, Shanghai and Guangzhou areas and Chengdu for the Southwest region. Beijing-Guangzhou lane accounts for 10% of the business and Beijing-Shanghai lane accounts for 30%. Railroad and trucking contribute 45% each and the remaining 10% is air.

The Firm in Qingdao and Han Dan are two companies with a long history. Their customers are mostly long-term customers in the manufacturing industry. Most of them are located inside Shandong province where the two companies are located. The Firm in Qingdao has over 60 big companies as major customers, including Haier, Hisense, Aucma, Qingdao Beer, Coca Cola, Huanghai Tires, Yi Zhong Tobacco, etc. Its major freight type is electronic products. The Firm transports products from these suppliers through 12 dedicated lanes to end customers in Shanghai, Chengdu, Chongqing, Guizhou, Xinjiang, Tianjin, and Lianyungang. It also balances return truckloads through 21 offsite logistics nodes. In the Qingdao region, the Firm distributes goods for retail companies inside the city. As far as volume percentage is concerned, finished goods for manufacturing companies account for 70%, retail and metro distributions for 15% each.

Han Dan is more of a traditional transportation company compared to the other surveyed companies. Its major customers are state owned power plant, steel-manufacturing companies such as Han Dan Steel Group, Han Feng Power Plant, Ma Tou Power Plant, Xin Xing Molding Pipe Plant, and Xing Tai Steel Factory. Han Dan's major freight type includes coal (70%) and refined iron powder (30%). Most of Han Dan's customers are located in Hebei and Shanxi provinces. Han Dan transports coal from Shanxi coal mines to customers' production sites.

Pu Yun operates from Pu Dong airport cargo station to provide contract transportation services. It has more than 180 custom qualified trucks to transport raw materials and finished goods for high tech companies located in Shanghai Songjiang, Caoheting, Suzhou, Kunshan, Wuxi, Changzhou, Nanjing, Hangzhou and Ningbo areas. The customers include over 80 non-vessel operating common carrier (NVOCC) and freight forwarding companies such as Pu Dong airport cargo station, UPS, DHL, BAX, EXEL, SCHENKER and JHJ. In automotive parts delivery, Pu Yun has contracts with Shanghai GM, Shanghai Volkswagen, Yanfeng Visteon and Johnson Controls. In retail and trade businesses, Pu Yun's customers include big retailer Lotus Super center, Luosen Supermarket, SONY TV, Hitachi washer and Kao products in FMCG industry.

Hai Qian provides transportation, warehousing, processing and distribution for the following manufacturing companies. 1) First Automotive Group (FAG). Hai Qian transports automotive engines, transmissions and axles to their own warehouse, and then provides JIT

delivery to production lines at FAG Qingdao plants. If necessary, Hai Qian can also perform some assembly of engine, transmission, clutch or other accessory in its own facility. Hai Qian also transports components to FAG's Chengdu plant when necessary. It is important to point out that 40% of the engine used in FAG Qingdao is from Dalian Diesel, who provides direct transportation, warehousing and delivery. 2) Home appliances manufacturer such as Qingdao Haier, Hisense and Aucma's CRT tubes. Hai Qian transports CRT tubes from Rainbow Group in Shaanxi to Hai Qian's warehouse in Qingdao, and then provides JIT delivery to production line of those manufacturers. In the same time, Hai Qian also provides distribution and warehousing services for finished products for Haier, Hisense and Aucma. 3) Shaanxi Rainbow, Dalian Da Cha, Chang Hong, Datong Gear, Anhui An Kai Bridge company, Shanxi Falashite, Weifang Harvesting Machine Factory and Rongcheng Tire Plant. Geographically, Hai Qian's business mostly comes from Changchung, Qingdao, Chengdu, Dalian, Xianyang and Mianyang. It is notable that Hai Qian has a lower rate of deadhead.

As pointed out earlier, Pu Yun, The Firm in Qingdao and Hai Qian have successfully integrated into the supply chains of automotive and home appliance manufacturers as well as their associated parts and components suppliers. For instance, Pu Yun operates milk runs and JIT deliveries for Shanghai GM and Shanghai Volkswagen inbound logistics. This supply chain collaboration is implemented with the involvement of a 3PL – TNT, in which TNT integrates inbound, outbound logistics and post-sales logistics services. The volume of inbound logistics is very high and demands large fleet size. Pu Yun invested one-fourth of the required vehicles and partnered with three other suppliers to fulfill these needs. In this automotive supply chain, Pu Yun's objective is always to keep itself among one of the major 3PL partners with TNT, and provide a variety of transportation and warehousing services for major automotive parts suppliers through the supply chain.

The Firm in Qingdao takes over Haier's distribution business from Qingdao to distribution centers in other regions, and also directly delivers to retail stores. Its logistics centers in other regions can handle freight deconsolidation and re-distribution. Currently the Firm delivers to all Haier's 42 warehouses across the country and its capacity accounts for 60% of Haier's total used transportation capacity.

Hai Qian's main businesses include transportation of machinery and electronics finished goods, warehousing, light processing and production line supply. They do both inbound and outbound logistics. At the same time, Hai Qian has an international logistics park in Huang Dao district to provide integrated services for foreign companies. In recent years one of Hai Qian's subsidiaries has developed the first domestic ocean container transportation line. Hai Qian has prematurely established a logistics system centered in Qingdao port and it expands to the entire Shandong province and areas around the Yellow River. Hai Qian's business strategy is to expand from standard warehousing, transportation and transshipment to import/export customs clearance, vessel and space booking, insurance, transfer customs transportation, warehousing packaging, container consolidation, terminal-to-terminal and door-to-door transportations. Hai Qian has signed contracts with most of the top 20 ocean freight shipping companies. Meanwhile Hai Qian is collaborating with other FIE's (Foreign Investment Enterprises) to do containerized land transportation business. Hai Qian's container logistics business has gained significant growth from a few charters each month in the past to over 130 charters a month today.

CRE utilizes its logistics center in Beijing to provide regional warehousing and distribution services for manufacturing companies. Its logistics center consolidates and sorts freight and then delivers to customers directly.

In logistics services, ZJS has a leading business model in the current China logistics market. ZJS started with freight/parcel pick-up, transit, warehousing, sorting, city distribution and move to nationwide door-to-door delivery. After the door-to-door delivery business had taken off, ZJS followed up with its next day door-to-door services. Now ZJS is developing a regional door-to-door business. With this service, freight is picked up in the afternoon and can be delivered the next morning before 10am or no later than 5 pm the same day. Nationwide ZJS had also started next day delivery and 2-day delivery services. In addition, ZJS had also introduced extended services such as payment upon delivery, and delivery from alternative location. ZJS is the first in the country to develop such service models and it is currently a market leader.

Costs, Charges, Taxes and Profits

Transportation cost in China generally consists of 10 items: toll charges, fuel, wages and benefits, vehicle depreciation, vehicle registration (for public road maintenance), freight transportation registration, vehicle maintenance, tire cost, vehicle insurance and administration charges. It varies across companies depending on specific administration and accounting methods. At this point in time, fuel prices and toll charges are high. Long haul business spends between 20% to 40% of revenue on toll charges and from 14% to 40% of revenue on fuel. Together, they account for more than 50% of business revenue. In comparison, driver wages only account for 3% to 5% of the business revenue. High toll charges have always been a major complaint of transportation companies. The companies determine their charges based on the market conditions. Currently, road transportation service charge is at a historical low level.

Here, we provide information for three categories of companies. All eight companies surveyed are in the third category. 1) Private long haul operators. These operators often piggy-bag freights to increase profits. Their service charges are normally low, around 0.15 RMB-0.25 RMB per ton-mile. Toll charges and gas cost account for 20%-25% and 20% of total transportation revenue respectively. On average, they overload 1 to 2 times of their rated capacity and sometimes can be as high as 3 to 5 times. They gain competitive advantage by overloading, long driving time and low overhead. 2) Truckload (TL) operators. Majority of these are small to mid sized companies. A few large trucking companies also fall into this category. They have a relatively stable customer base and businesses in certain cities and regions. These companies provide raw materials transportation and finished goods distribution services for manufacturing clients as well as retail and trade customers. Their service charge is around 0.25 RMB-0.35 RMB per ton-mile. Toll charges and gas cost account for 25%-30% and 20% of the transportation revenue respectively. Most vehicles are overloaded 1 to 2 times over rated capacity. Low service charge and overloading are the two critical components of their competitive strategy. 3) Network and value oriented operators. All eight surveyed companies are in this category. These are mostly mid to large sized companies and some are small trucking companies. Their services include LTL, regular freight and express delivery, TL express transportation, and small parcel express delivery. Not only do they have more stable business and longer-term customers, but they can also

handle small and individual businesses. Their service charge for this category is higher, around 0.4RMB-0.6RMB per ton-mile. Toll charges and gas cost account for 30%-40% and 20%-25% of the transportation revenue respectively. They rarely overload their trucks. They compete on service quality and reputation. However, low cost competitors from the first two categories post a constant threat and erode their profit margins.

Other major costs higher than those in developed countries include the following. 1) Higher deadhead rate. This is related to a relatively smaller fleet size and network. 2) Inefficient load/unload. In domestic transportation, palletizing, forklifts and conveyerization are uncommon. Small and irregular freights are loaded/unloaded manually and handled at low speed. Most trucks and trailers have flatbed. The manual loading/unloading takes longer time. Although the labor cost is extremely low, the manual process ties up valuable resources such as trucks, docks and inventory. 3) Higher damage rate due to poor packaging. 4) Poorer knowledge of freight movements due to lack of IT or tracking systems.

The service charges are heavily dependent on the region. In a particular region, transportation charge varies significantly by market demand and service quality. The range of transportation charge is around 0.2-0.8 RMB per ton-mile. Piggy-bag freight charge is at a low level. With respect to tax, transportation companies mainly have sales tax and income tax with the former around 3%-5% of the revenue and the latter around 33% of revenue. Currently, the combination of soaring transportation cost and weak pricing power leaves most companies with a very thin profit margin of 2%-5%. The eight surveyed firms all have relatively higher margins. It is very rare for companies to achieve a profit margin in excess of 10% of revenue. Table 3 gives related data from the six surveyed firms.

Table 3 Toll Charges, Gas, Taxes and Profit

	Toll Charge (% of total revenue)	Gas (% of total revenue)	Tax Rate (% of total revenue)	Profit (% of the total revenue)	Average Transportation Charge (RMB/ton-mile)
Hua Yu	30-40	20	3.5-6	10	0.4-0.6
Jia Ji	35	20-25	4-6	10	0.5-0.6
ZJS	20	40	6.4-8.4	5-8	0.6-0.8
The Firm in Qingdao	30-40	20-30	6.6	10	0.25-0.45
Han Dan	27-28	25-30	6	7.5	0.3-0.4
Hai Qian	29-30	14-15	4.3	10	0.27-0.28

IT Infrastructure Development

The organization, system functionality, performance, technology and future plan of IT infrastructure of the eight companies are summarized in Table 4. In terms of organization, there are three strategies observed from the survey: 1) Sophisticated in-house IT department using commercial hardware such as network and server systems. They develop supportive software, provide maintenance and perform upgrade. 2) Coordination IT department. Software development, maintenance and upgrade are outsourced to professional partners with shared copyright. 3) Outsource IT infrastructure. Quite a few of the surveyed firms choose the first strategy as they believe in-house development can best support their growth needs in the future. The second strategy is also a popular choice. For example, part of Hua

Yu's strategic plan for 2004 involved the development of a business information system, and has partnered with Dichain Hong Kong to develop the system.

Most surveyed firms have used browser/server or client/server enterprise network system, transportation management system, warehouse management system and GPS system. Some firms have used barcode, warehouse monitoring technology, decision support system, GSM nationwide roaming communication technology and short text message tools.

When selecting specific information technologies, companies usually make decisions based on business needs and whether the technology can satisfy customer requirements. For example, ZJS makes extensive use of bar code technology; as its major business is small size parcel delivery, which is high volume. CRE also applies bar code on freight tags. After using GPS for some time, CRE decided not to use it anymore. Other 5 firms are still using GPS system. In general, we found not many trucking companies in China use bar code technology and other information technologies. As a result, low efficiency and poor tracking abilities (is visibility the right term for this?) are other reasons leading to higher transportation cost and poorer service.

In terms of IT applications, these firms concentrate on serving their core business, and gradually implement technologies in other business management areas. Most firms have implemented information technology in freight transportation, warehousing and other general business areas. They also have transportation and freight related information available for customers and public to search and track shipments through their websites. Jia Ji and CRE have digitized finance management area. ZJS has achieved a paperless internal business management throughout its branches all over the country. For all the freight it delivers, receipt information from customers is transmitted back to control center through cell phones. At the same time, delivery status is uploaded into database and accessible through internet by company and shippers, thus dynamic freight status tracking can be achieved. Pu Yun also has a PUMA transportation management system which fully supports company's JIT and Milk-Run operations. PUMA is a product of IBM and it supports multiple transportation models including multi-site loading/unloading, JIT and Milk-Run transportation, city distribution and long haul, freight consolidation, backhaul and route optimization. It also provides scheduling plug-in interface and optional intelligent scheduling modules for different operation models. PUMA can calculate the estimated time for critical point of transportation tasks, provide real-time status monitoring for critical point operations and customer-oriented web-based transportation monitoring module. In PUMA, transportation charges can be automatically calculated. It can support large size customers and improve operation processing efficiency.

Among the eight firms, Han Dan does not use modern IT technologies for its traditional regular freight transportation. However, its container transportation and international container transshipment site management and operations have used quite advanced information technology. In its other businesses, various information technologies have been utilized. Company's senior management are aware of the importance of IT in improving business operations and gaining competitive advantage.

Most firms acknowledged that information technology had contributed to business operations and development. They also commented that due to limited skills and external environmental constraints, information technology applications had not achieved its full potential. We observed that most firms have practical expectations and plans for IT system development.

On the other hand, Jia Ji has made huge investment in IT systems compared with other competitors.

Table 4 IT Infrastructure Development

	Organization	Functionality	Performance	Application Technology	Development Plan
Hua Yu	In-house IT department, procure hardware and co-develop software	Office automation. Just started transportation and warehousing operations IT system development, including: shipment and delivery, freight balancing, tracking, route optimization	Office administration system works well. Business operations are in trail run	Network, tracking, optimization and database management technologies	Develop nationwide internal MIS system, and establish an information technology service company
Jia Ji	In-house IT department, procure hardware and self-develop software	Integrated to support all transportation, warehousing, DSS, customer service, workflow management, database and security management areas	Critical to business development and operations.	Network technology, GPS, GSM nationwide roaming communication platform, and short text message	Plan to build an e-business platform that truly suits for logistics business. Will adopt ergonomics network technologies. Will provide customer convenience in placing order and making payment electronically.
ZJS	In-house IT department, procure hardware and self-develop software	Paperless office automation, information system in entire operation	Current system is can meet practical needs and has made significant contributions	Network, GPS, bar code and warehouse monitoring technologies	Develop ERP system
CRE	In-house IT department, procure hardware and self-develop software	IT system used in business operations, finance management and human resource management	Meet company's specific needs and customer requirements. Improved supply chain competitive advantages, and significantly enhanced operation management and customer service capabilities	Network technology, GPS and bar code technologies	Will continue to upgrade the IT system based on business development needs and customer requirements
Pu Yun	In-house IT department, procure hardware and co-develop software	Bonded warehousing, JIT delivery and Milk-Run transportation	Can meet logistics business requirements. Can provide order status visibility through order cycle. Inter-company logistics systems integrated	Customer-oriented, cross-functional, dynamic real-time workflow management platform. GPS system	Will implement IT system to all business areas
Hai Qian	Has subsidiary software company to self develop required software. Purchase hardware	Transportation scheduling optimization, individual vehicle accounting and operation process monitor and control	Optimized transportation management, improved efficiency, reduced cost and improved service quality	Network technology, GPS system (utilize the system from FAW)	Meet practical requirements first, and continue to improve capability
The Firm in Qingdao	Development outsourced	Freight transportation trade platform, distribution IT system integrated with customers, scheduling, shipping/delivery, freight balancing, tracking and searching and optimization achieved.	Good	Network technology and GPS technology	

Service Quality

All eight firms have earned ISO quality certifications. Each company has its own service quality criteria and Standard Operation Procedures, and has established operation monitoring and quality control measures. They have also established processes to prevent and handle freight damage, loss or other exceptions, as shown in Table 5. Each firm has different service quality commitment to different customers. For example, ZJS commits to delivery time, the rate of damage, claim, on-time delivery (OTD) and to return signed receipts to shipper. Table 6 shows service quality metrics set by CRE. It can be seen that the service quality is improving year over year with only two exceptions: order cycle time and freight damage settlement time. Its inventory accuracy is close to 100%. Table 7 depicts a service quality comparison in 2003 among these surveyed firms. Service quality self-evaluation is summarized in Table 8 and it reflects to some degree the average trucking service quality levels in China.

The survey indicates that all firms emphasize on metrics the customers value, such as service charges, delivery time, on-time-delivery and damage rate, and are continuously improving service qualities.

Pu Yun commits to pay \$7,000 penalty for a one-minute delay in delivery to Shanghai Volkswagen and Shanghai GM plants. This commitment demonstrates Pu Yun's superior service quality standard, which stands out in comparison to even the most advanced foreign logistics competitors.

Table 5 Quality Management

	Customer Focus	Operation Process Control	Damage, Loss and Exceptions Precaution
Han Dan	On time delivery	Service standard, responsibility, performance goals and reward/penalty scheme	Bulk commodity, not applicable
Hua Yu	On time delivery, damage/loss rate	Standard operation and performance evaluation	Insurance and process control. Backup with contracted vehicles
ZJS	Delivery window, return receipt to shipper, damage rate, service claim, on time delivery	Standard operation, Quality auditor, on line tracking, GPS tracking, transshipment recording and digitization	Precautions in packaging, loading/unloading, warehouse management, transportation to prevent damage/loss, performance metrics, and bar code technology
CRE	On time delivery, damage/loss rate and freight damage settlement cycle time	Standard operations, Ownership identification, information technology applications	Freight movement signature control. For emergencies, drivers must notify headquarter within 1 hour. HQ will schedule emergency plans. Save customer freight first.
The Firm in Qingdao	On time delivery, damage/loss rate	Competition, quality standard control, performance metrics, CIS company image project	Service operator card, driver performance feedback, customer claim box etc.
Hai Qian	On time delivery Damage/loss rate	Ownership identification, performance metrics and evaluation, performance based reward	GPS vehicle tracking and dynamic scheduling system on vehicles and freight. Alarm system, private back-up vehicles
Jia Ji	On time delivery	Standard operation instructions, process tracking and control, job duty and performance metrics	Pre-alarming system and emergency rescue plans. Network resource to prepare for emergency in closet possible time, normally within 4-6 hours
Pu Yun	On time delivery	JIT、MILKRUN Model	GPS tracking system and dynamic scheduling system on vehicles and freight. Overtime pre-alarming system and network resources for emergency

Table 6 Service Metrics at Beijing CRE

Metric	Standard	2001	2002	2003
On Time Delivery(%)	88%	85%	88%	93%
Perfect Order Fulfilled%	85%	70%	82%	89%
Order Processing Time(Hours)	2	4	4	3
Damage/Loss(%)	0.50%	0.45%	0.43%	0.32%
Inventory Accuracy(%)	100%	99.95%	99.97%	99.99%
Response Time to Claim(Hours)	2		2.5	1.9
Damage Settlement Cycle Time (Days)	7	18	12	10
Emergency Response Time(Hours)	2	2	0.2	0.1
System Inventory Update Time(Hours)				
Daily Data (Report or EDI packets) Response Frequency (Days)	Real time	3	Real time	Real time

Table 7 Service Quality Comparison

Metric	The Firm in Qingdao	Hua Yu	Jia Ji	ZJS	CRE	Average
On Time Delivery(%)	98	80	96	99.88	93	93.38
Perfect Order%	96.1		99-100	82	89	91.65
Order Processing Time (Hours)	2		2		3	2.33
Damage/Loss(%)	0.03	0.50	0.50	0.008	0.32	0.27
Inventory Accuracy(%)	93.6		99	99.50	99.99	98.02
Response Time to Claims(Hours)	0.5	1	2-4	2-4	1.9	1.88
Damage Settlement Cycle Time (Days)	1	7	10~15	15	9.1	9.10
Emergency Response Time (Hours)	2	12		4-6	0.1	4.78
Inventory Update Time (Hours)	2		Real time		2	2
Daily Response Time (of Tables or EDI packets)	10				Real time	

Table 8 Competitors and Service Quality Self-Evaluation

	Major Competitors	Service Quality Self-Evaluation
Han Dan	Transportation Department in Han Dan Steel Plant in regional market	Leading among regional players
Hua Yu	As one of the largest road logisitcs companies	Good service quality, average speed
ZJS	China Post、 CRE、 Da Tian	Good service quality, delivery time guaranteed
CRE	Beijing Rail, Hua Yu, ZJS, Jia Ji	Good service quality, high value to price ratio
The Firm in Qingdao	No competitors in regional market	Leading in domestic market
Hai Qian	No competitors in regional market	Leading among other competitors
Jia Ji	As one of the largest network logistics companies, no major competitors	Leading among other competitors

Pu Yun	No competitors in regional market	Leading among other competitors
---------------	-----------------------------------	---------------------------------

It is notable that all the managers we surveyed had complained about the packaging quality of domestic goods. Most of the domestic shippers pay less attention to freight packaging. The packaging quality is far inferior compared to what international shippers are using. This is a major reason for freight damage. Most trucking companies have insured significant amount for the freight that they carry. For example, CRE has insured 3 billion RMBs for the freight it delivers. An important reason that caused long claim reimburse time is the time taken to assign responsibility, determine severity of damage and validate damage value, which can take from 1 to 2 weeks.

Customer Relationship Management

All firms recognize the importance of customer relationship management. Table 9 gives the major strategies of these firms on how they manage their customer relationships. Each firm dedicates customer relationship management to a unit such as department of marketing, sales center, or customer service center, claim and settlement center. The two major functions of the customer service organization are new customer development and customer management. We have noticed certain commonalities from the surveyed firms. For example, all firms have customer driven strategy and strive to develop customized services. They all value service quality and take it as the most critical factor to retain existing customers and develop new customers.

All firms pay a great deal of attention to serving big customers. They have a set of customized service schemes specially designed for these customers. For instance, CRE has a dedicated team for customers with annual account over 10 million RMBs. They classify those with million RMBs annual revenue as big customers and others as small customers. Different priority are set for different customer categories in terms of vehicle scheduling, piggy-bagging and other services.

All firms tend to pay attention to customer complaints, questions and requests. They are constantly improving their service attitude and developing better solutions to enhance customer satisfaction.

Each firm is flexible in taking advantage of its brand, reputation, price, network, information service and customer network to develop new customers. We observed that marketing is playing an increasingly important role in this regard.

Table 9 Customer Relationship Management

	Customer Relationship Management	Customer Satisfaction Evaluation	Customer Claim Solutions	Customer Development
Han Dan	Customer oriented and quality services. On site visit and regular conversations.	Customer satisfaction survey including transportation quality, service attitude and efficiency	No complaints so far. Regular on-site visit and conversations	Provide quality service and reasonable price. Emphasize reputation and brand in developing new customers
Hua Yu	1. Establish customer profile. 2. On-site visit schedule. Marketing & Sales team and delivery team directly contact customers. 3. Manager level conversation with customers.	Evaluate through claim rate metric: number of claims per million-RMB revenue. Focus on problems with high claim percentage and provide solutions.	Implement "One-stop" service with one single contact for the whole claim. Managers keep cell phones open 24 hours for claims. Regional HQ has claim & settlement center	On-site visit and advertise. Provide quality service at reasonable price. Good reputation and strong operation network has significant impact on new customer development. No big customer changes in past five years.
ZJS	HQ and subsidiaries/branches all have customer service department. Dedicated service team for big customers	Service Quality Survey	Three layer hierarchy to solve claims: from branches, subsidiaries to parent company	Marketing & Sales center survey to understand customer needs including delivery time, packaging, volume, region, security etc. Project manager in charge of big projects
CRE	Quality first. Dedicated project team for projects over 10 million RMBs. Customization services with priority differentiation. HQ has sales dept and customer service dept. Each branch has dedicated person in charge.	Quarterly customer satisfaction survey including speed, damage, loss, attitude and information etc. Demand total customer satisfaction above 90%. Satisfaction criteria: contract completed with no claim	General claims handled by HQ. VIP customers will be reimbursed first. Sales department and customer service department take claims, make claim settlement and deal with big customers	Use different techniques such as service quality, reputation, customer network, experience, low price trail run, insured service etc. in customer development. In past five years, customers changed gradually from SOEs to foreign firms, JVs and non-SOEs. Book business is shrinking and IT business is increasing.
The Firm in Qingdao	Customer profile and on-site customer visit.	Customer satisfaction survey	The problem is many customers only focus on price, not value-added services	Brand and reputation
Hai Qian	Service quality guarantee, introduce customer business models to make sure deliver what customer needs	Managers keep close conversation with customers	Regular conversation and counseling to solve problem at early stage	High value at low price
Jia Ji	General and VIP customer differentiation. Equip dedicated team for VIP customers. On-line conversation and customer service center	Customer service center record and surveys on VIP customers. No fixed forms. Also customer loyalty is studied.	Service hotline is available and received by customer service center. Precaution and post-accident plans are established. Monitor and control quality issue prone steps to prevent from happening. Company and branches all have service center to take and solve claims.	Did not do much on new customer development. Buyer's market. Jia Ji carefully selects customers to ensure right customer base.
Pu Yun	Customer centered service objective. Provide multiple claim services and "one-stop" service. Regular on-site customer visits.	Customer satisfaction survey including on time delivery, accuracy, security and price metrics. Ensure customer satisfaction over 98%.	Commitment: submit a written preliminary investigation report within 36 hours after claim is received. Have conversation with customers and listen to their questions. Try to achieve 100% claim processed and on time. Provide multiple claim channels including by phone, internet, fax etc.	Sales department has business development and solution support department. Sales managers visit potential customers to understand their needs, introduce self and keep contact. Develop competitive solutions to attach market with capability and service.

Enterprise Resource Management

In the survey, we investigated human and physical resources management. Table 10 lists human resource strategy for 6 surveyed firms. It can be seen that JVs and non-SOEs (10%) have a much lower percentage of managers compared with SOEs (23%).. Most firms have managers with advanced degrees. The percentage of employees with vocational education is between 13% and 33%, with an average of 22%. The lowest percentage of managers with vocational education, technical degrees or above is 22% and the highest is 74%. The average is 35%. Among the managers of the 5 firms, percentage of technical personnel with technical degrees can range from 10% at the lowest to 69% at the highest, with an average of 25%. Overall, The Firm in Qingdao has the highest percentage of managers with higher education and employees with the most professional experience. Also noticeably Hua Yu has over 6,000 employees from the North and over 3,000 were laid off from their jobs in the city of Jia Mu Si and are known for their love for their job and hard work.

Table 10 Human Resource Summary

	Hua Yu	CRE	The Firm in Qingdao	Han Dan	Pu Yun	ZJS	Average
Total Employees	9144	3300	16000	3998	1423	6600	6078
Advanced Degree (%)	0.02	0.15	1.44	0.00	0.07	0.02	0.28
College Degree(%)	0.33	0.82	6.88	1.73	0.63		2.08
Associate Degree(%)	3.51	6.97	5.75	7.46	4.08	30↑	9.63
Vocational (%)	14.61	25.45	4.88	6.97	8.43		12.07
Managers(%)	10.63	7.58	18.75	26.76	24.67	12.02	16.74
Senior Mgt or Engineering Certification (%)	4.9	0.40	28.67	2.93	0.32		7.44
Mgt or Engineering Certification (%)	12.7	2.40	40.00	24.34	9.21		17.73
Entry level Mgt or Eng Certification (%)	4.22	7.60	18.00	41.71	32.70		20.85
Managers with Advanced Degree (%)	0.21	2.00	6.67	0.00	0.32	0.25	1.58
Managers with College Degree (%)	2.88	10.80	36.67	5.56	2.86		11.75
Manager with Associate Degree (%)	24.49	44.00	30.67	21.72	18.41	65↑	34.05
Managers with Vocational Degree (%)	72.42	29.00	26.00	17.07	20.63		33.02
Drivers (%)	15.66	16.06	12.50		24.53	18.18	17.49
Technicians (%)	3.12	1.42	10.00				4.87

Note: Percentage for Managers is based on the total number of managers. Other percentage figures are based on the total employees 30↑、65↑ are for percentage of people with above Associate degree.

A few fast growing firms feel that the current employee growth cannot keep up with business development. The following solutions are commonly used: 1) recruiting people from outside of the company; 2) providing professional training to employees; 3) building a good recruiting and promotion strategy; 4) developing an environment for career development for employees. All surveyed firms have given employee development great emphasis. They all believe in retaining people with the right reward and career development opportunity.

Hua Yu's strategy is to establish an employee training and development system and leave employees with opportunity for growth. Hua Yu is currently facing a manager shortage and it is mainly promoting from inside and also recruiting from outside. Hua Yu's training is conducted at the operations and management levels. At the operations level, standard operation procedures and performance metrics are setup for each step of the operations. Operation metrics must be achieved and continuously improved. Operators are assigned mentors at first and second level branch companies and they must pass rigorous job exams. Those who cannot pass the exams will be removed from the positions. At the management level, Hua Yu has corporate training centers with professional speakers. Training is available every year from headquarter to all branches.

Jia Ji recruits more than 1,000 new employees every year. The new employees are recruited from accredited institutes and will need to receive comprehensive training in basic operations, regulations and safety at corporate training center before starting work. When they start, company assigns mentors to help them grow. For key positions, professional training is provided on a regular basis. An example of such a position is vehicle dispatch and scheduling as it has direct impact on transportation cost and route optimization. There will be one or two annual trainings for such positions to ensure quality at these critical positions. On the other hand, current managers must attend annual trainings. For those employees with recognized performance, Jia Ji gives them opportunities for management positions.

The Firm in Qingdao does not have an in-house training center. Instead, it has a transportation vocational school that jointly sets up a training center with Shandong Labor and Social Security Department. In recent years The Firm in Qingdao has employed well trained logistics professionals such as 15 senior managers with MBAs from Australia Sydney University, four logistics graduate from Hong Kong Science and Technology University, and more than 200 employees with over 10 years logistics experience. The Firm in Qingdao has also formed extensive partnership with Korea Han Jin Logistics Institute, HKUST Logistics Management Department, China Logistics Association Logistics Institute and Logistics Research Center in Nan Kai University.

Many people in ZJS had served in the military. ZJS's employees have degrees from high school to MBA, and they come from three main areas: industry, institutions and military. Promotion is based on training and performance, and people will move up and down the corporate ladder depending on performance. ZJS has a school in Xiang Mountain where managers and best performers are trained every two months by headquarter. . ZJS also has an attractive strategy to recruit and retain employees. First, its employees enjoy an average wage of 20%~50% higher than competitors. Second, managers have greater promotion opportunities due to high growth rate. Third, ZJS has a performance-based reward system and a friendly work environment.

Pu Yun recognizes the challenges from MNCs in terms of advanced operations and service standards, and is driving all employees from managers to operators to adapt to modern logistics practices through daily services and self-study groups.

In CRE, promotion and reward are based on performance.

Table 11 summarizes equipment and facilities of the eight firms. It is notable that the four fast growing network-based firms have a big shortage of vehicles and space. They urgently need to add more warehousing facilities to keep pace with their network expansion. In recent years, Hua Yu invested mostly in operation network and the associated yard and facilities. It follows a light-asset development strategy and relies more on integrating industry resources to maintain sufficient capacity. Hua Yu has 2100 contract vehicles to support its highway network operations. Similarly, ZJS outsources its highway transportation and uses its own fleet for major lanes and city distributions. Jia Ji uses its own private fleet on highway transportations and has no plan to add more vehicles. It also considers integrating vehicles in other sources. It is also notable that most vehicles in these companies are enclosed (box) despite the fact that most vehicles in China trucking industry are flatbed. In warehouse, floor storage is still the norm and few modern warehouses are in use, let alone modern material handling equipments. Among the eight surveyed firms, The Firm in Qingdao formed a joint venture company with Shandong Hai Feng Ocean Shipping Group and Panama Ocean Shipping Company. The JV has built the state-of-the-art Qingdao Qian Wan International Logistics Industry Park and an international container multi-modal transshipment station (Han Dan Shunda International Container Transportation Ltd.) together with Han Dan. The idea is to position itself as an integrated regional international logistics at the intersection of Shanxi, Hebei, Shandong and Henan.

Table 11 Equipment and Facilities

Hua Yu	1370 trucks: 1250 (<5 ton), net asset 57.8 million RMBs, 2100 contract trucks; 8 city logistics centers and operation sites; Total warehouse area 166070 m ² .
Jia Ji	800 box trucks, 300 long-term contract vehicles, 150 forklifts, warehouse 137,000 m ² , operation area 600,000 m ² .
ZJS	1175 trucks with 900 (<5 ton); 7 logistics bases and operation sites; Total warehouse area 60,000 m ² .
CRE	512 box trucks with net asset 79.45 million RMBs. 10 big sorting centers and warehouse area of 50,000 m ² for all operation sites. Total storage yard area 50,000 m ² .
The Firm in Qingdao	5000 trucks, total warehouse area 28,846 m ² , storage area 216,565 m ² , fixed asset net value 142.68million RMBs. In addition, international logistics park area 1,000 mu , warehouse area 10,000 m ² , container storage yard area 60,000 m ² , 2 international container yard/stations with 20,000 m ² area.
Han Dan	2000 trucks: among them 1280 large trucks, 19 container tractors, 15 special trucks and total payload weight 43,000 tons. Net vehicle asset 62.04 million RMBs. Warehousing area 5,118 m ² , storage yard area 78,312 m ² in which container warehouse area 2,658 m ² and storage area 11,669 m ² . Inland port building area 3,840 m ² . Fixed asset value 91.06 million RMBs.
Pu Yun	784 trucks in which 180 are bonded trucks, 98 swing open door trucks, 96 trucks with pulling qualifications
Hai Qian	188 large trucks, 11 warehouses with total area 20,000 m ² . Parking lot area 1.5 m ² .

Each firm has its own intangible but invaluable asset. For example, the Firm in Qingdao registered the first trademark ever in the China trucking industry “Care in the Trip”. It enjoys excellent brand recognition in Qingdao city and Shandong province, and has been rated as “Customer most satisfied service” by China Quality Association Customer Committee. China Brand Times says it is the No. 1 brand of China trucking. Pu Yun was rated by State Administration for Industry and Commerce as “Creditable Company” for 10 consecutive years by the Shanghai city administration of industry and commerce. Its parent company Shanghai Jiao Yun Group is a well-recognized company in trucking industry. Han Dan has over half a decade history and its brand is well known across the country. Among the eight

companies surveyed, five companies with less than 10 years history are also building solid brand recognition and reputation along with rapid business growth. “Hua Yu Logistics” and “Jia Ji Express” have become respected large network-based logistics companies in China, and “ZJS” have well recognized brand in the express delivery industry. ZJS also puts standard icons on all their trucks, operation sites and employee uniforms and present a professional image to customers. CRE has registered a “Flying Panther” trademark and it is an unusual move among its peers. Hai Qian is a small sized company but it was widely recognized for its quality services.

Company Organization Structure and Business Model

There are three types of organizational structures among the eight surveyed firms. The first is a network-based large sized company. Hua Yu exemplifies one such company. The organization is structured along two dimensions. The first dimension consists of operational units that perform transportation, warehousing and distribution services. They are responsible for ensuring the performance of tasks throughout the entire operations. The second dimension is organized along functional lines that provide support services such as planning, information services, finance and accounting, human resources, market development, administration and customer relationship management. Therefore the first type of organization structure is a matrix that has characteristics of a centralized control center and multiple operation centers with the system fully integrated. It adopts the headquarters and branches hierarchy. Headquarter centralizes management and delegates business operations. Only one profit center is established with other organization/departments as execution systems and cost centers. With this type of structure, business operations are standardized and integrated from marketing and sales, solution development, operations and customer services. Operations at local branches and company logistics facilities are connected in a systematic approach. Customers can enjoy “one-stop” services nationwide. In addition, company has an integrated information system between headquarter, local branches and logistics facilities. Information is shared between them and paperless business can be achieved. The system can also be integrated with external customers, suppliers, carriers and end users. Centralized information searching and status tracking are available.

The second type is a decentralized structure with autonomous business units. The units are established based on a centralized strategy, decentralized management principle. Each unit is an independent entity to do its own business according to centralized business plans, goals, budgets and performance metrics determined by headquarters. Each unit is an individual profit center, and has relatively independent marketing and sales authority. Headquarter controls and manages the units to a limited extent.

The third type is a hybrid model which combines above the functional areas with business units. This model has the advantages of both models in that it can implement direct functional control for certain businesses, and also set up autonomous business units to increase flexibility between centralized management and operations.

Core Competency Analysis

We analyze business competencies from two angles: competitive core competency and sustaining core competency.

We view the competitive core competency from both a macro and micro level. From a macro level, we consider whether these firms should focus on their core business and assess if they have an edge over other competitors. At the micro level, we assess their competency in terms of product and services, geographic coverage, customer and resource profile. The result of the analysis is shown in Table 15. Among the eight firms surveyed, Hua Yu positions itself in the regular freight LTL and express delivery trucking business for low to mid market customers. Backed by the largest road transportation network it has established across the country, Hua Yu possesses a strong competitive advantage in providing quality services at low cost. Jia Ji's core business is also in the regular freight transportation field. It targets high-end customers in LTL and express delivery market, and has strengths in its state-of-the-art management information system and nationwide road transportation network. Compared with Hua Yu and Jia Ji, ZJS concentrates in the express delivery business. Its major competitors are China Post, CRE and Tianjin Datian. ZJS has the largest JV network across the country, second only to China Post. Equipped with advanced information system, ZJS is able to offer high quality services at lower cost. Its presence in the express parcel delivery market is considerable. Among the surveyed firms, CRE in Beijing concentrates in road and rail logistics transportations with air transportation as its supplementary business. CRE has dedicated road and rail network lanes and state-of-the-art database management information system. It offers high value services for domestic freight market and its strengths are well recognized in the industry. The Firm in Qingdao, on the other hand, has a business in four major segments: long-distance bus services, logistics, real estate and vehicle repair/maintenance. In logistics industry, it has the advantage in its history, brand, service policy, technology, transportation organization, land resources and business size in the Shandong and Qingdao areas. It has formed alliances with well-known domestic and foreign logistics companies and boosted its overall business capacity rapidly. In the regional logistics market, the Firm in Qingdao has a dominant market position. Han Dan's core businesses include long-distance bus service, freight transportation, vehicle trade/repair/maintenance. In regional freight transportation market, this company has well established performance records, brand, service policy, technology and equipment, organization, land resources and size. It is strong in the Hebei and Handan areas. Pu Yun in Shanghai has main businesses which include contract transportation, automotive logistics and distributions. Pu Yun has a longstanding reputation in the Shanghai area. It has the advantage of a known brand, service policy, technology and equipment and transportation organization in the Shanghai areas. At the same time, Pu Yun also collaborated with well known domestic and international companies to improve its logistics capability. As a result, it is gaining strength in the regional logistics market. Lastly among the eight surveyed firms, Hai Qian at Qingdao focuses on long haul business in trucking industry. It provides transportation, warehousing, light processing and distributions, and it mainly serves large sized firms in home appliances and automotive manufacturing industries. Hai Qian has constructed regional transportation networks around these big customers and provides quality service at low premiums to customers. Hai Qian has considerable strength in the 3PL industry. Finally, it is notable that Hua Yu, Jia Ji, ZJS, CRE and Hai Qian have very focused core businesses while the other 3 firms have more diverse business portfolios.

Table 12 Competitive Core Competency

	Core Business	Product	Region	Customers	Resource Advantages	Competitive Advantages
Hua Yu	Freight trucking	LTL and Express delivery	Nationwide	Low end to mid end customers	Largest transportation network	Significant
Jia Ji	Freight trucking	LTL and Express delivery	Nationwide	Mid end to high end customers	Large transportation network and advanced MIS	Significant
ZJS	Express delivery	Door to door express delivery	Nationwide	Businesses and individuals	Air, road express delivery network and advanced MIS	Significant
CRE	Transportation and warehousing	LTL, Express delivery and warehousing	Nationwide	Businesses and individuals	Road and rail express delivery network, and advanced MIS	Noticeable
The Firm in Qingdao	Integrated logistics	Integrated logistics	Shandong Qingdao and other provinces	Large domestic firms and international customers	Brand, strategy, technology and equipment, land resources	Significant
Han Dan	Road freight transportation, Container yard businesses and transportation	Raw materials transportation, container yard businesses and transportation	Hebei, Handan and vicinity provinces	Steel manufacturing, power plants and industry and commerce firms	Brand, strategy, technology and equipment, transportation business structure, human resources	Noticeable
Pu Yun	Trucking	Bonded transportation, MILKRUN, JIT transportation, city distribution, long haul	Shanghai, Jiangsu, Zhejiang and other 40 cities across the country	Prestigious domestic and international firms. Bonded transportation, automotive and components manufacturing	Brand, strategy, technology and equipment, transportation business structure, advanced MIS	Noticeable
Hai Qian	Long haul	Transportation, warehousing, processing and distribution	Qingdao, Changchun, Dalian, Chengdu, Mianyang	Automotive and home appliances manufacturing	Transportation network, technology equipment and warehousing facilities. Advanced MIS	Noticeable

Sustaining core competency is harder to quantify or define. It denotes the ability of a firm to continuously recruit competitive personnel, integrate knowledge and experience, promote

organizational learning and provide value to customers. This competency is key to sustaining competitive advantages and expanding business opportunities.

Hua Yu’s core sustaining competencies are in road transportation network design, planning and operations management. They have foreseen the potential value of the transportation network in the trucking business, and created a “growth with borrowed resources” strategy. Hua Yu adopts the corporate mission of integrating valuable human, transportation and warehousing resources from across the industry. For example, Hua Yu has hired lots of unemployed but hard-working workers in Northeast China. It also adopts a light-asset development strategy and diligently focuses on network development. In the early half of this year Hua Yu’s operation branches have increased by over 10% and it has by far the largest road transportation network among all China trucking companies. Along with “growth with borrowed resources” strategy, Hua Yu achieves quality service through customer relationship management, respecting drivers and others who deal with the customers. Through deliberate corporate culture and policy design, Hua Yu has established a flat organizational structure that fosters creative, strong execution capability in its employees as well as adaptive management and operations team. It is capable of offering more convenient and responsive services for customers, and has demonstrated the ability to sustain these competitive advantages. As a result, Hua Yu has grown from a small company to a company with the largest transportation network in China in eight years.

The core competency analysis for the eight companies is shown in Table 13. We have also interviewed with mid and senior level managers of each company to understand their self-assessment to core competencies. The results are shown in Table 14.

Table 13 Core Competencies

Hua Yu	Transportation network design and operations capabilities
Jia Ji	Transportation network and MIS system design and operations capabilities
ZJS	Express delivery network and company MIS system design and operations capabilities
CRE	Road and rail transportation network and company MIS system design and operations capabilities
Hai Qian	3PL, road network and warehousing design and operations capabilities for large size customers (manufacturing companies)
Pu Yun	3PL logistics and supply chain design and operations capabilities for automotive and associated components manufacturing and port bonded transportation business

Table 14 Self-Evaluation (In comparison with other competitors)

	Position in Trucking Industry	Management	Service Quality	Growth Perspective
Han Dan	Dominant in Handan regional market	Good	Good	Good
Hua Yu	Leading in industry	Very good	Good	Good
ZJS	Leading in market, revenue, brand and business model in industry	Good. Distinguished corporate culture and high employee loyalty	Good	Very good. Seek cooperation with French Post and TNT
CRE	Elite company in Beijing region	Good	Good	Good
The Firm in Qingdao	Dominant in Qingdao. Leading in trucking industry	Good	Less competitive compared with COSCO or Sino-Tran, but better than other peers	Good
Hai Qian	Elite company in Qingdao region	Good	Very good	Very good
Jia Ji	Leading in industry	Very good	Very good	Optimistic
Pu Yun	Elite company in Shanghai	Good	Very good	Optimistic

Business Strategy

First, we present the ranking of internal and external impact factors by the leader from each firm in Table 15. The ranking reveals the extent to which these factors drive business success in the current market and economic environment.

Table 15 Importance of Factors Impacting Business Success

Han Dan	1、 Service Quality; 2、 Company System; 3、 Corporate Structure; 4、 Logistics Facilities; 5、 Operations Network; 6、 Finance Capacity; 7、 Corporate Culture; 8、 Brand Image; 9、 Technology Equipment ; 10、 MIS
Hua Yu	1、 Management Team; 2、 Operations Network; 3、 Company System; 4、 Service Quality; 5、 Corporate Culture; 6、 Brand Image.
ZJS	1. System; 2. Talents and Management Team; 3. Brand Image; 4. Operations Network; 5 Logistics Facilities; 6. Technology and Equipment; 7. Financial Capacity; 8. MIS; 9. Corporate Culture, the real underlying core competency of the firm and cannot be easily emulated by other competitors.
CRE	Brand Image ; Marketing Capacity ; Service Quality ; Management Team ; Operations Team ; Sales Capacity ; Company System ; MIS ; Technology Equipment ; Financial Capacity ; Corporate Structure ; Logistics Facilities ; Corporate Culture; Others.
The Firm in Qingdao	1、 Management Team; 2、 Operations Network; 3、 Brand Image; 4、 Service Quality; 5、 Corporate Culture; 6、 MIS.
Hai Qian	1、 Technology Equipment; 2、 Service Quality; 3、 MIS; 4、 Operations Network; 5、 Company System; 6、 Financial Capacity.
Jia Ji	1、 Management Team; 2、 Corporate Culture; 3、 Service Quality; 4、 Brand Image; 5、 Technology Equipment; 6、 MIS; 7、 Logistics Facilities.
Pu Yun	1、 Service Quality; 2、 Management Team; 3、 Marketing Capability; 4、 Technology Equipment

We have paid special attention to the four newer companies: Hua Yu, ZJS, Jia Ji and CRE. They all strive to become professional logistics companies. We found these four companies consistently focus on their core competencies in logistics services and plan to continue in the future. Their marketing strategies, short term goals, long term plans and strategic measures reflect their clear development objectives. For example, ZJS aims to be the “FedEx” of China. Its goal is to have 75,000 employees, 25 airplanes, 25,000 vehicles and 2,600 branches to cover over 10 countries by 2014. By then, ZJS expects to process 2.1 million parcels per day and its annual revenue will reach 2.2 billion USD. On the other hand, Pu Yun and Hai Qian also have a well defined development plan to be professional logistics companies.

The Firm in Qingdao has also laid out a comprehensive future business plan. As one of the eight modern logistics prototype firms selected by China Ministry of Communications and a traditional transportation company with a long history, it faces many challenges in transforming itself into a modern logistics company. It is leveraging its existing businesses and assets to form regional streamlined checkpoints. It tries to connect to international logistics networks and has built an international logistics park to attract several big-name international logistics companies. It has also built a center in free trade zone to handle assemble-to-export, inbound material processing and international transshipment. Recently, it has formed a JV with a Japanese company at an old port area and built a large warehouse to do textile processing and export back to Japan. The Firm makes strategic use of its international partnerships as well. It only partners with strong foreign company with complementary businesses. As a result, the Firm is able to extend its business supply chain through such partnerships. In the domestic market, it also has partnerships with big

companies such as Haier, Hisense, Aucma, Qingdao Beer and Qingdao Rubber in comprehensive logistics services such as transportation, distribution, freight forwarding, warehousing and deconsolidation. It expects this partnership strategy will eventually strengthen its overall logistics capability and propel it to be the top regional integrated logistics service provider. However, as we have observed, the Firm in Qingdao and Han Dan are traditional transportation firms operating in diverse fields. In the short term, it is difficult to predict whether these two firms will continue with this diversified strategy or if they will shift their focus back to logistics services.

We have analyzed the information we collected from some of the surveyed firms and organize our findings according to the short term, mid term and long term goals of the surveyed firms in Table 16.

Table 16 Business Development Strategy

	Short Term Goal	Mid Term Goal	Long Term Goal
Hua Yu	Revenue increases by 29.4% in 2004; Anticipated profit margin 12.38%; 160 new operation sites; 120 million RMBs capital input in fixed asset; Develop advanced company MIS system.	Continue on resource integration to serve low to mid end customers in trucking businesses. Achieve revenue 2.5billion RMBs by 2010 and build 1500 operation sites. Cover over 600 cities and establish 15 modern logistics centers in mid and big size cities.	To be the No. 1 in China trucking industry
ZJS	Go public in 2005 and become the top tier express delivery company in China. Expand business in Tianjin, Hebei, Yangtze River Delta and Pearl River Delta regions.	Narrow the gap with China Post and CRE. Focus on express delivery and logistics distribution. Also do international express delivery business.	To be a modernized logistics group company. Become “FedEx” in China
CRE	Expand business through supply chain processes. Prepare to go public in Singapore next year	Expand business coverage from three major logistics circles in East to regions in Middle and Western China, including Wuhan, Zhengzhou, Shijiazhuang, Ulumuqi etc. In mid to long term, will integrate into outbound and distribution logistics. Will become a competitive 3PL in distribution area.	Grow internationalized and partner with international logistics companies. Provide highest value/cost services and a few world-class lanes and networks
Hai Qian	Establish a subsidiary in Xian and Northeast China to start constructing network	Become a professional 3PL and mainly serve SOE customers.	Become a professional 3PL.
Jia Ji	Improve professionalism through digitization. Strengthen internal management and service quality. Focus on mid to high end customers	Create standards to become professionalized and standardized. Focus on high value added service, high quality service and high premium service for mid to high-end customers	3PL for mid to high end customers
Pu Yun	Build integrated logistics management platform	Develop rapidly to be a famous trucking company in China	Grow rapidly and become a famous trucking company in China.

Most surveyed firms view establishing joint ventures with foreign companies as a critical part of the company’s development strategy. Firms also choose to do so to increase financing channels, improve management performance and prepare for the impacts of China’s WTO

accession on the logistics industry. Table 17 summarizes how the surveyed firms plan to finance their expansions

Table 17 Financing Strategies of the surveyed firms

	Financing Channel	Partners	Development Plan
Han Dan	Regular bank loan and loan from World Bank Group	Currently None	Establish partnership
Hua Yu	Regular bank loan	Highway transportation carriers. Is negotiating with potential partners and expect foreign capital investment	Expect to cooperate with domestic and international VC
ZJS	Regular bank loan and joint venture	Highway transportation carriers	
CRE	Regular bank loan. Seek strategic investment partners	China Post. Is negotiating with potential partners and expect foreign capital investment	Prepare to go public and is seeking strategic investment partners. Expect partner has strong capital capacity and world-class management to bring logistics talents
The Firm in Qingdao	Regular bank loan, Joint Venture	Has formed joint venture partnership with domestic and international companies	Cooperate with international big companies to provide international logistics services. Cooperate with domestic big companies to provide regional logistics services. Cooperate with distribution logistics companies to provide express delivery services.
Hai Qian	Regular bank loan	Trucking carriers	Plan to form partnership
Jia Ji	Regular bank loan	No partnership plan	No plan for financing or selling stocks. Grow all by self.
Pu Yun	Regular bank loan	Information system development. Seeking partnership	Undergoing SOE restructuring.

CONCLUSION

The high cost of road transportation in China has its underlying reasons. The companies we surveyed have dealt with these reasons in different ways. Some companies depend on improving internal efficiencies within the company. Others rely on the improvement in the overall infrastructure in the country such as unit load, freight tracking while others depend on government regulations and enforcement of road toll. Due to the widespread overloading practices of the small and low cost operators, it is extremely difficult to compete with them on cost alone. Since June 20th 2004, seven government organizations including *Ministry of Communication have formed a work group to crackdown on overloading cases in transportation industry nationwide. The goal of the work group is to effectively curb overloading practices within one year, and eradicate such problems with comprehensive efforts in three years. The major actions include: setting up designated inspection stations, standardizing load limits and inspection criteria, imposing fines, re-inspecting truck capacity and regulating truck manufacturing to stop fraud, cracking down illegal vehicle remodel companies, standardizing truck dimensions, axle loads and weight limit. By August 2004, overloading cases have decreased dramatically and industry transportation premium is curving up steadily - good news for those sustainable companies. More large capacity trucks are being used. In the meantime, it has also been suggested that the government should adopt a market-based solution to the toll charge and associated problems to meet supply and demand conditions.

China is seeing significant evolutions in the logistics industry. A number of companies are developing rapidly while adapting to an increasingly open economic environment. They emphasize modernization, corporate culture, service and brand building. At the same time, these companies also focus on their core businesses, build core competencies, and develop competitive advantages to expand their businesses. Overall these firms are capable of providing higher quality logistics services to customers. These firms are aggressively seeking domestic and international partners to bring in advanced information technology, improve management skills and compete for opportunities and market shares. In this process, these firms have essentially helped to enhance and optimize mainstream 3PL provider structure and capabilities in China.

We also observed that as China logistics market is at its early development stage with significant regional imbalances. The market potential and opportunities are abundant and will continue to attract both domestic and international investors.

PARTICIPATING INSTITUTIONS AND AUTHORS

Northeastern University in China (<http://www.neu.edu.cn>) and Qinhuangdao Campus

Located in Shen Yang, China, Northeastern University is a nationally acclaimed university with outstanding academic programs in the engineering, sciences and social sciences. It has a branch campus in Qinhuangdao, a port and logistics hub to the northeastern China. (<http://www.neu.edu.cn>.) The Qinhuangdao campus is under direct administration of Northeastern University and accepts applications from all over the country.

The Logistics Institute – Georgia Tech

The Logistics Institute (TLI) is Georgia Tech (<http://www.tli.gatech.edu>) has received widespread industry recognition as one of the premier institutes for education and research in logistics. TLI's logistics mission is three-fold: It begins with ground breaking research that is creating the next generation of logistics knowledge. The Institute's logistics curriculum and professional courses reflect this new knowledge, which is applied to the real world through joint industry/academic practice. The Logistics Institute was established in 1992 to coordinate all logistics-related activities on the Georgia Tech campus. Today, TLI is in partnership with the National Science Foundation and more than 18 corporations and government agencies known as TLI's Leaders in Logistics. The School of Industrial and Systems Engineering at Georgia Tech is a natural home for an Institute devoted to advancing the design and application of new logistics technology and practices.

Authors

LIU Xiutian

LIU Xiutian is a Senior Economist and Senior Engineer. He has a master degree in management science and engineering from Xian Jiaotong University. He is currently the deputy director of the Qinghuangdao Transportation Management Department and the president of Qinghuangdao Commercial Transportation Association. He is also a professor in Northeastern University in China at Qinghuangdao campus. He is also an adjunct graduate advisor in Yan Shan University and a member of Hebei Road Institute Expert Committee. He has been a visiting scholar at TLI and ISyE in Georgia Institute of Technology in USA. Professor Liu's primary research fields include communications and transportation engineering and management, trucking industry and enterprise development strategy. In recent years, he also focused his research on supply chain management and logistics management information system. In the past 20 years, he has presided and participated in research and validation for around 20 research and engineering projects. Some of the projects have won advanced technology awards from government. Professor LIU has abundant experience in trucking industry and enterprise management practices.

Jim DAI

Dr. Jim Dai is a professor in the School of Industrial and Systems Engineering at the Georgia Institute of Technology. During the last 15 years, he has done extensive research and consulting in performance analysis and control of complex manufacturing systems, service systems, and computer communications networks. In recent years, he has also focused his research on supply chain management and logistics. Dr. Dai has been an associate editor for four leading academic journals, including *Operations Research* and *Management Science*. He has received numerous honors and awards, including the Young Investigator Award from the National Science Foundation and the Erlang Prize from the Applied Probability Society of the Institute for Operations Research and Management Sciences (INFORMS). He received his Ph.D. degree from Stanford University.

Yuepeng LI

Yuepeng Li is a process engineer at Quanta Manufacturing Nashville. He is a member of APICS (Association for Operations Management) and is certified in Production and Inventory Management (CPIM). He is also a board member of Middle Tennessee APICS chapter. In addition to APICS activities, he is also active in Middle Tennessee CSCMP (Council of Supply Chain Management Professionals) roundtable. He has a master's degree in Manufacturing Systems and Logistics from School of Industrial Engineering at Georgia Institute of Technology.

Yang WANG

Yang Wang is a professor and the associate chair of the School of Mathematics at the Georgia Institute of Technology. His research interests are broad, including wavelets, dynamical systems, harmonic analysis, mathematical finance, signal processing, and computer imaging. He has devoted some of his recent research interest to supply chain management, particularly logistics in China. Professor Wang received his Bachelor's degree

from the University of Science and Technology of China in 1983, and his Ph.D. in mathematics from Harvard University in 1990 under the supervision of David Mumford. When he is not doing research, he likes reading, humor, and sports.

Nancy WONG

Nancy Wong is an assistant professor in the DuPree College of Management at the Georgia Institute of Technology. Her research interests include survey research methodology and consumer decision models in cross-cultural contexts, and the influence of cultural values on consumer psychology and emotion. Recently, she has begun exploring the relationship between supply chain agility and business performance, in addition to supply chain management in China. Professor Wong received her M.A. in psychology and her Ph.D. in business administration from the University of Michigan.

Chen ZHOU

Chen Zhou is an Associate Professor in the School of Industrial and Systems Engineering (ISyE). His research interests are in manufacturing, warehousing and logistics. He had conducted studies in logistics in China and packaging and environmental issues in global logistics operations. He has been in charge of the dual MS degree program between TLI-AP and ISyE. He has conducted Georgia Tech Summer program in Singapore and China.