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Automotive third party logistics in China

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Abstract

This Master's thesis concentrates on the investigation of the automotive third party logistics (3PL) industry in China. Therefore the overall aim of this thesis is the investigation of the Chinese 3PL environment with the focus on automotive industry. In order to clarify this aim, following four research objectives are set:

- 1) Identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services.*
- 2) Identify market specific logistics services and compare different logistics services providers in this environment.*
- 3) Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry.*
- 4) Detect industrial structures' influences on logistics services competition.*

Such a research is important as existing research focused on these objectives is extremely rare or not present. The research objectives are solved by a multi-method approach. In wide areas this thesis is a descriptive study. Thus barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services, are identified in an extensive literature review and combined with findings from interviews. These interviews are performed in a case company which is active in the Chinese automotive 3PL market. Many important characteristics and circumstances which can mainly be seen as barriers for logistics business are identified in the areas of Infrastructure and equipment, Supply and demand of logistics services, Importance of relationships, Legal issues and Staff requirements. Market specific logistics services are also identified in a literature review. In a next step these services are used to compare seven relevant 3PL providers in the industry by doing a questionnaire survey. The research shows that services mentioned in literature present in the industry. No significant differences between different competitors can be found. Thus none of these companies shows a competitive advantage due to their service portfolios.

Industrial structures for both industries automotive manufacturing and automotive 3PL are assessed by combining findings from literature and from empirical internet research. Thus industrial structures in China are ruins of earlier years in China's history. State-owned enterprises play an important role in China's automotive manufacturing industry. These companies are involved in the overwhelming share of the passenger car production. An interesting finding is that most passenger cars arise from joint ventures between these Chinese car groups and foreign car manufacturers. The Chinese car groups and the joint ventures create a network like structure in the industry. 3PL providers appear differently. Major companies identified are wholly-owned foreign companies, joint-ventures between Chinese car groups and foreign logistics providers or subsidiaries of car groups. Affiliations between logistics joint ventures and Chinese car groups indicate that competition might not be unrestrictedly present in the market.

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Abbreviations

3PL	Third party logistics
BAIC	Beijing Automotive Industry Holding Co.
BYD	Build Your Dreams Automobile Co.
DFM	Dongfeng Motor Corporation
e.g.	exempli gratia
EDI	Electronic data interchange
etc.	etcetera
FAW	First Automobile Works
GAC	Guangzhou Auto Group
JAC	Anhui Jianghuai Automobile Co.
JIS	Just in sequence
JIT	Just in time
JV	Joint venture
No	Number
OEM	Original equipment manufacturer(s)
POE	Private-owned enterprise(s)
SAIC	Shanghai Automotive Industry Corporation
SOE	State-owned enterprise(s)
VMI	Vendor managed inventory
WTO	World trade organization

1 Introduction

This thesis concentrates on the investigation of Chinese automotive third party logistics (3PL) and automotive manufacturing industries related contents. But before introducing this, some information concerning the background of this thesis are provided in the following.

1.1 Background

When talking and hearing about China, everybody's first associations include topics like "rapidly growing economy" or "manufacturing centre of the world". But from the European point of view, the country and all happenings over there are very far away and only television and other media help us to get an idea how the industry in China really looks like. For every logistician a trip to China and gathering some work experiences and logistics insights into another economy's industry is a wish or maybe even a must.

In order to get first insights into logistics industry in China, I decided to do an internship in a 3PL company in China in preparation for this Master's thesis.

But what are third party logistics?

Third party logistics is a term which is widely known, discussed and defined in literature. To start creating an idea, a couple of definitions which are recognized by me as suitable are stated in the following:

"3PL is the management, control and delivery of logistics activities on behalf of a shipper by an external provider" (Tian et al. 2010)

"...third-party logistics is analogous to outsourcing or contract logistics and is broadly defined as the use of an external company to perform all or part of another company's operations." (Bolumole 2003)

Both quotations show well what 3PL is about. But what are the reasons for using 3PL companies? By outsourcing logistics functions to a third party both cost savings and expertise can be gained. These two criteria are the usual reasons for outsourcing. Logistics buyers can concentrate on their core competencies and do not tie up their capital at logistics equipment. (Bolumole 2003, Hong et al. 2004)

Nowadays 3PL companies have the capabilities to act as experts for all kind of logistics belongings and are not simple shipping and warehousing companies anymore. They rather offer complete logistics solutions and do the coordination as well. To clear their customers of charge and to achieve additional acting fields, modern 3PL companies also offer value adding services. But most contracts are still for single and basic logistics services. (Bolumole 2003)

A 3PL company for the internship which is partly used as a case company for this thesis was found in Shanghai. Due to my background and interest in automotive industry and the case company's need for support in its department responsible for the automotive industry, a position was quickly found.

But what is the automotive industry?

Binder and Rae (2011) define the automotive industry as “all those companies and activities involved in the manufacture of motor vehicles, including most components, such as engines and bodies, but excluding tires, batteries, and fuel. The industry's principal products are passenger automobiles and light trucks, including pickups, vans, and sport utility vehicles”.

For the purpose of this thesis, the definition above is limited to passenger car manufacturers. Thus components or parts manufacturers and truck manufacturers are not focused.

Thus it was soon obvious that a research topic for this Master's thesis in the area of “Automotive third party logistics in China” will arise.

But what are automotive logistics?

The term “automotive logistics” is well explained by Liu, Y. et al. (2010) as the “entity flow of automotive producer's raw materials, components, vehicle and spare parts on steps of automotive purchase, production, sales”. The scope of activities within the field of automotive logistics includes various areas such as “inbound logistics of raw materials and components, garage logistics of production process, sales logistics of vehicle and spare parts logistics”. Liu, Y. et al. (2010) further describe automotive logistics highly complex as well as capital, technology and knowledge intensive in comparison with logistics activities in other industries.

Because China’s economy is developing rapidly and people’s income and consequently living conditions increase, also car consumption increases and more and more people are buying cars (Liu, Y. et al. 2010). In order to make the importance of research in this area even more visible, the significance of the Chinese automotive market must be visualized. Therefore the following short introduction of the market delivers key figures concerning size and growth of the market.

1.1.1 Key figures of the automotive market

The Chinese automotive market has been rapidly growing in recent years (compare Table 1 and Figure 1). As an example, the production volume has almost doubled within the recent three years – from 9.3 million to 18.3 million units per year. Last year 13.8 million passenger cars were sold (CAAM 2011 [2]) and the forecasts still predict a significant market growth of 10-15 percent (compare Table 2). This huge and rapidly growing market calls for efficient 3PL services. But automotive logistics are very complex and complicated and there is a “wide gap in automotive logistics between China and foreign countries” (Liu, Y. et al. 2010).

Table 1: Chinese car production volume development 2001-2010

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Produced cars	2.334.440	3.286.804	4.443.686	5.234.496	5.708.421	7.277.899	8.882.456	9.345.101	13.790.994	18.264.667
Produced cars in mil.	2	3	4	5	6	7	9	9	14	18
Growth absolute	----	952.364	1.156.882	790.810	473.925	1.569.478	1.604.557	462.645	4.445.893	4.473.673
Annual growth rate	----	40,80%	35,20%	17,80%	9,05%	27,49%	22,05%	5,21%	47,57%	32,44%

(OICA 2011)

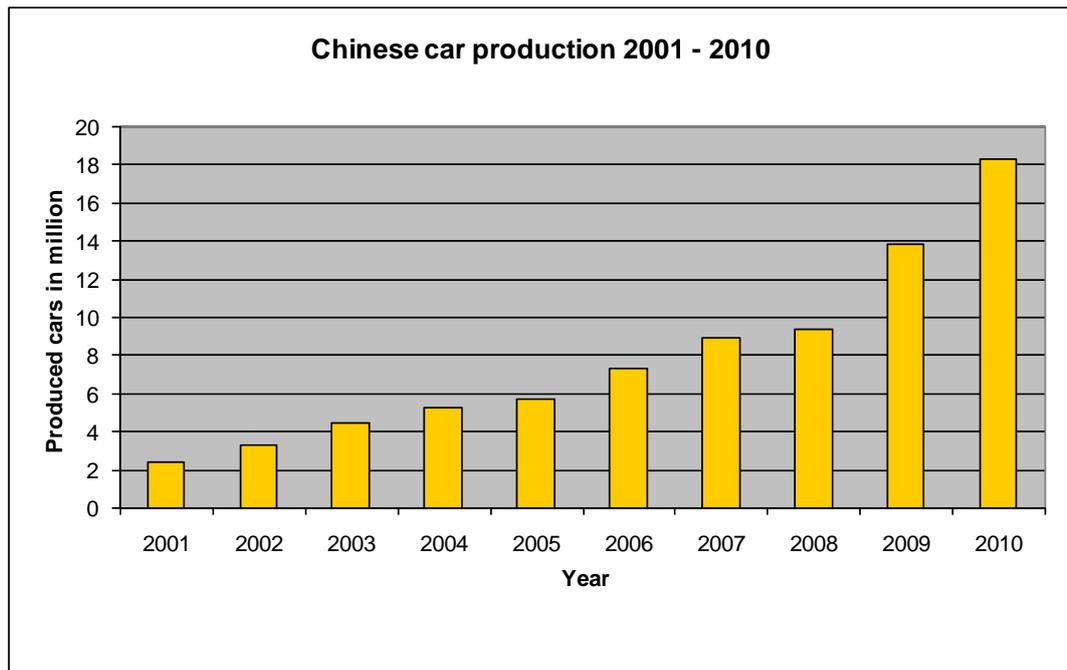


Figure 1: Chinese car production 2001-2010

Reliable forecasts of various organizations say that the market is going on to grow with a high speed between 10 and 15 percent in 2011 (compare Table 2).

Table 2: China car sales forecasts 2011

2011 sales Forecast	Organization (Date of Announcement)
+10%	Dazong, W., president of BAIC (May 13, 2011)
+10 to 15%	CAAM [3] (China Association of Automobile Manufacturers) (January 11, 2011)
+11%	J.D. Power and Associates (February 16, 2011)
+12.6%	Sinotrust (February 14, 2011)
+15%	China Automotive Industry Climate Index in Q1 of 2011 (January 25, 2011)

(References according to “Organization (Date of Announcement”)

About automotive logistics and 3PL in developed countries research is pretty advanced and offers a broad bandwidth of in-depth theory. But it was quickly realized that this is very different with Chinese 3PL and especially Chinese automotive logistics. It is extremely hard to find reliable scientific work in this field and a lot of what is existent is time-worn. Therefore the need for up to date research with a focus on automotive logistics was realized. Accordingly the overall aim of this thesis is the investigation of the Chinese 3PL environment with the focus on automotive industry.

1.2 Research focus

In order to fulfill this aim more detailed clarifications are necessary. Because the research gap in this area seems to be significant, but knowledge is needed in this area, it is decided to *identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services*. This part of the research aims at providing insight into main barriers and conditions 3PL companies in China and especially those who operate in the automotive industry are facing. Accordingly this is the first research objective of this thesis.

Because automotive logistics are if at all known by most researchers from developed countries, a clarification of automotive 3PL companies' service offerings is needed. Also interesting to know is whether there are standardized service portfolios of 3PL companies or if different companies differ from each other significantly. From this need the second research objective arose: *Identify market specific logistics services and compare different logistics services providers in this environment*.

In China's industrial environment totally different structures than in developed countries are present. Thus a market economy with all freedom for companies to act as we know from European environments does not exist. Also the possibilities for foreign companies in Chinese markets are difficult and need clarification. Hence, *assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry* is chosen as the third research objective. This research objective aims at both automotive manufacturing industry and automotive logistics industry. Later in this thesis the significance of industrial structures in the automotive manufacturing industry is made clear. In order to be able to answer the following and fourth research objective, the structures in the automotive manufacturing industry are of huge importance and even more important than those of the automotive logistics industry.

During working with these topics, in the Chinese environment and especially in the Chinese automotive 3PL, the need to clarify one more thing related to industrial structures was realized. Because these special structures were new to me and drew my interest, this fourth research objective was added: *Detect industrial structures' influences on logistics services competition*. As mentioned above, the industrial structures of automotive manufacturing industry are essential to answer this objective an in-depth analysis of these is needed.

1.3 Overall research aim and individual research objectives

Summing up what is mentioned above the overall aim of the thesis is the investigation of the Chinese 3PL environment with the focus on automotive industry.

In order to fulfill this aim and to clarify the actual directions of research in this wide subject-area, four research objectives are addressed. These research objectives are translated into one or more research questions each. All research questions are answered during the progress of this thesis and help to fulfill the research objectives. In the following the research objectives are shown again. The supporting research questions are provided as well.

- 1) Identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services.
 - a) What are the barriers and conditions of the Chinese 3PL market considering the automotive market exemplarily?
- 2) Identify market specific logistics services and compare different logistics services providers in this environment.
 - a) What are the services offered by 3PL companies in Chinese automotive environment?
 - b) How do different kinds of 3PL companies differ in their service offerings?
- 3) Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry.
 - a) What kind of industrial structures is present in China and what are their influences on automotive manufacturing and logistics ventures?
 - b) How do foreign companies act in the market?
 - c) How does it look like in reality?
- 4) Detect industrial structures' influences on logistics services competition.
 - a) How do industrial structures influence logistics service competition?

1.4 Value of this research

This thesis tries to add value to the field of research in automotive logistics in China in a few significant ways. First of all it is important to mention that research in this area is very rare and a lot of the existing research is out-dated. This is due to the fact that Chinese environment and conditions are extremely fast changing and developing. Barriers and conditions in the logistics market are discussed in literature but a complete coverage in one paper has not been found. This thesis tries to provide a broad overview and draws a connection to the automotive logistics segment in specific.

The logistics services offered by automotive 3PL providers can be found in literature. Among other things, this thesis tries to find out if these services offerings are present in the industry. Also different logistics services providers in the automotive segment in China are compared by service offerings which provides knowledge about industry's standards.

A lot is discussed in literature about Chinese industrial structures, but little about automotive industry and even fewer about automotive logistics industry's enterprises. This thesis tries to assess the structures that dominate both industries automotive manufacturing and automotive logistics.

A conclusion if existing industrial structures influence logistics service competition is drawn. Something like this is not existent in literature and thus also adds value to this field of research.

1.5 Outline of the thesis

In order to fulfill aim and objectives of the research, various actions in form of chapters are done on this thesis. Thus there are various chapters following which are described briefly in the following.

The *Literature Review* is necessary to create knowledge bases on various topics which are relevant for this thesis and also partly serves the research objectives. Existing knowledge about *Barriers and conditions of the Chinese 3PL market*, *Market specific logistics services* and *Chinese industrial structures and the impact on foreign enterprises* is provided and discussed in the literature review.

After that the *Methodology* chapter describes research methods used in this thesis. Thus the chosen *Research strategy and data collection* and the *Framework for data analysis* are described and explained in this chapter. Furthermore *Limitations and potential problems* of this research are assessed.

In the chapter of *Findings* all findings of the empirical research are presented and briefly discussed. These findings arise from various research methods. Interviews in the case company add knowledge to the main barriers and conditions in the automotive logistics environment. The internet research provides insights in the actual industrial structures and main enterprises of the automotive manufacturing industry. Additionally major automotive 3PL companies are identified and described by their types of companies. A questionnaire survey aligns findings from literature concerning logistics service offerings with industry's service portfolios and competitors in this segment are compared as well.

The *Analysis and discussion* chapter further discusses findings from both empirical research and literature. Results concerning the research objectives and research questions are provided here.

Finally the *Conclusion* chapter summarizes all relevant findings and draws important conclusions. In addition to that recommendations concerning the results of the thesis and concerning future research possibilities are given.

2 Literature Review

2.1 Introduction

The need for a literature review as a part of conducting a scientific research is obvious but needs to be explained at the same time. Dawidowicz (2010) describes the function of a literature review as “a systematic examination of knowledge available on a topic”. She further describes it as a representation of knowledge and research-based theory of what is known on a topic. This representation should summarize others’ work contents which are in relation to the own research. In other words it prevents from reinventing the wheel and rather positions the own research within the existing body of knowledge. (Murray and Hughes 2008)

Accordingly, after a methods sub-chapter for the literature review and a brief chapter outlook, definitions for main subjects of this thesis are provided. Followed by sub-chapters providing information regarding the research objectives. Therefore, the literature review is concentrating on the objectives one to three with different emphases. To put those topics in mind again, review focus is on the following research objectives respectively research questions and the related literature review headlines:

1. Identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services.

→ What are the barriers and conditions of the Chinese 3PL market considering the automotive market exemplarily?

2.4 Barriers and conditions of the Chinese 3PL market

2. Identify market specific logistics services and compare different logistics services providers in this environment.

→ What are the services offered by 3PL companies in Chinese automotive environment?

2.5 Market specific logistics services

3. Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry.

→ What kind of industrial structures is present in China and what are their influences on automotive manufacturing and logistics ventures?

→ How do foreign companies act in the market?

2.6 Chinese industrial structures and the impact on foreign enterprises

Highest emphasis is on the first topic as the related research objective is mainly answered by using the findings from literature review. Secondary emphasis is on the third topic because both literature findings and empirical research play an equal role to answer the related research question. The smallest emphasis is on the second topic because the literature only creates the foundation for the later following questionnaire survey,

2.2 *Methods for the literature review*

To understand the context and understand the environment a main target is to reach very objective results. For reaching objective results it is important to use unbiased information. This can be ensured by using peer reviewed scientific articles. (Dawidowicz 2010) Correspondingly, most information for this literature review is found in peer reviewed scientific articles but also partly from other sources such as books and online sources.

Most of the articles in use are found on the renowned online databases such as emerald, scienceDirect, IEEE Xplore, SpringerLink journals, Wiley InterScience Journals etc. Thereby the search engines are used with various combinations of keywords (e.g. “logistics” AND “China”, “automotive logistics” AND “China”, “joint venture” AND “logistics”, “joint venture” AND “China”, “3PL” AND “Chinese”, “Logistics provider” AND “automotive”, “state-owned enterprises” AND “China” and many more). But also interesting articles referenced in other articles are identified during reading. These are also searched by mainly using Google scholar. In addition, when finding a very valuable article, it is looked up which later published articles cited it. This is also mainly done by using Google scholar.

All articles holding promising titles are downloaded and sorted by categories according to the sub-chapters of this literature review. In a next step the abstracts are read and decided if the article is relevant for this study. If the abstract is promising, the article is further validated by reading the conclusion. If it still seems to be relevant, the introduction is read as well. The very best articles are studied in detail. For the search approach of the literature review see also Figure 2.

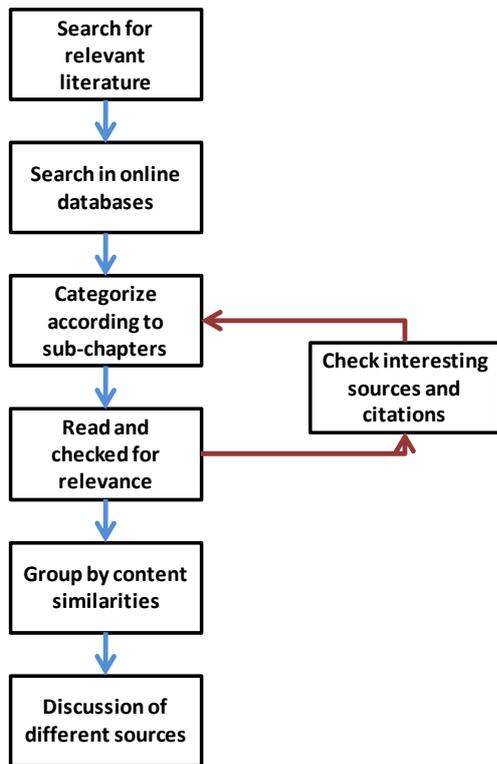


Figure 2: Methodology for literature review

2.3 Outline of literature review

This sub-chapter's purpose is to support following the structure of this literature review. Four sub-chapters are following of which three serve the research objectives and the last one is supposed to top the whole literature review off. Thus this is a brief overview on the upcoming sub-chapters:

2.4 Barriers and conditions of the Chinese 3PL market

The main focus of the literature review is on this sub-chapter. It serves the first research objective and provides information about the main topics of:

- Infrastructure and equipment
- Supply and demand of logistics services
- Importance of relationships
- Legal issues
- Staff requirements

These categories are chosen due to the information gathered during the literature review. It crystallized out that there are certain groups of information which belong topically together. Headlines for those information groups are chosen as shown above.

2.5 Market specific logistics services

This sub-chapter provides an overview about typical logistics services offered in the area of automotive logistics. That information is used for the later coming questionnaire survey in the logistics industry to compare different logistics providers in this environment.

2.6 Chinese industrial structures and the impact on foreign enterprises

This sub-chapter is the second largest part of the literature review and provides information about different kinds of companies in China. It is explained how the structures arose and how it looks like today. The information gathered serves the theoretical part of the third objective of this thesis.

2.7 Summary, conclusion and need for research

The summary, conclusion and statements about the need for research round the literature chapter off and provide a transition to the methodology part.

The following chapter starts with the literature findings concerning the first research question.

2.4 Barriers and conditions of the Chinese 3PL market

Logistics industry in China is very different from the one in developed countries (Tian et al. 2010) and its development has been relatively slow due to underdeveloped logistics structures (Speece and Kawahara 1995). Many of these factors of China's logistics environment have historical reasons. And different authors categorize China's development stages differently, either three (e.g. Zhang & Figliozzi 2010, Wu 2009) or four main stages (e.g. Hong et al. 2004). But of course the general facts are the same and reviewed briefly in the following.

Before 1978, China's planned economy kept control over main areas, thus also logistics industry. China's administration was using a three-tier distribution system in order to master all material flows (Jiang & Prater 2002; Luk 1998). These mainly transportation and warehousing operations, rarely value adding services, were generally performed by

public enterprises and private firms were mostly banned (Powers 2001, cited by Hong et al. 2004). Private firms were only allowed to offer internal transportation and some warehousing. From 1978 private – public company forms were possible, but initially played minor role and had less chances than public enterprises. But companies were allowed to choose logistics providers on their own (Luk 1998). Since 2001, when China became a member of the World Trade Organization (WTO), rules for private and especially foreign firms are getting increasingly equal. As a result of that more and more foreign logistics companies enter Chinese market. (Hong et al. 2004, 2007; Wu 2009, Zhang & Figliozzi 2010)

But logistics outsourcing in China is still under development and in an early stage. Shen (2000, cited by Hong et al. 2004) showed that more than three quarters of commercial companies did not outsource logistics functions at those times. Thus the Chinese logistics market shows great differences to those of western developed countries (Chin et al. 2007, Zhang & Figliozzi 2010). Waters (2007 cited by Zhang & Figliozzi 2010) provides the figure that total logistics costs in China are between 40 and 60 percent of total industry production while the comparable figure in the USA is 20 percent. In many Chinese minds logistics is only a term for warehousing and transportation (Chin et al. 2007). (Hong et al. 2004) Because the local logistics service providers are not able to offer high-level logistics services which are needed, Chinese government encourages foreign logistics companies to enter the market (Wu 2009; Hong et al. 2004). Some of the first authors who realize value adding services as a crucial core competence also in Chinese 3PL market are Chin et al. (2007) and Liu, Y. et al. (2010).

Chinese 3PL market is “a booming phenomenon” (Chin et al. 2007) and thus offers great potential for development and future business, because it is still in an early stage compared with 3PL in developed countries. (Chin et al. 2007) But of course there are characteristics and circumstances of the market and environment which need to be clarified. These characteristics and circumstances can be mainly seen as barriers and are grouped during the review of literature as the following:

- Infrastructure and equipment
- Supply and demand of logistics services
- Importance of relationships
- Legal issues
- Staff requirements

These five groups arose during reading literature and categorizing information. There is no certain approach which has been adopted. While doing the literature review it emerged that there are five different thematic areas in which the information can be grouped. Headlines for these groups have been chosen as mentioned above.

The first upcoming sub-chapter identifies and evaluates the infrastructure and logistics equipment circumstances, 3PL companies in China are facing.

2.4.1 Infrastructure and equipment

A relatively bad transportation infrastructure which is still under development hinders the efficient transportation across the country (Zhao and Lv 2009, Wu 2009, Pearson et al. 1998, Tian et al. 2010). Despite huge investments in transportation infrastructure recently China's transportation infrastructure cannot cope with the demand (Wu 2009) – the Chinese 5-year plan from 2001-2005 and also the 5-year plan from 2006-2010 spent each hundreds of billions of dollars in road, rail and waterway infrastructure. These circumstances lead to massive congestion problems which result in transportation delays. (Zhang & Figliozzi 2010)

Additionally the lack of overall transportation solutions leads to bad routings which reinforces this problem. Thus the Chinese transportation costs are in the world's upper range. Zhao and Lv (2009) address Chinese transportation costs with 40 to 50 percent above those in developed countries while Waters (2007, cited by Zhang & Figliozzi 2010) calculates with double the costs. This means for the automotive companies that their high logistics cost decrease their competitiveness respectively increase the price of their products. Also the lead times are much longer than they could be and quality risks during transportation are present as well. This high transportation damage risk leads to a high amount of parts which the car manufacturers have on stock and thus result in high warehousing costs. Additional cost rise from the need to reinforce the packaging of very fragile products, to prepare them for the very rough transport. (Zhao and Lv 2009; Coia 2011)

Rail transportation in China is much faster than road transportation but it is also more expensive due to the Chinese rail monopoly (Coia 2011). Zhang and Figliozzi (2010) add that China's railway network is not capable to relieve road transportation significantly and so far most of the rail capacity is in use for bulk transportation while finished goods

and industrial products are still on the road. Also Pearson et al. (1998) find that there is a lack of transportation mode choice.

Transport availability is a big issue in China (Pearson et al. 1998). Companies often have to rely on smaller logistics companies which use sub-contractors for trucking services. Their staff is poorly trained and their trucks are often in insufficient conditions. Thus for some routes within China it is hard or sometimes impossible to find fully covered trucks for example. (Coia 2011)

In addition, many logistics providers have only poor transportation tools and IT capabilities which are usually also timeworn (Lau & Zhang 2006, Zhang & Figliozzi 2010, Tian et al. 2010), e.g. no tracking and tracing systems (Jiang 2002, Pearson et al. 1998). But also power cut downs due to China's electricity shortage and missing communication infrastructure in some areas hinder the introduction of needed modern IT technology (Zhang & Figliozzi 2010, Pearson et al. 1998, Liu, Y. et al. 2010).

In general logistics providers lack state to the art technology, so they are challenged to invest in and use more advanced technology (Jiang 2002, Wang et al. 2006). The same applies for warehouse facilities which are old-designed and poorly equipped (Lau & Zhang 2006, Hong et al. 2007), e.g. bad lighting, insufficient sprinklers, poor or no temperature control and bad docking facilities. Additionally the warehouses are rarely automated due to the very low labor costs. As workforce is so cheap, it is not worth spending money on expensive state to the art equipment. But this leads to much higher damage and picking mistake rates. (Zhang & Figliozzi 2010) On top of the bad conditions of warehouses, the availability in the needed locations is also very limited (Pearson et al. 1998).

In the following sub-chapter information about logistics customers' expectations, problems and needs are assessed in order to show the gap which logistics providers need to close.

2.4.2 Supply and demand of logistics services

There are many areas in China in which industry does not see their needs for logistics services fulfilled. Literature provides a broad collection of such demands which are illustrated in the following.

Unnecessary costs are rising from the automotive companies' lack of integrated logistics services. This is due to the domestic players' logistics business which is only able to provide single simple logistics services like transportation and warehousing (Chin et al. 2007). This leads to a situation in which automotive companies have to manage directly huge numbers of logistics companies who offer these single services. The need of an integrated broader range of logistics services and network planning which makes the logistics system act more efficiently is known. (Zhao and Lv 2009) Also Liu, Y. et al. (2010) argue that Chinese automotive companies need professional logistics solutions to help them reducing their costs. The currently offered logistics services do not meet the demand of automotive companies, neither in quality nor in scope. (Liu, Y. et al. 2010; Hong et al. 2007)

A main future challenge for the whole logistics supplier industry is to develop the ability to deliver high quality services which are demanded by the customers. This applies in terms of both scope and scale. (Jiang 2002, Lau & Zhang 2006, Wang et al. 2006, Chin et al. 2007) In the past, 3PL companies usually did not meet customer expectations. Due to these bad experiences customers made, their trust is partly gone and needs to be recaptured. (Lau & Zhang 2006) But at the same time customer expectations and demands are rapidly increasing which makes the gap to close even bigger for logistics suppliers. (Wang et al. 2006)

The main bad experiences and fears of logistics consumers can be addressed as following:

- Chinese companies fear "loss of control" (Hong et al. 2007, Lau & Zhang 2006)
- 3PL providers are seen as undependable and unresponsive (Hong et al. 2004, 2007, Wu 2009, Person et al. 1998)
- Communication problems with 3PL providers (Chin et al. 2007, Lau & Zhang 2006)
- Bad lead time performance (Hong et al. 2007)
- High damage and loss rate (Jiang 2002, Wang et al. 2006)
- Variety of offered services is too limited (Hong et al. 2007, Wang et al. 2006)
- Slow response time to customer requests (Wang et al. 2006)
- Customers find 3PL providers have problems keeping confidential information secret (Wu 2009)

Wang et al. (2006) see further challenges in the increasing competition and mainly in the more and more occurring low pricing competition. Chin et al. (2007), Wong (2007) and Zhao and Lv (2009) agree that pricing is the crucial factor for the choice of 3PL provider while Tian et al. (2010) already see a growing service-based differentiation and moving away from pricing only. Together with that, 3PL companies' profit margins are very low, but costs are increasing at the same time. To be able to cope with that, companies need to broaden their scope of services and concentrate on services which add more value. Hua et al. (2009) agree by stating that competitive advantage cannot be reached by offering only such basic services, even if the performance of those is very good.

The scope of logistics services offered by logistic providers in China is described by Wu (2009) as the following: "processing, assembly and packaging, overpacking, as well as warehouse-related operations such as receiving, order picking, shipping, and goods return". Value adding services play a minor role in China so far. (Tian et al. 2010) Wu (2009) further mentions that both local and foreign car companies highly value well working inventory management and return goods management, as the automotive industry requires many components. But as mentioned above most logistics companies in China offer only simple warehousing and transportation services (Wong 2007).

For foreign automotive companies emergency transportation and tracking matters a lot. They like to be able to monitor transportation and warehousing processes to make sure that deliveries are on time. Also the foreign companies' need of customer services is much higher than it of domestic ventures. Foreign companies also put high emphasis on proper packaging and even packaging improvements and reinforcements as well as product identification systems. (Wu 2009) Other important factors for customers are pick-up and delivery reliability as well as being on-time (Chin et al. 2007).

Goh & Garg (2008) further argue that automobile manufacturers need better information sharing with the 3PL companies, because the collaboration is crucial for successful operations within the supply chain. It is for example necessary to be able to track the products during all processes.

The relevance of personal relationships for doing business in China is examined in the next sub-chapter.

2.4.3 Importance of relationships

Relationships between people, in China referred to as Guanxi, is a crucial factor in Chinese business (Lee 2011, Pearson et al. 1998, Wu 2009). This applies for logistics business as well. Zhang and Figliozzi (2010) find in their research that most managers see Guanxi to officials as a necessary resource for successful business.

The large power of authorities and especially individuals working there creates uneven preconditions for different companies, especially foreign and local companies. Thus, local companies often have long-term relationships with the officials which makes it easier to receive permissions or licenses and usually speeds up waiting and processing times. “In China, business is built largely on personal relationships” (Jiang 2002). (Jiang 2002, Wong 2007)

“The selfish departmentalism management of auto groups leads to a certain degree of fragmentation in the logistical services market.” (Zhao and Lv 2009) This means that it is very hard for 3PL providers to acquire new business at Chinese automotive companies, if they have cooperated with other 3PL companies so far. This can be explained with existing personal relationships between responsible managers of both logistics and automotive companies.

In the next sub-chapter, legal issues which might hinder logistics business in China are identified.

2.4.4 Legal issues

Mainly Chinese legislation creates obstacles for logistics business and hinders it from running as smooth as it is natural in developed countries. A few of these are identified in literature and explained in the following.

For transports crossing the borders of different provinces, different licenses are necessary. This makes it difficult especially for small size transportation companies to provide services across regional boundaries. Because of China’s province’s bureaucracy it can be a long process to get those. (Coia 2011) Public authorities also demonstrate further barriers. Hong et al. (2007) describe that each mode of transport has its own ministry.

Those ministries do not interact well which leads to very low efficiency and overlapping in the roles of different authorities. (Zhang & Figliozzi 2010)

Although China entered WTO local governments keep up local protectionism measures. These can be described as political and bureaucratic barriers which are set up in order to keep outside competitors away. The reason for that can be seen in the will to support local economy optimally. (Zhang & Figliozzi 2010, Wu 2009, Tian et al. 2010)

Uneven circumstances in the competition are also created through tax benefits which companies receive who purchase Chinese made equipment (Jiang 2002). State to the art equipment which is demanded by the customers may not be available from Chinese manufacturers or of poor quality (Pearson et al. 1998).

Another legal barrier can be seen in very short contract durations which are absolutely common in Chinese logistics outsourcing (Wu 2009). Due to these 3PL companies might have difficulties to plan and invest on the long-term. This in turn can lead to lower profit margins and the inability to acquire state to the art equipment and technology.

China's logistics industry is also facing staff related problems which are considered in the next sub-chapter.

2.4.5 Staff requirements

Many authors agree that China is facing a huge lack of qualified logistics staff. To ensure future logistics services on a high quality level, companies must invest in logistics training programs. Additionally the dialogue with universities and schools must be sought. If the logistics industry is not able to generate the needed specialists, they will have problems to cope with markets demands. (Hong et al. 2007, Lau & Zhang 2006, Wang et al. 2006)

Even the existing well trained staff lacks business experience. Know how in terms of logistics concepts and international business knowledge to match international customer needs is widely missing at logistics staff. (Wu 2009)

Wu (2009) and Liu, Y. et al. (2010) highlight and Pearson et al. (1998) and Tian et al. (2010) agree on the lack of qualified and experienced senior managers in Chinese

logistics industry. Only experienced managers can cope with “the complexity of logistics procedures and the difficulty of integrating them” (Wu 2009). Because of shortcomings in management knowledge and leadership, it’s hard for those inexperienced managers to make right decisions.

Wu (2009) sees the fact that Chinese unions are becoming stronger as a reason for bad logistics performance. He does not give any explanations but it might have to do with increasing wages and decreasing work times at the same time which lead to increasing operations’ costs. In order to be able to cope with these rising costs, companies might have to reduce service quality.

Various market specific logistics services exist. These are identified and classified in the following sub-chapter.

2.5 Market specific logistics services

To be able to compare different automotive logistics providers in China it is crucial to know which services are common in practice and necessary to offer. In the following there are typical logistics services identified and classified which are offered in automotive industry.

The automotive logistics market is as any other logistics market very flexible in terms of customer tailored solutions and different customers demand different services (Wu 2009). But of course there are, to some extent, standard services which are omnipresent. Some of these are unique to or arose from the automotive market; others are also present in other markets. Wu (2009) categorizes sector specific services in six categories named as “Warehouse Services”, “Distribution Services”, “Leasing Services”, “Technology”, “Transportation” and “Customer Services”. Except the category “Leasing Services” and “Customer Services” Wu’s categorization is congruent with services found in other literature and is used for this thesis. Solely the category “Distribution Services” is extended to “Distribution and Consolidation Services”. Because various kinds of delivery are present, the category “Delivery Services” and for services which do not fit into these categories “Other Services” are added as categories. Thus the following classification of services is chosen for this thesis:

- Warehousing Services
- Distribution and Consolidation Services
- Technology Services
- Transportation Services
- Delivery Services
- Other Services

The following services within these categories are found in literature:

Warehouse Services:

- Storage / warehousing in general (Goh & Garg 2008, Wu 2009)
- Assembly / kitting (Wu 2009)
- Picking (Wu 2009)
- Packing (Wu 2009)
- Inventory management (Wu 2009)
- Receiving (Wu 2009)
- Order processing (Wu 2009)

Distribution and Consolidation Services:

- Distribution in general (Goh & Garg 2008, Wu 2009)
- Milk-run (Goh & Garg 2008)
- Cross-docking (Goh & Garg 2008, Wu 2009)
- Direct deliveries (Wu 2009)

Technology Services:

- Barcoding and scanning (Wu 2009)
- Electronic data interchange (EDI) (Wu 2009)
- Tracking / Tracing (Wu 2009)

Transportation Services:

- Shipping in general (Goh & Garg 2008, Wu 2009)
- Road transportation (Wu 2009)
- Rail Transportation (Wu 2009)
- Water transportation (Wu 2009)
- Intermodal transportation (Wu 2009)

Delivery Services:

- Just in time (JIT) delivery (Goh & Garg 2008)
- Just in sequence (JIS) delivery (Goh & Garg 2008)
- Vendor managed inventory (VMI) (Goh & Garg 2008, Wu 2009)

Other Services:

- Import / export services of parts and finished vehicles (Goh & Garg 2008)
- Sub-assembly services (Lin et al. 2009)
- Packaging design (Wu 2009)

Some of the services mentioned above are commonly known others may need clarification. Thus short explanations for the services can be found in the *Appendix 1: Explanation of services*.

2.6 Chinese industrial structures and the impact on foreign enterprises

The purpose of this sub-chapter is to provide knowledge, why industrial structures are as they are today. This especially includes how these structures arose. Furthermore the impact on today's business and foreign ventures is examined and explained. In order to do that, first the historical development is described and later on today's possible venture structures for both automotive industry and automotive logistics industry are examined.

2.6.1 Historical development

China's economy has basically developed in three stages. Before 1978 the economy was centrally planned, between 1978 and 2001 there was a lot of liberalization going on and the system was continuously opening up and after 2001 when China entered the WTO. Since the latter happening, China's economy is continuously and rapidly growing and opens up further. In other words, China has been developed from a centrally planned to a market economy. (Zhang & Figliozzi 2010; Liu, X. et al. 2010) These stages are described in more detail in the following.

China was founded in 1949 and from then to 1979, China had a centrally planned economic system (Liu, X. et al. 2010). All industrial ventures in China were state-owned enterprises (SOE) (Xiaohua 2010) and were financed through the governmental bank.

These SOE were a pillar in Chinese economy and social system at the same time. Thus people had guaranteed jobs for their whole life, but earned very low wages. The companies also provided social services like workers' pensions, health care and covered education expenses. The produced goods were usually in short supply, without competition and with dictated prices by government. In addition to that, staff and managers were no attractions offered to concern about improvements. Also the SOE themselves had no profit objectives. Consequently SOE were extremely inefficient and usually making losses (Hassard et al. 2010). (Bai et al. 2006)

China's reform of the economic system also referred to as "open door" economic policies began in 1979 and has gone through different stages with different political instruments and purposes. These different steps are not described here in detail. Only general knowledge which is interesting for this thesis is mentioned.

During this process, authorities' responsibilities were decentralized from central to regional (Hassard et al. 2010). SOE got a higher degree of self-directing authority. Additionally, the barriers for founding non-SOE were eased stepwisely in order to avoid negative results of "big bang" or "shock therapy" policies as it has happened during the transformation processes of other economies before (Hassard et al. 2010). The result was that business competition for the SOE arose. These non-SOE had various competitive advantages e.g. less staff responsibilities, no pensions for former employees to pay and only as much staff as they needed. In comparison, the SOE had to pay pensions for former workers and had about 30 percent to much staff, because they were not allowed to dismiss them. Not only these burdens are responsible for high debts of the SOE (Woetzel 2008). All these facts provide a good idea about the competitiveness of such enterprises in a market economy. But as mentioned above, the SOE had no need to be profitable (Hassard et al. 2010). (Bai et al. 2006)

The open door policies further supported the internationalization of Chinese companies and various external funding sources became available. Everything together stimulated the economy to grow rapidly. However, due to the SOE' huge size, described by Woetzel (2008) as "muscle-bound goons", and the huge number of enterprises, the SOE used to deliver the major stake of the Chinese industrial output. This positioned them initially in a central role of the Chinese economic system. Accordingly, the SOE were a crucial part of the whole transformation process. (Hassard et al. 2010)

A big problem is present, many SOE are still not able to make profits, the management lacks business skills and necessary restructurings are difficult to perform in these giant companies. This makes it difficult or even impossible for such SOE to catch up with market requirements. (Hassard et al. 2010) But various authors (e.g. Woetzel 2006, Hassard et al. 2010) agree that SOE can not all be seen as structural same. Each one developed in a different direction with different paces and different motivations. Woetzel (2006) suggest judging both SOE and non-SOE by openness which describes the ability and willingness to change, the openness to innovation as well as their transparency and the broadening of their investor base. (Woetzel 2008) Xiaohua (2010) emphasizes that as long as a company is state-owned, it has “to meet criteria beyond economic rationality to maintain legitimacy”.

The Chinese government puts still high emphasis on the restructuring process of these former giant SOE. In the core, the approach is to split these groups up to smaller entities and privatize the strategically minor important units. Together with that, they try to shift responsibility away from the central government and make the SOE work increasingly independent. At the same time the SOE are getting more responsibility for the companies' failures and successes. (Hassard et al. 2010)

2.6.2 Possible industrial venture structures for foreign automotive companies

Elango and Sambharya (2004) point out three different modes companies can choose to enter overseas markets. The first two are the creation of wholly owned subsidiaries which can be done in two ways. First option is a Greenfield venture and the other option is the acquisition of an existing enterprise. The third possibility to enter a foreign market is the establishment of a joint venture together with a local company. Furthermore, Elango and Sambharya (2004) describe five different industrial characteristics and the usually related choice of entry into foreign markets. Those five industrial characteristics are addressed as concentration, import intensity, plant scale economies, growing markets and demand variability. (Elango and Sambharya 2004) Both automotive and logistics industry can be best fittingly describes by rapidly growing. Following Elango and Sambharya (2004) companies prefer to Greenfield operations over acquisitions or joint ventures in such situations.

Pearson et al. (1998) have a closer look at Chinese circumstances and find that foreign companies are seeking alliances and partnerships, mainly joint ventures, to “bypass

barriers caused by government policies, reduce risks, and gain access to foreign markets". Especially in China they argue that the membership in a joint venture can lead to governmental orders. As those can be of significant volume, it motivates companies to prefer joint ventures over other entry options. This can overrule the decision making reasons described by Elango and Sambharya (2004). In addition to that, such joint ventures might be the only option to get market access to China (Webster 1989). As Webster's article is from 1989, this might not apply in general anymore, but for some industry such as automobile it still does.

But not only foreign enterprises influence the type of entry mode. As a key point of the Chinese government's strategy can be seen to build up a few enterprises in key industries which will be able to compete globally. To reach this target, restructuring the old structures is only one aspect (described in the previous sub-chapter). In addition, foreign know how and technology need to be gained. Two very common practices are mergers and acquisitions of foreign companies but also the creation of joint ventures with foreign companies within China. (Hassard et al. 2010) The mergers and acquisitions are not relevant in the context of this thesis, but the joint ventures are.

Chinese government declared the automobile industry as a pillar industry (Goh & Garg 2008) and thus it possesses special protective regulations. Even after joining the WTO automobile industry holds precise regulations for foreign investments. Thus for manufacturing enterprises in the car industry only establishing joint ventures was possible to enter the market. Due to foreign equity limits set up by Chinese law, the only way for foreign companies to set up car plants is by joining a joint venture with a Chinese partner. These partners are usually SOE and the maximal ownership of the foreign partner is limited to 50 percent. (Wang 2002)

2.6.3 Different types of logistics providers

This subchapter's aim is to detect and describe generally common types of logistics companies in Chinese automotive environment.

Lemoine & Dagnaes (2003) describe basically three different types of logistics services providers which are common especially due to internationalization and globalization of companies. The first type is the wholly owned firm arising from self-founding or acquisition of existing logistics companies (Selviaridis & Spring 2007). A second option is a joint venture or other type of alliance with companies in the target market or industry. These joint ventures are possible in two directions which are distinguished by Selviaridis

& Spring (2007) in vertical and horizontal. Thereby vertical alliances are cooperations between a shipper and a logistics provider while horizontal alliances are between different logistics companies. The major aim of horizontal alliances is getting access to another geographical market. Vertical alliances rather aim at accessing certain market segments. In the third scenario, a company in any kind of industry founds a subsidiary or department which has the purpose of acting for the parent company as a logistics provider. (Lemoine & Dagnaes 2003)

Wong (2007) distinguishes differently. She separates in four categories which are “state-owned public companies, privately-owned domestic companies, international/ foreign wholly-owned or joint venture companies, and in-house logistics subsidiaries or joint ventures.” (Wong 2007)

Bolumole (2003) distinguishes even between six different roles of logistics service providers and some of these are possible to combine with Lemoine & Dagnaes (2003) categorization. Thus Bolumole sees especially in the option of a joint venture between a producing firm and a logistics company huge potential but he also argues that this kind of logistics cooperation goes beyond outsourcing and cannot be compared with normal third-party logistics. From his understanding, these joint ventures have as similarity with normal outsourcing the purpose of cost reduction but the major difference is that such companies are not willing to lose logistics competence and rather want to gain access to other companies’ resources. He also describes the option of having a department which functions as a logistics provider. (Bolumole 2003)

After China’s entrance to the WTO, many horizontal alliances as well as mergers and acquisitions took place. Especially small and medium sized Chinese logistics companies were bought or joined logistics networks to stay competitive and extend their service portfolio and geographical coverage. (Liu, X. et al. 2010)

Pearson et al. (1998) mention that alliances and partnerships for logistics companies are not common. But they are a good tool for “gaining presence in foreign markets” and overcoming existing logistics barriers in foreign environments as local partners are aware of special circumstances and regulations. But they also point out the difficulty of establishing well working partnerships. A main obstacle is the choice of partner. If choosing a wrong partner, whole operations can fail.

2.7 Summary, conclusion and need for research

The literature review shows much relevant information concerning the first three research objectives.

Concerning the first research question “*What are the barriers and conditions of the Chinese 3PL market considering the automotive market exemplarily*” it can be said that many of today’s characteristics and circumstances in the logistics and automotive logistics environment have historical reason. There are still many legacies from the earlier Chinese planned economy. The general understanding of logistics services is limited to transportation and warehousing functions in China. Not only this indicates that the Chinese 3PL market is still in an early stage. But it is a fast growing market. In order to cope with automotive 3PL business barriers and circumstances in future there is a need for a study that evaluates current market conditions. Therefore the following categories are examined in the literature review:

- Infrastructure and equipment
- Supply and demand of logistics services
- Importance of relationships
- Legal issues
- Staff requirements

Literature broadly presents information that transportation infrastructure and transportation equipment are generally in insufficient conditions which has a variety of impacts. The most obvious impacts are long lead times and high transportation costs as well as high transportation damage rates and low transportation equipment availability. Similar conditions apply for IT and communication infrastructure which is insufficiently expanded, too. Additionally state to the art logistics equipment and technology is rare. Usually timeworn or bad quality equipment is in use, because work force is still cheap and especially cheaper than high quality equipment. This circumstance also decreases service quality significantly.

In the recent past customer demands have rarely been met but the need for various cost-saving 3PL services is existent. Customers especially seek single-source logistics solutions, because they needed to conduct large numbers of single-service vendors so far. This situation does not match the idea of 3PL, because the customers are not able to concentrate on their core businesses. The so far offered services are mainly basic logistics

services and the calls for high quality and a broader value adding services portfolio are becoming louder. Due to the bad experiences with 3PL providers in the past, trust of many customers is gone which needs to be gained back.

Because at the moment a low price competition within the industry is at the fore, it is difficult for 3PL providers to keep profit margins reasonable and invest in good equipment at the same time.

“Guanxi” which is the Chinese term for personal relationships plays a significant role in Chinese business. This applies for many situations. For example when dealing with authorities Guanxi can speed up processing time or decide about success and failure. The same applies for relationships with business partners. Guanxi can make companies win or lose contracts even if their offers are better. This is one of the most important factors in Chinese business.

Legal circumstances created by government and authorities create barriers for various areas in logistics business. These barriers are often of protectionist nature to keep outside competitors away. Thus for example are transportation licenses not granted for the entire country rather single licenses for different regions or provinces are needed. This can influence 3PL providers’ ability to provide single-source solutions at a supra-regional level. Another legal circumstance which has significant influence on 3PL providers’ ability to invest on the long-term is the situation of short contract durations which are common in China.

In addition to everything mentioned above, a significant lack of qualified staff in all hierarchical levels is present in Chinese 3PL industry. On the one hand this makes it difficult to offer high quality services and keep a certain level of quality. On the other hand it increases operation’s costs as staff needs to be trained permanently.

For the second research objective the research question a) *“What are the services offered by 3PL companies in Chinese automotive environment?”* is answered in this literature review. A variety of market specific services is found and classified. The need for empirical research is arising to check whether these services found in literature are common in practice or not. Also if they are common for all 3PL providers or just some of them needs clarification. Therefore this theoretical information creates the foundation for the later following questionnaire survey which also answers the second part of the second research objective b) *“How do different kinds of 3PL companies differ in their service offerings?”*

In order to solve the third research objective three research questions are set. The first question a) *“What kind of industrial structures is present in China and what are their influences on automotive manufacturing and logistics ventures?”* is answered in the literature review. Due to China’s historical development there is a prevalence of SOE identified. POE with both foreign and Chinese ownership are possible but the major industrial output is produced by SOE. Also joint ventures are possible in the market. In the special case of the automotive industry there are only SOE and Chinese POE possible. If foreign companies want to enter the market the only option is to create a joint venture with a Chinese company. Thereby the foreign partner is not allowed to own more than 50 percent of the joint venture. This answers the second research question of the second research objective b) *“How do foreign companies act in the market?”* concerning the automotive manufacturing ventures.

For the case of the automotive logistics industry generally the following kinds of enterprises are possible; wholly owned Chinese or foreign company, joint venture in horizontal or vertical way and subsidiaries of manufacturing companies.

In order to verify these findings and to create an actual picture, empirical research is necessary. Especially in respect of automotive industry and automotive logistics industry no research has been found and thus this gap needs to be closed. Therefore the third research question of this second objective c) *“How does it look like in reality?”* will be served in the empirical research in the findings chapter.

Additionally the research question to the fourth research objective *“How do industrial structures influence logistics service competition?”* needs empirical research. Because this problem has not been solved at all in literature so far, this thesis tries to find answers.

As described above, there are still some questions open or partly open. In order to find answers empirical research is done in the following. Therefore the upcoming chapter explains the methodology that applies for this research.

3 Methodology

3.1 Introduction

For introducing this thesis' methodology, a look at the research objectives respectively research questions is necessary and done in the following:

- 1) Identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services.
 - a) What are the barriers and conditions of the Chinese 3PL market considering the automotive market exemplarily?

This research question is answered to a major part in the literature review. The methods for the literature review are explained in detail in the sub-chapter 2.2 *Methods for the literature review*.

In order to identify gaps in literature and to identify very significant barriers and conditions also empirical research is done to solve this question. The empirical research in this case is done in the form of interviews in the case company.

- 2) Identify market specific logistics services and compare different logistics services providers in this environment.
 - a) What are the services offered by 3PL companies in Chinese automotive environment?

Very similar to the methods of the first research question, also this question's processing includes both literature-based as well as empirical research. A broad variety of industry typical logistics services is discussed in the literature review. Empirical research in this area needs to be done to serve the second question to this objective:

- b) How do different kinds of 3PL companies differ in their service offerings?

3) Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry.

a) What kind of industrial structures is present in China and what are their influences on automotive manufacturing and logistics ventures?

The literature review is used to provide a broad knowledge base of the existing industrial structures in China and also about the theoretical possibilities existing for companies to exist in both automotive and logistics industries.

b) How do foreign companies act in the market?

The options for foreign companies in both logistics and automotive industries are drawn in the literature review. A comparison with the reality is done by using findings from the empirical research.

c) How does it look like in reality?

The empirical research is used to create an actual picture of the automotive and logistics industries in order to illustrate the fourth research objective's findings.

4) Detect industrial structures' influences on logistics services competition.

a) How do industrial structures influence logistics service competition?

To answer this question it is tried to draw conclusions from the findings of empirical research.

Summing this up, the literature review which's methods are described in the sub-chapter *2.2 Methods for the literature review* is performed to serve at least partly the research objectives 1 – 3. The empirical research contributes to all research objectives. In the following the research strategies are in the center of attention.

3.2 Research strategy and data collection

The question for the research strategy adopted in this thesis is special and needs explanation. Therefore a look at what is done so far is helpful to reduce the remaining

scope of the thesis which is still open. This is done stepwise in the following whereby the four research objectives represent these steps. In general it is important to mention that wide areas of this thesis are of descriptive nature.

The literature review covered wide areas of the first research objective. Thus knowledge is provided about the barriers and conditions in the automotive logistics market. This topic could be complete like this, but because the chance of performing interviews in a case company exists it is decided that the literature review is combined with a qualitative research in nature of a “case study” research strategy (Biggam 2008). Because it is very difficult to evaluate the significance of different barriers in the automotive logistics environment just by analyzing literature, it is decided to perform interviews in the case company. The aim of these interviews is to identify most significant barriers in this environment and maybe also identify gaps in literature. Due to this aim, the case study approach is very suitable as Yin (2009) states “The more that your questions seek to explain some present circumstance [...], the more that the case study method will be relevant”. Consequently the technique of data collection for this part is interviews with open-ended questions. These interview questions can be found in Appendix 2: Interview questions. Because the case company is known and the logistics managers are known, the sampling technique for this interview is “convenience sampling” (Biggam 2008). Interviewees in the case company are from various positions, e.g. key account managers, operations managers, legal department and business development. The interviews took place in late July 2011.

As the next step, the literature review also covered a big part of the second research objective. A variety of market specific logistics services is provided and classified. In order to find out if different 3PL providers offer different services, empirical research is needed. Therefore a “survey” in form of questionnaires is chosen as the research strategy which is of quantitative nature (Biggam 2008). Rubin and Babbie (2010) explain that “In a typical survey, the researcher selects a sample of respondents and administers a questionnaire to them.” This is done here as well. The questionnaire as the data collection technique includes both open and closed-ended questions. Thereby all questions concerning offered services are closed-ended in order to check whether a company offers the listed service or not. The open-ended question serves research objective four and is described later. This questionnaire can be found in Appendix 3: Questionnaire. Because there can only be chosen from a very limited number of companies to perform the survey, the most suitable sampling technique in this case is the “quota sampling” (Biggam 2008). In numbers, ten relevant companies in the market could be identified of which six were

willing to take part in the questionnaire survey. The managers asked all from key account managing and business development positions. The questionnaire survey was done in August 2011.

Also for the third step the literature review provides broad information for the third research objective. Many details about China's industrial structures for both automotive and automotive logistics industry are discussed. Also the possibilities for foreign companies to act in these markets are drawn. To find out if companies follow the theoretical way and to be able to illustrate the answer to research objective 4, empirical research is needed. This quantitative research is performed by using the internet as a research tool (Illingworth 2001) and collecting secondary data.

As a last step, the fourth research objective needs to be served by drawing conclusions from the empirical research. Therefore the survey for the second research objective is used. For this part there is only one open-ended question. This question's purpose is to find conclusions about the companies' kinds and their influence on competition. This small part of the research is also quantitative. According to what is mentioned above concerning the survey, also this part is using "quota sampling" as the sampling technique.

As seen above, there cannot be one research strategy addressed for the whole thesis. Including the literature review part, there are four different research strategies applied for this research. This is necessary to fulfill the research objectives in a satisfying way. This way is not new and can be seen as a *mixed methods research* (Johnson & Onwuegbuzie 2004). According to Johnson & Onwuegbuzie (2004) "Mixed methods research is formally defined here as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study."

3.3 Framework for data analysis

As seen in the previous sub-chapter different research strategies apply for the different research objectives. Therefore also for the framework of data analysis different approaches are necessary.

Reminding of the first step of the research strategy respectively first research objective, the prevalent data source is the literature review. This information might be expanded by

findings from the interviews in the case company. The main purpose of the interviews is to identify most significant circumstances in the market. Thus the findings from literature are compared with the findings from interviews. This process is displayed in Figure 3.

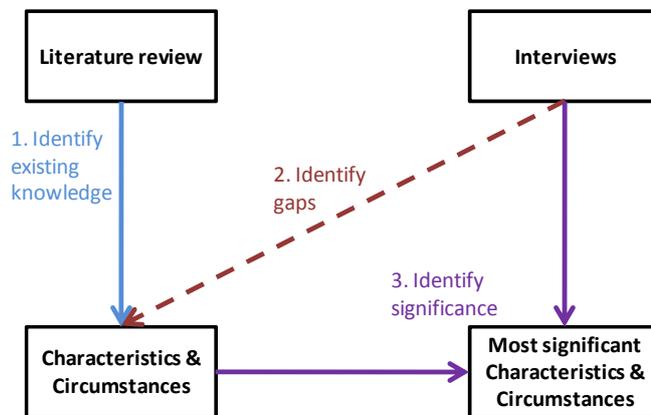


Figure 3: Framework for data analysis research objective 1

Also the second research objective is served by creating a knowledge base from literature review. This knowledge base is used to create a questionnaire with closed ended questions in order to check whether the companies offer those services or not. From the answers it is possible to see two things. First, whether the logistics services found in literature are common in practice or not. Second, differences in competitors' service offerings can be identified. Maybe a classification of different kind of logistics companies (compare sub-chapter 2.6.3) is also possible by their service offerings. For this approach also see Figure 4.

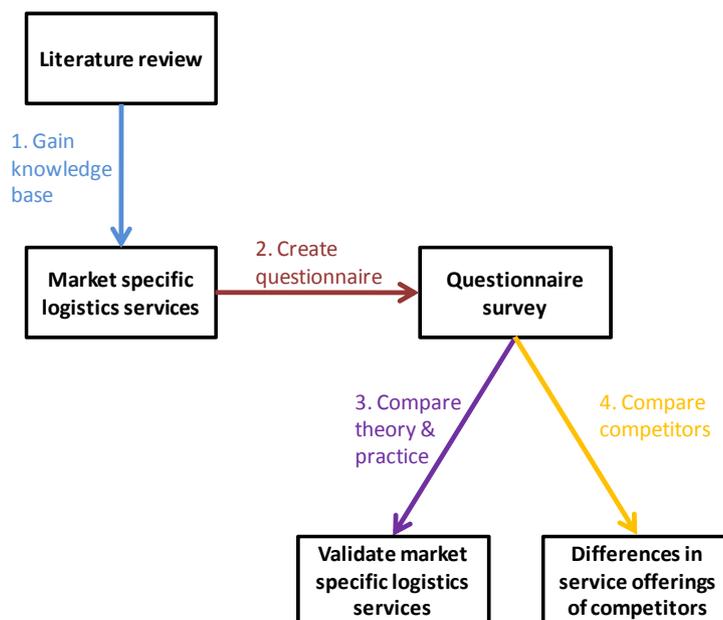


Figure 4: Framework for data analysis research objective 2

The framework for data analysis for research objective three is a bit more complex to describe. This is due to the circumstance that two different industries are in the focus of interest; automotive industry and automotive logistics industry. But there are many similarities in the approaches as well. The literature review provides knowledge about theoretical possibilities for companies to exist in these two industries. This is mainly about ownership possibilities for the companies. Thereby a special focus is on the possibilities for foreign enterprises. The following process is different for both industries and thus described separately.

Automotive industry: By performing an internet research for the automotive industry, major manufacturers in the industry are identified. Afterwards their type of ownership is found out. Special interest is on the joint ventures and their ownership partners. The actual picture and the theoretical findings are compared in the end to see how the automotive industry's structures look like and how foreign companies are present in the market (compare Figure 5).

Automotive logistics industry: Intelligence of the case company is used to identify the most significant players in the market. By performing an internet research these companies' kinds of ownership are identified and show the actual picture of the industry. This picture is compared with the findings from theory. Thus it is possible to see which theoretical possibilities are applied in practice and which role foreign companies play in the market (compare Figure 5).

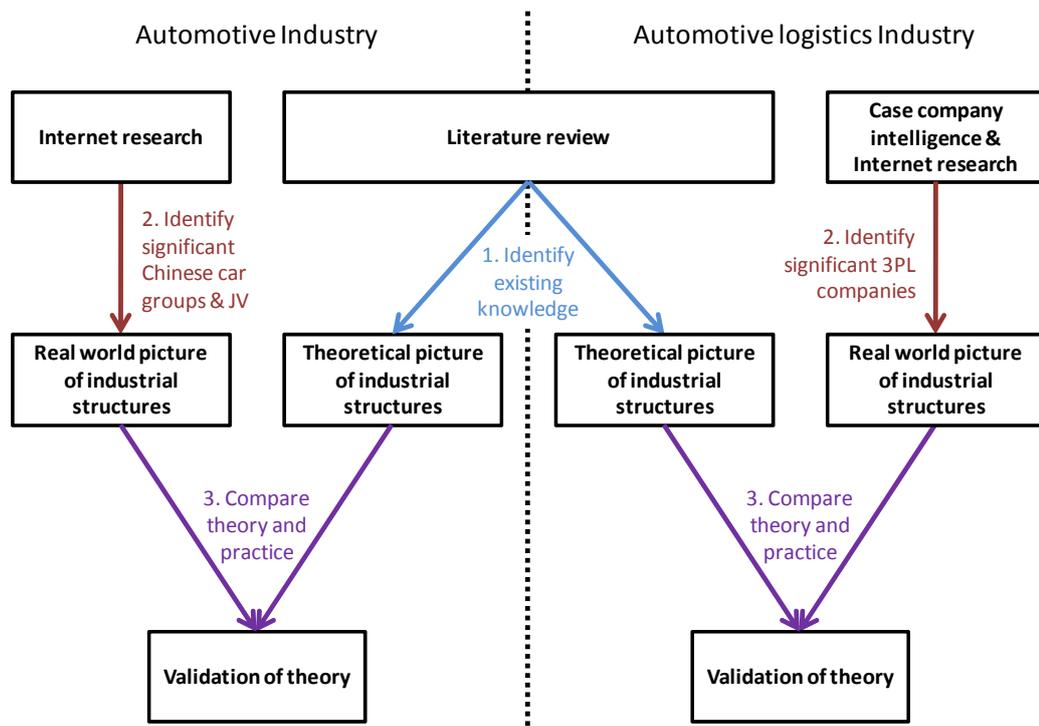


Figure 5: Framework for data analysis research objective 3

The fourth research objective is making use of the various findings. Thus there is one open-ended question included in the questionnaire. This question asks for the logistics companies' customers. The knowledge gained from this question's answers is compared with the actual pictures of both automotive and automotive logistics industry. By combining these different findings, it is maybe possible to see if there might be an influence on competition created by the industrial structures (compare Figure 6).

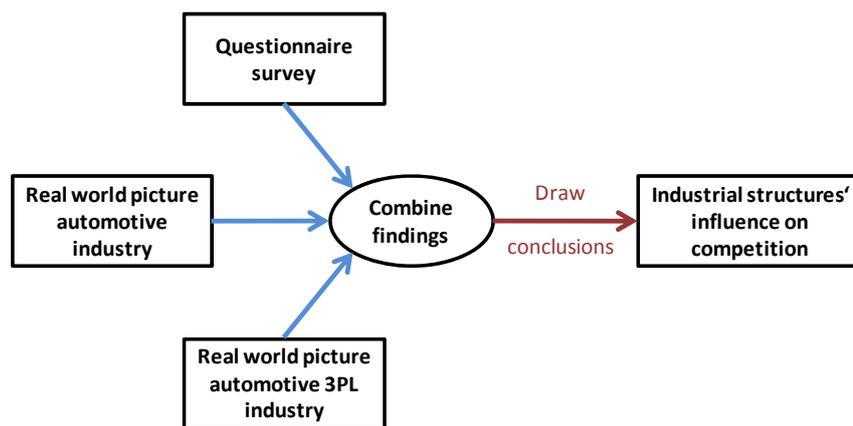


Figure 6: Framework for data analysis research objective 4

3.4 Limitations and potential problems

Various limitations and potential problems are identified for this research. The case study and interview approach together with the convenient sampling technique which serves the first research objective. Because the interviews were only performed in one company the results may be one-sided and thus a bit biased. This problem is not seen as very significant, because the interview results are only used to determine the barriers' significances. Thus the results from the interviews are judged as being reliable. The chosen approach of interviews is appropriate for this purpose, because industry insiders are experts in assessing their industry's main barriers and conditions.

For the questionnaire survey related to research objective two, another option might open-ended questions be. Because the interviews in the case company showed that the managers found it difficult to answer open-ended questions, it was decided to perform the questionnaire in a closed-ended way. The reasons for the problems with open-ended questions can only be estimated, but the most significant reason can be seen in the use of English language for this research in the Chinese environment. Even in the case company interviews, some managers preferred to have a translating colleague in the interview to support them. As the number of companies to ask for the questionnaire is very limited, the risk of people not answering because of difficulties with open-ended questions needed to be reduced. Because of that all but one question are closed-ended. All respondents are able to understand the questions and the chance of mistakes in choosing between either *Yes* or *No* can be seen as minimal. So the results are reliable.

Also the circumstance of using the quota sampling technique for identifying most significant logistics services providers in the market has a high risk of being biased, because the indications for the choice came from the case company. By doing the internet research it is tried to validate the significance of the chosen companies but this is only possible in a limited scope. Survey as the approach is valid as it is a common way to reach a certain population of respondents within an industry.

Concerning the third research objective and the use of the internet as a research tool it might be a problem that this approach is scientifically doubtful. Nevertheless, because it is difficult to find any scientific information and especially up to date information is extremely rare, this approach is chosen. It might be the only way to find information which covers the scope of this research in a satisfying way, so due to these circumstances

this approach is appropriate. From my point of view all information used are trustworthy and are chosen in a careful manner.

A significant limitation for the content of the findings part and the initially targeted results is present. Because all logistics companies used for the questionnaire do not want to be namely mentioned, it is impossible to show the connections between logistics services providers and automotive manufacturers in such a clear and obvious way as it could be possible. This means that real affiliations between logistics companies and automotive groups cannot be shown. Thus only general conclusions can be drawn concerning the fourth research objective.

Also in relation to the logistics companies used for the questionnaire survey, there is another limitation. The kinds of ownerships of these companies are found out by performing internet research. This part of the research is not included in the findings chapter because the companies do not agree to be namely mentioned. Thus their kind of ownership is only mentioned and needs to be accepted for the purpose of this thesis.

In order to keep the scope of the findings part in a reasonable scope, only the top ten passenger car manufacturers; only passenger cars because this was the initial intention of this thesis' target market, only the top ten manufacturers are chosen in order to be able to concentrate on the significant manufacturers. Due to this, the findings can be biased in respect of smaller manufacturers respectively do not apply for these companies. The same limitations apply for non-passenger car manufacturers such as truck or bus manufacturers and car parts manufacturers.

As a limitation for the whole study and especially for the literature review must be addressed that business in China always has a high degree of legislative implications which apply generally. It is tried to stay away from those influences and rather stick to the legislative circumstances which are really related to this research's objectives.

4 Findings

4.1 Introduction and background

This chapter's aim is to provide data gathered from empirical research as described in the previous methodology chapter. Thus for supporting the findings of the first research objective, *Identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services*, interviews in the case company are performed. The most significant results are provided and shortly aligned with the literature review in this chapter. The asked questions can be found in Appendix 2: Interview questions.

Regarding research objective three, *Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry*, this chapter provides information about the major companies in both automotive manufacturing and automotive logistics industries. Therefore the major manufacturing companies are identified. These companies' kinds are found out as well as foreign companies' activities in the market. An actual picture shows how the industrial structures look like in the car manufacturing industry. Also the major logistics companies' and their kinds are identified. This part of the research was done by performing an internet research.

After that the results from the questionnaire survey in the automotive logistics industry are provided for serving the second research objective, *Identify market specific logistics services and compare different logistics services providers in this environment*. In this survey, literature findings are aligned with industry's service offerings and competitors are compared concerning their offered services.

4.1.1 Description of case company

As the term case company is mentioned in this thesis and interviews are performed in this company, a short description of the company is necessary. Beforehand it is important to say that the case company is namely not mentioned due to non-disclosure agreements. In this thesis it is always referred to as "case company".

The case company is a wholly owned foreign enterprise in China. It is a subsidiary of a multi-national 3PL provider with international presence and networks. Globally the case

company is one of the leading 3PL providers. In China various industries and businesses are targeted. One of the case company's divisions is responsible for the automotive customers. This division is relevant for this research.

The automotive division of the case company is in charge for customers from both car manufacturing industry and car parts supplier industry. Thus logistics services in the ranges of inbound, in-plant, outbound and aftermarket are performed.

The previously mentioned internship took place in the automotive division of the case company and the interviews were performed there as well.

4.1.2 Chapter outline

The following subchapter *Perceptions from interviews* – provides all important findings from the interviews and aligns those with the findings from literature.

After that in the sub-chapter *Automotive market* first the leading companies are identified; leading Chinese automotive groups and leading manufacturing joint ventures. For the Chinese automotive groups the types are identified as well as their existing joint venture activities. These steps are necessary in order to answer research objectives three and four. In the end a picture visualizes how Chinese car groups and joint ventures are connected in the reality.

In the end of this chapter in the sub-chapter *Automotive third party logistics* the ten most significant automotive 3PL providers and their types of company are identified. The questionnaire survey in which six of these ten companies took part is presented in order to align literature findings with real service offerings and to compare competitors in this area.

In the end, a brief chapter summary provides a retrospective chapter overview.

4.2 *Perceptions from interviews – main barriers and conditions of the 3PL market*

In addition to the literature review, interviews in the case company are performed in order to identify the most important barriers for 3PL providers and maybe identify gaps in literature. These interviews also serve research objective 1 - “Identify barriers and conditions of the 3PL market”. Many of the mentioned barriers are similar to those in the

literature review, but of course not all of them were mentioned by the managers. Because managers are only asked for the most significant barriers, just a few are mentioned here. In order to align with literature review, the same headlines are used here.

Infrastructure and equipments

One interviewee responded that a major issue can be seen in the availability of warehouses with necessary high standards which corresponds with Pearson et al. (1998). Thus warehouses are categorized with different fire rate classes (A, B, C and D). Often it is hard to find available warehouses which offer the needed fire rate class. Also and not mentioned in literature are the presence obstacles with property certificates. Difficult property regulations do not allow to build up warehouses anywhere and also not to let the facilities to anybody respectively not to lease from anybody.

Supply and demand of logistics services

Low pricing competition is a big issue. Four interviewees addressed it as a major obstacle as there is not much room left to invest and it is not possible to offer a service quality on a high level as they could. This coincides with the findings from literature (compare Wang et al. 2006, Chin et al. 2007, Wong 2007 and Zhao and Lv 2009).

High damage rates lead to penalties and an increase in the work load. Those damages can happen everywhere and the origins are difficult to detect. Also 3PL companies' reputation at the customers suffers due to this circumstance. This is also mentioned in literature e.g. by Jiang (2002) and Wang et al. (2006).

Importance of relationships

One of the most significant factors of logistics business in China is Guanxi which all managers replied. This matches with literature and the importance of relationships is explained in more detail there (compare Lee 2011, Pearson et al. 1998, Wu 2009).

Legal issues

Short-term contracts as mentioned by Wu (2009) is also seen by the managers as a major obstacle. More and more outsourcing contracts are of short duration. This leads to the inability to invest in the long-term and makes 3PL companies dependent on short-term

leasing contracts for facilities and equipment. Thus operations' costs increase and which in turn leads to lower profit margins again.

Staff requirements

In addition to the staff requirements mentioned in the literature review, three managers' interviews revealed that a very serious problem logistics companies are facing is the high fluctuation of staff. This leads to a permanent loss of knowhow and also to a permanent need of staff training procedures. As a result operation costs increase and this situation makes it hard to keep a high level of service quality.

One manager observed that often people are not willing to change processes, even if the change can lead to improvements. A reason for that can be seen in a lack of knowhow and the fear of losing the own job, if a process is improved. Even if this problem is present everywhere it is worth mentioning.

4.3 Automotive market - Chinese industrial structures and their impact on foreign enterprises

4.3.1 Leading companies

China has many car manufacturers, but most of them are of minor size, e.g. ChinaCarForums (2011) lists 45 Chinese car manufacturers. In order to just taking the important firms into account for this thesis, the top ten are chosen to have a closer look at. The China Association of Automobile Manufacturers provides monthly updates about sales figures of both Chinese car groups (Table 3) and all single car manufacturers (Table 4). The difference in those figures is that each car group owns various brands and is also shareholder of different joint ventures with foreign companies. Additionally these figures include commercial vehicles and buses besides passenger cars. But this thesis focuses on passenger cars only, as mentioned in the limitations. In order to illustrate the difference Table 3 and Figure 7 show the top ten Chinese car groups and their market shares. These top ten car groups account for 86% of total vehicle sales in China (CAAM 2011 [1]).

Table 3: Top ten Chinese car groups by sales volume 2010

Rank	Group	sales 2010	Overall market share
1	SAIC	3.558.400	19,70%
2	DFM	2.724.800	15,09%
3	FAW	2.558.200	14,16%
4	Changan	2.378.800	13,17%
5	BAIC	1.489.900	8,25%
6	GAIC	724.200	4,01%
7	Chery	682.100	3,78%
8	BYD	519.800	2,88%
9	Brilliance Auto	501.400	2,78%
10	JAC	458.500	2,54%
	sub-total	15.596.100	86,35%
	Others	2.465.800	13,65%
	total	18.061.900	100,00%

(CAAM 2011 [1])

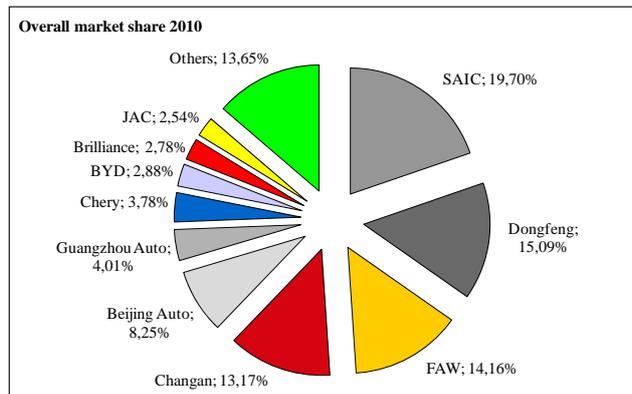


Figure 7: Overall market share Chinese car groups 2010

Having a look at Table 4 and Figure 8 the difference is obvious. For example is SAIC member of the top three car manufacturers. These top ten passenger car manufacturers account for 57% of total passenger car sales (CAAM 2011 [2]) and most of them are joint ventures with foreign car manufacturers.

Table 4: Top ten passenger car manufacturers by sales volume 2010

Rank	Group	sales 2010	Market share cars
1	SAIC-GM-Wuling	1.135.600	8,25%
2	Shanghai GM	1.012.100	7,36%
3	Shanghai Volkswagen	1.001.400	7,28%
4	FAW Volkswagen	870.000	6,32%
5	Chongqing Chang'an	710.000	5,16%
6	Beijing Hyundai	703.000	5,11%
7	Chery	674.800	4,90%
8	Dongfeng Nissan	661.000	4,80%
9	BYD	519.800	3,78%
10	Toyota	505.900	3,68%
	sub-total	7.793.600	56,65%
	Others	5.964.200	43,35%
	passenger cars total	13.757.800	100,00%
	commercial vehicles	4.304.100	
	total	18.061.900	

(CAAM 2011 [2])

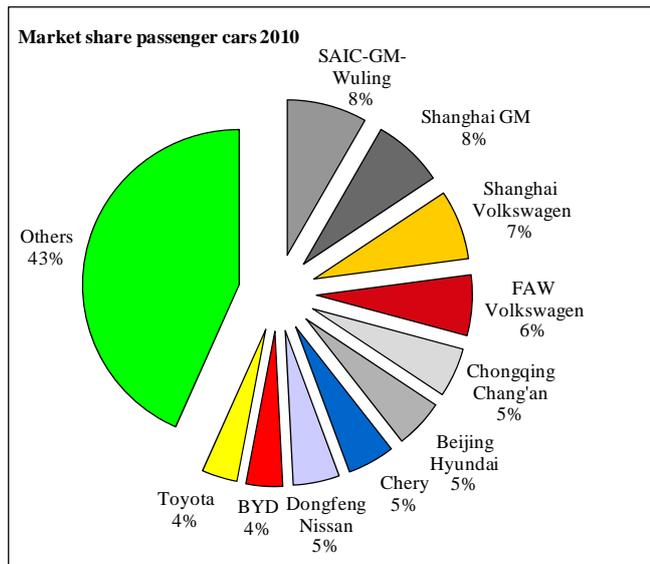


Figure 8: Market share passenger cars 2010

For this thesis remaining Chinese car groups are the top ten from Table 3 as listed below:

- SAIC (Shanghai Automotive Industry Corporation)
- DFM (Dongfeng Motor Corporation)
- FAW (First Automobile Works)
- Changan (Chongqing Changan Automobile Co.)
- BAIC (Beijing Automotive Industry Holding Co.)
- GAC (Guangzhou Auto Group)
- Chery (Chery Automobile Co.)
- BYD (Build Your Dreams Automobile Co.)
- Brilliance Auto (Brilliance China Automotive Holdings)
- JAC (Anhui Jianghuai Automobile Co.)

In order to align with the literature review (Sub-chapter 2.6.1), it is necessary to find out what type of enterprises the automotive companies are. As seen in Table 4 there are various foreign car companies active in China (e.g. VW, GM, Nissan...) but all of them in some kind of alliances. These partnerships' natures also need to be clarified to align it with the theoretical findings (Sub-chapter 2.6.2).

The up-coming sub-chapter is about the Chinese car manufacturers types of enterprises.

4.3.2 Types of automotive enterprises

This sub-chapter's aim is to find out what kind of automotive enterprises are common at the major Chinese car enterprises. To be evocative of the possibilities found in literature they are briefly listed in the following:

- State-owned enterprise
- Foreign private-owned enterprise (POE)
- Chinese POE
- Joint venture

For the special case of the automotive industry, the literature review shows that wholly owned foreign enterprises are not allowed. Foreign companies need to form joint ventures with Chinese partners and are not allowed to own more than 50 percent of the enterprise. Hence, for this thesis the scope of possibilities is reduced to SOE, Chinese POE and joint ventures.

An extensive internet research was performed to find out what kind of enterprises the top ten Chinese car manufacturers are. The results are presented in Table 5. It is very interesting to see that eight out of ten are SOE. The remaining two are Chinese POE. This industry picture confirms that none is a foreign-owned enterprise.

Table 5: Types of Chinese car enterprises

Rank	Company	Kind of Enterprise	Ownership	Reference
1	SAIC	State-owned	At least to 84 % property of state-owned shareholders.	(SAIC 2010)
2	DFM	State-owned	The holding company is Dongfong Motor Corporation ("DMC"), a state-owned enterprise.	(DFM 2011)
3	FAW	State-owned	State-owned enterprise	(FAW 2008)
4	Changan	State-owned	The contolling Shareholder is "China Changan Automobile Company Limited", a state-owned legal person.	(Changan 2010)
5	BAIC	State-owned	"Beijing Automotive Industry Holding Co., Ltd. (called BAIHC) is a wholly state-owned large enterprise."	(BAIHC 2011)
6	GAC	State-owned	Parent company Guangzhou Automobile Industry Group Co. is a state-owned enterprise and holds 92 percent of GAC shares.	(GAC 2011)
7	Chery	State-owned	Chery Automobile was founded in 1997 by five state-owned investment companies. The city of Wuhu is the controlling shareholder.	(Chery 2011, ChinaBizGov 2009)
8	BYD	Private-owned Chinese	The main shareholders are Mr. Lu Xiang-yang (Guangzhou Youngy Management & Investment Group) and MidAmerican Energy Holdings Company.	(BYD 2010)
9	Brilliance	Private-owned Chinese	Various shareholders. The controlling Shareholder is Huachen Automotive Group.	(Brilliance 2011)
10	JAC	State-owned	State-owned enterprise	(USTR 2011)

Remembering Table 4 it is visible that the majority of sold passenger cars results from joint venture activities of Chinese car enterprises together with foreign players. In order to be able to evaluate the car industry's structures better, the next sub-chapter provides an overview of the major joint venture activities.

4.3.3 Joint venture activities in the automotive market

Most of the leading Chinese car companies are involved in joint ventures with foreign car manufacturers. In an extensive internet research, many of these relationships were found and illustrated. For example is the Chinese car group SAIC member of joint venture activities with GM and VW (compare Table 6). These three joint ventures account for almost 23 percent of the entire Chinese passenger car market (also see Table 4).

Table 6: Automotive Joint venture activities in China

Rank	Company	Foreign partner	Joint Venture	Reference
1	SAIC	General Motors (GM)	Shanghai GM	(SAIC 2011, GM 2011)
			SAIC-GM-Wuling	(SAIC 2011, GM 2010)
		Volkswagen (VW)	Shanghai VW	(SAIC 2011, VW 2011)
2	DFM	Nissan	Dongfeng Nissan	(Nissan 2009)
		Honda	Dongfeng Honda	(Honda 2011)
		PSA Peugeot Citroen	DPCA	(PSA Peugeot Citroen [1] 2010)
		KIA Motors (& Yueda)	DYK Automobile	(Kia 2009)
3	FAW	GM	FAW-GM	(GM 2011)
		VW	FAW-VW	(FAW-VW 2011, FAW [3] 2011)
		Mazda	FAW Mazda	(FAW [1] 2011)
		Toyota	FAW Toyota	(FAW [2] 2011)
4	Changan	Suzuki	Changan Suzuki	(Suzuki 2009)
		Ford & Mazda	Changan Ford Mazda	(Media.Ford 2011)
		PSA Peugeot Citroen	Changan PSA	(PSA Peugeot Citroen [2] 2010)
5	BAIC	Daimler	Beijing Benz	(Mercedes-Benz 2011)
		Hyundai	Beijing Hyundai	(Hyundai 2010)
6	GAC	Toyota	GAC Toyota	(GAIG 2011)
		Honda	Guangzhou Honda	(GAGC 2011)
		Mitsubishi	GAC Mitsubishi	(SGPetch (2010)
		FIAT	GAC FIAT	(FiatSpa 2009)
7	Chery	----		
8	BYD	Daimler	BYD Daimler (future project)	(Daimler 2010)
9	Brilliance	Bayrische Motoren Werke (BMW)	BMW Brilliance	(BMW Brilliance 2011)
10	JAC	----		

As Table 6 and Figure 9 show, most joint venture activities happen together with just a few Chinese car groups. Those few car groups together with their joint ventures' production output are responsible for the majority of Chinese car production and sales. A bit more in detail it is shown in Table 4 that ten car manufacturers in China account for almost 57 percent of the passenger cars' sales volume in China. Eight of these top ten manufacturers are joint ventures with foreign car brands. In contrast to these eight joint ventures, Table 6 shows more than 20 car manufacturing joint ventures which are present in China. Thus it can be assumed that all these joint ventures account for the overwhelming share of the market.

By having a closer look at Figure 9 it is obvious that there are a few Chinese car groups which are in node-like positions. For example has GAC partnerships with at least four foreign car manufacturers. The same accounts for FAW and DFM. Also Changan which has at least three foreign partners seems to be in such a central position. Some of these foreign partners are also involved in partnerships with other Chinese car groups, so a network structure can be drawn.

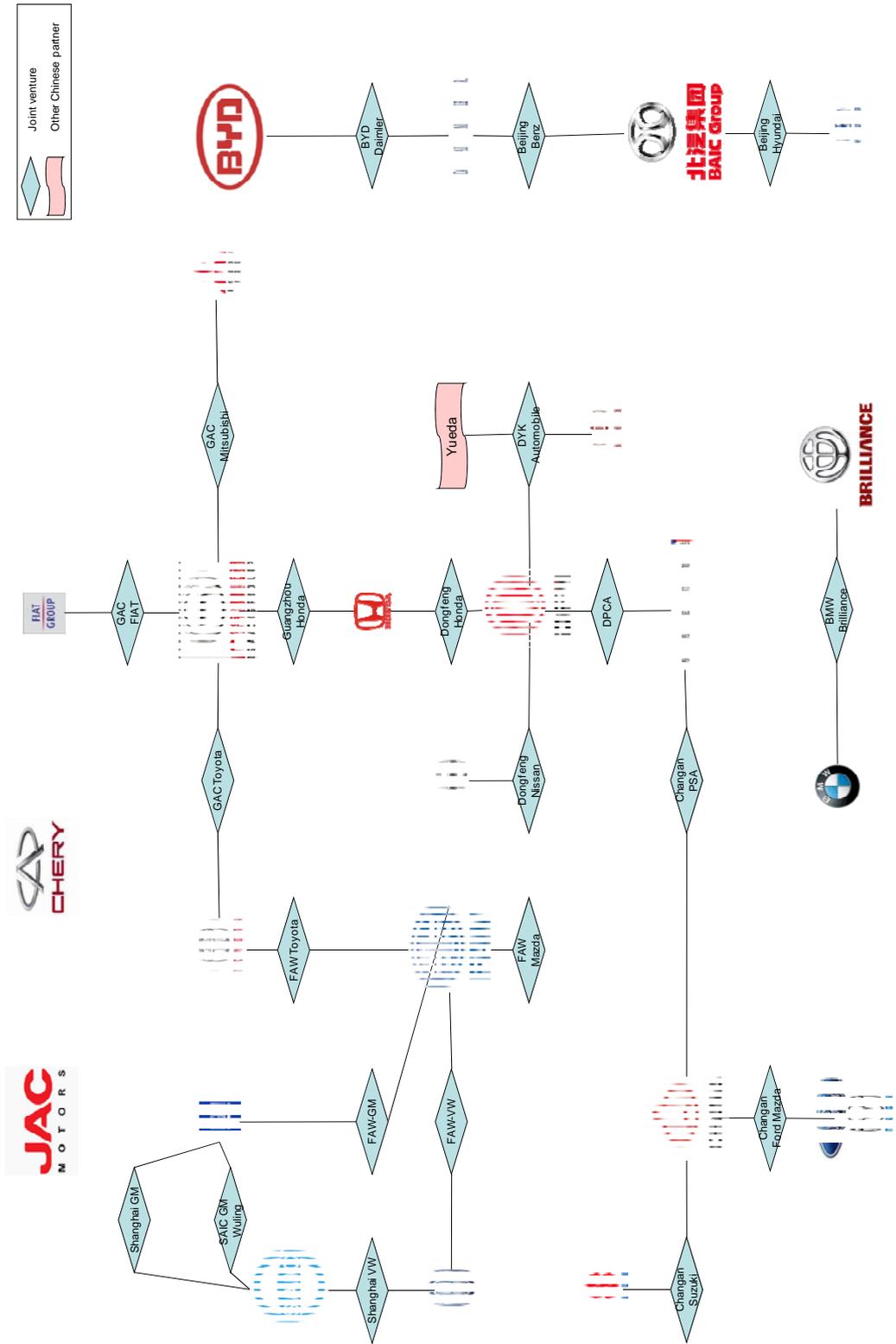


Figure 9: Car groups' and joint ventures' structure (own illustration)

4.4 Automotive third party logistics - Chinese industrial structures and their impact on foreign enterprises

As seen in the literature review (sub-chapter 2.6.3) there are different types of logistics provider companies possible and existent. Sticking to Lemoine and Dragnaes' (2003) categorization, there are three different types of logistics enterprises possible; wholly owned, joint venture and a firm's subsidiary or logistics department. For a good comparison it is reasonable to distinguish the joint ventures between vertical and horizontal as Selviaridis and Spring (2007) did. Thereby vertical joint ventures are between shippers and logistics providers while horizontal ones are between different logistics companies. Also a distinction between foreign and Chinese wholly owned companies is reasonable.

All 3PL companies which are significantly active in the automotive logistics market have been identified by using intelligence of the case company. Ten relevant logistics ventures are identified to be considered in this thesis. As all companies in the later coming survey do not want to be namely mentioned and do not want their main customers to be namely mentioned either, no company names are mentioned here. The companies are shown in Table 7 and each 3PL provider is given a replacement name which is absolutely sufficient for the purpose of this thesis.

Table 7: Significant automotive 3PL providers

Company Number	Type of logistics provider	Name for thesis use
1	Wholly-owned foreign 3PL provider	Foreign 1
2	Wholly-owned foreign 3PL provider	Foreign 2
3	Wholly-owned foreign 3PL provider	Foreign 3
4	Wholly-owned foreign 3PL provider	Foreign 4
5	Subsidiary of foreign car group	Subsidiary foreign
6	Subsidiary of manufacturing JV	Subsidiary JV
7	JV of foreign 3PL provider & domestic car group	JV 1
8	JV of foreign 3PL provider & domestic car group	JV 2
9	JV of foreign 3PL provider & domestic car group	JV 3
10	JV of foreign & domestic car groups	JV 4

As shown in Table 7, four of the major 3PL providers are independent and wholly-owned foreign companies (No. 1 – 4). Two companies are subsidiaries of car groups (No. 5 & 6); *Subsidiary JV* of a car manufacturing joint venture and *Subsidiary foreign* of a foreign car group. The remaining four logistics providers (No. 7 – 10) are logistics joint ventures. *JV 1*, *JV 2* and *JV 3* are cooperations between a foreign logistics provider and a domestic car group each, so these are vertical joint ventures. In the case of *JV 4* a foreign and two

domestic car groups created a joint venture for logistics purposes which can be seen as a horizontal joint venture. It is remarkable that no Chinese-owned enterprises have been significantly active in this segment so far.

To perform the questionnaire survey it was possible to establish contacts with industry insiders of six out of these ten companies. The questionnaire was sent to some of them, others including the case company were asked directly in an interview but asking the same questions. As a result answers from the companies *Foreign 1*, *Foreign 2*, *Foreign 3*, *Subsidiary JV*, *JV 1* and *JV 2* have been received and can be used for this thesis.

4.4.1 Questionnaire survey - market specific logistics services and compare different logistics services providers

There are various aims of the questionnaire survey in this thesis. The first aim is to serve research objective 2 - "Identify market specific logistics services and compare different logistics services providers in this environment". This is done by taking findings from the literature review into account. Thus the market specific logistics services (compare sub-chapter 2.5) were checked whether they are offered or not. The second aim is to clarify whether the market typical services which are identified in the literature review are common or not and if there is a difference in service offerings at different kinds of logistics companies.

Table 8 shows the answers of the questionnaire of all asked companies. The third aim of the questionnaire survey is to serve research objective 4 – "Detect industrial structures' influences on logistics services competition". By asking for the 3PL providers' main customers, it can be determined how strong their affiliations to their parent companies are – if those exist. As mentioned in the methodology chapter the respondents of the questionnaire were also asked to give additional comments if those are relevant to clarify things or if they want to add important information.

The findings from the questionnaire are very interesting as all six 3PL providers offer pretty similar services. But there are also slight differences. All companies offer all warehouse, distribution & consolidation and technology services as well as road transportation and import / export services. Four companies mentioned that barcoding & scanning and also tracking & tracing services are no standard services but available if regulated specifically in contract. For the remaining services, all companies are different.

It is worth mentioning that only the two joint venture logistics enterprises standardly offer other transportation modes than road and intermodal transportation.

Those companies who do not offer JIS delivery added that they would offer it but have no experience with this service so far. This is different to the services packaging design and sub-assembly. The firms *Foreign 1*, *Subsidiary JV* and *JV 1* have no knowhow on packaging design and could not easily offer such services. These companies mentioned if such services are requested, they can arrange a sub-contractor with necessary skills. *Foreign 1*, *Foreign 3* and *Subsidiary JV* do not offer sub-assembly services. *Foreign 1* mentioned in an interview that special licenses are needed for those services which the company does not possess.

Slight differences exist in the offered modes of transportation and the experiences in delivery services as well as in the scope of offered other services. The greatest and most obvious differences can be seen in the kind of customers the different types of logistics companies provide services for. Thus the wholly-owned foreign 3PL providers serve various different customers in the market, while the joint ventures mainly and the subsidiary only serves their parent companies.

Table 8: Questionnaire results

	Company	Foreign 1	Foreign 2	Foreign 3	Subsidiary JV	JV 1	JV 2
Automotive experience	Is the company active in automotive market?	Yes	Yes	Yes	Yes	Yes	Yes
Warehouse Services	Storage / warehousing in general	Yes	Yes	Yes	Yes	Yes	Yes
	Inventory management	Yes	Yes	Yes	Yes	Yes	Yes
	Receiving	Yes	Yes	Yes	Yes	Yes	Yes
	Order processing	Yes	Yes	Yes	Yes	Yes	Yes
	Picking	Yes	Yes	Yes	Yes	Yes	Yes
	Packing	Yes	Yes	Yes	Yes	Yes	Yes
	Assembly / kitting	Yes	Yes	Yes	Yes	Yes	Yes
Distribution & Consolidation Services	Distribution in general	Yes	Yes	Yes	Yes	Yes	Yes
	Consolidation in general	Yes	Yes	Yes	Yes	Yes	Yes
	Milk-run	Yes	Yes	Yes	Yes	Yes	Yes
	Cross-docking	Yes	Yes	Yes	Yes	Yes	Yes
	Direct deliveries	Yes	Yes	Yes	Yes	Yes	Yes
	Barcoding and scanning	Yes	Yes	Yes	Yes	Yes	Yes
Technology Services	Electronic data interchange	Yes	Yes	Yes	Yes	Yes	Yes
	Tracking / Tracing	Yes	Yes	Yes	Yes	Yes	Yes
	Shipping in general	Yes	Yes	Yes	Yes	Yes	Yes
	Road transportation	Yes	Yes	Yes	Yes	Yes	Yes
Transportation Services	Rail Transportation	No	No	No	No	Yes	Yes
	Water transportation	No	No	No	No	Yes	Yes
	Intermodal transportation	No	No	No	No	Yes	Yes
	JIT delivery	Yes	Yes	Yes	Yes	Yes	Yes
	JIS delivery	No	Yes	Yes	No	Yes	Yes
Delivery Services	VMI	Yes	Yes	Yes	Yes	Yes	Yes
	Import / export	Yes	Yes	Yes	Yes	Yes	Yes
Other services	Sub-assembly services	No	Yes	No	No	Yes	Yes
	Packaging design	No	Yes	Yes	No	No	Yes
	Nature of customer	Various car OEM and Parts manufacturers			Only parent company		

4.5 Chapter Summary

In this chapter all findings of the empirical research are presented and partly discussed. Perceptions from the interviews reveal the most significant barriers for 3PL companies from the practical point of view. These perceptions are aligned with literature. Some information are mentioned in literature as well and are reinforced by the interviewees, other information are new and can be added to the pool of theory in this area.

After that, insights in the automotive market are provided. Leading companies are presented and their types of companies are found out as well. Thus most of the leading car groups are SOE. In a next step it is shown which leading Chinese car groups cooperate with which foreign car manufacturers. By doing this the circumstance of some Chinese car groups obsessing node-like positions in the network of car manufacturers in China has become obvious. It is also shown that the overwhelming market share of passenger cars arises from joint venture productions with foreign car manufacturers.

In the automotive 3PL segment, various types of companies are present. Within the leading ten companies, there are wholly-owned foreign 3PL providers, subsidiaries of car manufacturers and special automotive logistics joint ventures. No Chinese-owned company has shown relevance in this sector so far. The questionnaire reveals that only slight differences in service offerings exist. These differences are not enough to categorize the competitors anyhow. The major difference at different kinds of 3PL providers can be seen in the kinds of customers they serve.

5 Analysis and discussion

In this chapter findings from both the previous chapter and the literature review are reviewed, discussed and analyzed in relation to the aim of this thesis and its research objectives respectively research questions. Therefore this chapter's structure is closely oriented on the research objectives in order to answer the research questions. To recall the overall aim of this thesis, it is *the investigation of the Chinese 3PL environment with the focus on automotive industry*. This chapter follows the research questions for the structure. Thus all matters concerning the first question follow in the beginning.

5.1 What are the barriers and conditions of the Chinese 3PL market considering the automotive market exemplarily?

This research question is answered mainly with the results from the literature review but also a bit from the answers of open-ended questions in the questionnaire survey. This research question's aim is to gather information about existing barriers for logistics services providers in China and where these barriers have their origin.

The literature review shows that China's 3PL market is still in an early stage compared with western markets (Tian et al. 2010). The reason for that can be seen in China's historical development. Problematic political impacts such as the planned economy did not allow the industry to develop in a need or demand focused way. Private enterprises had very limited chances and the superior SOE followed other interests than serving market's demand. Only late reforms and finally the entrance to the WTO made it possible for Chinese 3PL industry to start developing market and demand oriented. (Hong et al. 2007, Wu 2009) Still logistics costs in China are higher than in developed countries and the service standards are behind the demanded services as well (Waters 2007). Reasons for those are found in basically five areas which are categorized as the following:

- Infrastructure and equipment
- Supply and demand of logistics services
- Importance of relationships
- Legal issues
- Staff requirements

The first category *Infrastructure and equipment* describes problems arising from infrastructural and equipment related factors. China's transportation infrastructure cannot cope with the existing traffic (Wu 2009, Zhang & Figliozzi 2010) and thus leads to high transportation costs and long lead times (Zhao & LV 2009) which in turn lead to an increase of industry's product's prices. Not only insufficient quantity of transportation infrastructure also insufficient quality leads to problems. High transportation damage rates lead to increasing costs as well. (Coia 2011) These just mentioned conditions mainly describe those of roads, but the rail infrastructure is not sufficiently expanded either. Thus it is not possible to relieve roads by shifting cargo to rail (Zhang & Figliozzi 2010). In addition there is still a monopoly on Chinese rail which dictates transportation prices (Coia 2011).

Besides the lack of proper transportation infrastructure, also the transportation equipment lacks in terms of availability and qualification. Because of this there are areas in China where it is impossible to find needed transportation equipment. (Pearson et al. 1998, Coia 2011) The same applies for IT infrastructure and equipment which is not available everywhere and especially not available in the needed quality (Lau & Zhang 2006, Zhang & Figliozzi 2010, Tian et al. 2010, Jiang 2002, Pearson et al. 1998, Liu, Y. et al 2010).

Rarely a difference in the warehouse availability and conditions can be seen. Chinese warehouses widely lack state to the art technology in all aspects. This is mainly due to very low labor costs which does not justify expensive investments. The aspect of insufficient warehouse availability and conditions is also underlined by the respondents of the survey and thus can be seen as a barrier of high significance. (Lau & Zhang 2006, Pearson et al. 1998, Hong et al. 2007, Zhang & Figliozzi 2010)

The *Supply and demand of logistics services* are far away from each other. Integrated logistics services and single source solutions are rarely provided, especially not by domestic 3PL companies (Zhao & Lv 2009, Chin et al. 2007). Because of this automotive companies cannot concentrate on their business' core and cannot benefit from outsourcing logistics services as they should. Additionally the offered service quality is not on an adequate level. Thus there is a large gap to close for 3PL providers. Automotive companies ask for single source solutions and the ability to deliver high quality services. (Liu, Y. et al. 2010, Hong et al. 2007)

Because the respondents of the questionnaire survey underline that services as “barcoding & scanning” as well as “tracking & tracing” are only offered on special request, the survey supports the findings from literature that the industry lacks such services.

In general customers have made bad experiences over a long period of time and lost trust in Chinese 3PL providers. This trust needs to be gained back, but there are many fires to blow out as the logistics providers provide poor performances in many areas (Lau & Zhang 2006). As a major problem in this area, high damage rates at operations are addressed by the respondents of the survey.

More problems are arising from the low pricing competition which is widely discussed in literature and also mentioned as a major obstacle by the survey respondents (Wang et al. 2006, Chin et al. 2007, Wong 2007, Zhao 2009). This low pricing competition leads to very low profit margins which in turn lead to a decreasing ability to invest in new technology and equipment. These low margins together with the very limited service scope, which is often limited to basic warehousing and transportation services, lead to the need of changing something in 3PL providers business to gain competitive advantage (Hua et al. 2009). Broadly mentioned is the need to offer more value adding or creating services.

A crucial factor in Chinese business is the *Importance of relationships* between people referred to as Guanxi (Zhang & Figliozzi 2010, Lee 2011, Pearson et al. 1998, Wu 2009). Especially Guanxi to officials is seen as necessary to overcome barriers created by government and authorities (Jiang 2002, Wong 2007). But also for gaining new business contracts, Guanxi with industry’s managers is essential. This is highlighted by both literature and survey results and thus seems to be one of the most important factors.

Also *Legal issues* create barriers in the logistics environment. Literature describes transportation barriers created by different local and provincial authorities in China (Coia 2011, Hong et al. 2007). In practice this does not create a problem for 3PL companies. An interview in the case company resulted that due to the high degree of outsourced transportation services, they are not facing such problems. The 3PL providers rather choose transportation vendors which possess all necessary licenses. This in turn can worsen the availability of transportation equipment as mentioned above. If available resources cannot be used because of missing licenses, another problem is created.

Other legal impacts are seen in local protectionism of Chinese authorities which still try to keep outside competitors away (Zhang & Figliozzi 2010, Wu 2009, Tian et al. 2010). Another kind of protectionism grants companies who purchase locally manufactured equipment tax benefits (Jiang 2002). This can either influence profit margins respectively influence competition and also takes the ability away from 3PL providers to offer state of the art technology and services. This is due to the problem that often Chinese manufacturers cannot offer the needed equipment quality and latest technology (Pearson et al. 1998).

Mentioned by both literature and respondents of the survey is the circumstance of short-term outsourcing contracts (Wu 2009). Often only one year contracts are existent. This makes it difficult for logistics providers to make long-term investments which increase their expenses. Also short-term leasing contracts for equipment and warehouse facilities are very expensive. This circumstance can also be seen as a major barrier, 3PL industry is facing.

Staff requirements are another crucial problem realized by both literature and asked managers. A general lack of qualified and experienced staff (Wu 2009) and also senior managers is well known in literature (Liu, Y. et al. 2010, Pearson et al. 1998, Tian et al. 2010). Results from the questionnaire survey show that in addition to this lack, also a high fluctuation of staff creates problems which logistics companies are facing. Thus permanent teaching and training procedures need to be done which increase business costs as well and make it hard to keep a certain service quality. (Hong et al. 2007, Lau & Zhang 2006, Wang et al. 2006)

The second and next research question considers the provided logistics services in the market.

5.2 What are the services offered by 3PL companies in Chinese automotive environment?

For the purpose of answering this research question the literature review is used to find market specific services. In order to check if these services are offered in Chinese

automotive 3PL business, a questionnaire survey in the Chinese automotive 3PL industry was performed. Therefore different kinds of logistics companies stated which services they offer. In general conformity between theory and praxis is remarkable. Only slight differences exist in the offered modes of transportation and the experiences in delivery services. The more interesting difference, as this is an area for differentiation within the competition, is the fact that some companies do not offer other services such as sub-assembly and packaging design. No obvious differences between different types of companies can be identified so far. But all services mentioned in literature seem to be present in the industry.

The findings from the literature review about market typical services can be confirmed. Almost all services are standardly offered by all asked companies, but always at least half of the companies offer the services. These results show that those services are common in practice.

5.3 How do different kinds of 3PL companies differ in their service offerings?

The results from the questionnaire survey show that different 3PL providers and different kinds of 3PL companies offer slightly different services. But in general the service portfolios are very similar. A distinction by kinds of company from the perspective of service portfolio cannot be done.

As mentioned in the *Limitations and potential problems* section, only closed-ended questions are used for this part of the questionnaire. This approach presumes that services found in literature are complete, but possibly they are not. If so, there was no chance for the respondents to mention additional services they offer. This circumstance might bias the results of the survey.

5.4 Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry.

This third research objective is divided in three research questions:

- a. What kind of industrial structures is present in China and what are their influences on automotive manufacturing and logistics ventures?
- b. How do foreign companies act in the market?
- c. How does it look like in reality?

It is conspicuous that today's industrial structures are ruins of earlier years in China's history (comparing sub-chapter 2.6). Today two ways of differentiation are generally necessary: SOE and non-SOE. SOE are often not primarily profit oriented but non-SOE are. The non-SOE can further be differentiated in foreign POE and Chinese POE. In addition the creation of joint ventures is of great importance in China. Especially for car manufacturing ventures foreign car companies are not allowed to own more than 50 percent. Thus if foreign companies want to assemble cars in China they need to have a Chinese partner (Wang 2002). This is different in the logistics industry which is described later in this thesis.

For this thesis there are two types of ventures of interest; automotive manufacturing companies and 3PL companies. Have a look at automotive companies first. First differentiation is about the ownership of a company. Thus there are basically three modes possible; SOE, Chinese POE and joint ventures (Wang 2002). The findings part shows that eight of the top ten car groups in China are SOE and the other two are Chinese POE. Very interesting at the same time is that eight of the top ten car manufacturers are joint ventures between Chinese car groups and foreign car companies. This shows that the major market shares in the market are arising from the foreign companies' contributions. The findings additionally show a few more existing car manufacturing joint ventures which are not included in the top ten car manufacturers but which are also joint activities with the top ten Chinese car groups. It can be clearly seen that just a few Chinese SOE have dominant influence on an overwhelming part of the car market. These SOE obsess node-like positions as described in the findings chapter. Due to multiple joint venture activities of Chinese companies and foreign brands some kind of network is present in the automotive industry as illustrated in Figure 9.

The automotive 3PL industry looks totally different. As the literature review shows, there are theoretically three kinds of logistics ventures in the automotive sector possible; wholly owned company (Selviaridis & Spring 2007), subsidiary of car manufacturer and joint venture (Lemoine & Dagnaes 2003, Wong 2007). Thereby a further distinction in horizontal and vertical joint ventures (Lemoine & Dagnaes 2003) as well as foreign and Chinese wholly owned companies is reasonable (Selviaridis & Spring 2007). The findings show that within the most significant players in the automotive logistics market there are four wholly owned foreign companies, two subsidiaries of car manufacturers and four joint ventures for logistics purposes. Thereby three of these joint ventures are partly owned by foreign 3PL companies.

In the following, the three research questions concerning this third objective are briefly answered separately.

- a. What kind of industrial structures is present in China and what are their influences on automotive manufacturing and logistics ventures?

Automotive manufacturing ventures: As wholly-owned companies, only Chinese enterprises and mainly SOE are present in the market. This has legal reasons as wholly owned foreign ventures are not allowed in China. Thus foreign companies are only active in joint ventures together with Chinese partners. (Wang 2002)

Logistics ventures: Various company forms are possible - Joint ventures in horizontal and vertical directions, wholly owned Chinese or foreign and subsidiaries of car manufacturers. Present within the as major ten identified companies are wholly owned foreign companies, subsidiaries of car manufacturers and joint ventures. (Lemoine & Dagnaes 2003, Wong 2007, Selviaridis & Spring 2007)

- a. How do foreign companies act in the market?

Automotive manufacturers: Foreign car manufacturers are included in a variety of car manufacturing joint ventures.

Logistics ventures: Foreign logistics companies are active independently in wholly owned companies or in the framework of a joint venture activity with a car manufacturer.

a. How does it look like in reality?

Automotive manufacturer: A network of the car manufacturers is drawn in the findings part (Figure 9). It is conspicuous that just a few Chinese car groups are involved in a large number of joint venture activities with foreign car manufacturers. Joint ventures with various counterparts on both sides Chinese and foreign enterprises create a manufacturing network in the industry.

Logistics ventures: Due to the commitment not to publish the names of the respondents of the questionnaire survey (compare 3.4 Limitations and potential problems), the creation of an actual picture is not possible.

5.5 How do industrial structures influence logistics service competition?

This research question is tried to be answered by using results from the questionnaire survey regarding the customers. The results are very interesting in terms of categorization of different kinds of 3PL companies. This means that there are high similarities in the customers of the different types of logistics firms. The three wholly-owned foreign 3PL providers that answered the questionnaire have various car original equipment manufacturers (OEM) and parts manufacturers within their customers without having any specific affiliations. The two joint ventures of foreign 3PL providers and Chinese car groups focus mainly on the car manufacturing joint venture activities of their Chinese parent companies. They only have scattered business with other manufacturers while the subsidiary of the manufacturing joint venture only offers services for its parent company.

Due to these findings it can be assumed that those car groups which are a member of a logistics joint venture or which possess their own logistics subsidiary primarily contract out their logistics operations to their affiliated logistics providers.

6 Conclusion

This final chapter's purpose is to sum up all findings from this thesis and draw conclusions arising from these findings together with the set research objectives. Additionally recommendations regarding future research possibilities are provided. A short valuation concerning this thesis' contribution to knowledge is done in the end.

First of all it is necessary to remind of the research aim and objectives set in the beginning of this thesis. Thus the overall aim of the thesis is *the investigation of the Chinese 3PL environment with the focus on automotive industry*. The specific research objectives in this context are, to:

- 1) Identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services.
- 2) Identify market specific logistics services and compare different logistics services providers in this environment.
- 3) Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry.
- 4) Detect industrial structures' influences on logistics services competition.

Concerning the first research objective, *Identify barriers and conditions of the 3PL market, taking automotive market as an example market for 3PL services*, various things are found out. Major barriers exist in the areas of Infrastructure and equipment, Supply and demand of logistics services, Importance of relationships, Legal issues and Staff requirements. These topics are discussed in the previous chapter and there is no need to repeat it here. As most important barriers as they are highlighted by both literature and interviewees can be seen warehouse availability, customers' loss of trust due to 3PL providers' bad performance, the low pricing competition, the need for Guanxi, high fluctuation of staff and the circumstance of short-term contracts.

If the warehouse availability (Lau & Zhang 2006, Hong et al. 2007, Zhang & Figliozzi 2010, Pearson et al. 1998) creates a bottleneck in logistics operations, competition for the few available warehouses which meet customer needs increases. This leads to higher rents which increase operations' costs which in turn lowers 3PL providers' profit margins. This together with the low pricing competition (Wang et al. 2006, Chin et al. 2007, Wong 2007, Zhao 2009) which is present anyway can create significant problems for 3PL companies. The customers call for higher service qualities and a higher degree of

and more modern technological services. This is difficult to realize if profit margins are low. Together with short-term contracts, which also increase rents and leasing costs, there can only be very little financial range for 3PL companies to invest. 3PL companies need to find ways to gain competitive advantage (Hua et al. 2009) which makes customers being dependent on them. This is e.g. possible by offering more and better high value adding services. Another option might be building up long-term relationships and offer single-source solutions in order to create customer loyalty.

Guanxi is a crucial factor in Chinese business and cannot be changed (Zhang & Figliozzi 2010, Lee 2011, Pearson et al. 1998, Wu 2009). Companies that employ those people who obsess the best personal relationships are most likely to compete successfully. Not only this is one reason why headhunting in this industry is going on and thus the staff fluctuation will remain a problem. Companies need to find ways to keep their valuable staff.

The second research objective, *Identify market specific logistics services and compare different logistics services providers in this environment*, shows a few results as well. Literature is aware of services which are actually offered by 3PL companies in this environment. A broad bandwidth of services found in literature are offered in reality. No relevant differences in service offerings of different 3PL providers are identified, especially not in respect of different kind of companies. Thus all different kinds of 3PL companies generally offer same service portfolios with minor differences. None of the compared companies has a real competitive advantage which in turn indicates that differentiation in 3PL competition happens via price fighting. 3PL companies need to find ways out of this situation in order to gain higher profit margins. As mentioned above, one approach might be to concentrate more on value adding services, in order to create a competitive advantage (Hua et al. 2009).

For the objective three, *Assess the Chinese industrial structures and their impact on foreign enterprises and create an actual picture of the automotive industry*, interesting results emerged. It is shown that different types of companies are present in China. Especially in the automotive industry, SOE play an important role and are involved in the overwhelming share of the passenger car market. POE are only possible with Chinese ownership but these companies are not of very significant size. For foreign car manufacturers the only option to enter the market is joint venture activities with Chinese

partner firms (Wang 2002). Thus most passenger cars in the market are produced in such joint ventures. It is interesting to see that a few Chinese car groups together with their foreign joint venture partners create a network-like picture in the industry.

This is different with 3PL providers in the automotive segment. Besides wholly-owned Chinese firms, also wholly-owned foreign firms are possible (Selviaridis & Spring 2007). But also the presences of logistics joint-ventures which belong to Chinese car groups or logistics subsidiaries of car manufacturers are common (LEmoine & Dagnaes 2003, Wong 2007). Within the major companies identified in this thesis, no wholly-owned Chinese company is present. This aligns with literature as local Chinese 3PL providers have not been able to offer high quality services as demanded by the automotive industry (Wong 2007). Foreign companies in turn play a fundamental role in the automotive 3PL market, because they are active in both ways wholly-owned and independent 3PL providers as well as part of special automotive logistics joint ventures. The reasons for Chinese companies not being present in this market cannot be answered from this thesis' findings, but further research is suggested below.

For the last research objective, *Detect industrial structures' influences on logistics services competition*, most interesting conclusions based on assumptions can be drawn. An important finding from the questionnaire survey revealed that the logistics joint ventures mainly serve the manufacturing activities of their parent companies. Thus logistics services might be preferably outsourced to the own affiliated logistics company. If one of the major node-car groups as mentioned in the previous section is part of such a joint venture, wide areas of the market might be blocked for other independent 3PL providers to get business. Due to their affiliation to car groups and as a consequence thereof good relationships to the car groups, automotive logistics joint ventures are also in terms of Guanxi at the fore.

A general implication of the literature review is that many authors write about the difference between Chinese and western industries, but there is little knowledge about Chinese reality and especially latest reality. In other words scientific literature is very likely to be out-dated in this area of research. Thus further in-depth research in this field is needed. Some suggestions for further research are the following:

- Assess in detail the role of logistics joint-ventures in the Chinese automotive industry.
- Investigate the scope of service portfolios of 3PL companies which are active in the Chinese automotive industry and identify the range of needed value adding services.
- Investigate the gap between wholly-owned Chinese 3PL companies and the remaining 3PL providers in this market.

This Master's thesis contributes to the knowledge in this area of research in mainly one aspect. No research that assesses Chinese industrial structures in either automotive or automotive logistics industries in such a way has been found. This thesis provides an overview on both industries and their typical types of companies by combining both theoretical knowledge and industry observations. The results show that these structures may not follow ordinary market economic rules. Thus assumptions concerning competitive distortions are made and further research in this area is suggested.

References

The ordinary approach in scientific researches is to provide on list of references which includes all references used in the paper. For this thesis it is decided to provide two lists of references. First one is the *General Reference List* which provides all references used in the text and they are mainly of scientific nature. The second one is the *Reference List for Empirical Research: Internet Research*. It provides all references, mainly online documents, which are used for the empirical research of research objective three. This approach is chosen as there are so many non-scientific secondary data sources listed which might cause confusion.

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Appendix

Appendix 1: Explanation of services

Warehouse Services:

- Storage / warehousing in general
Storage and warehousing in general provides space and time for goods “to be produced and held for later consumption.” (Lambert et al. 1998)

- Assembling / kitting
(Light) assembling or kitting is the process of putting together different parts into defined units. Those parts need to be delivered together but due to kitting just before delivery, the kitting process reduces the stock of many different pre-built products. (Vitasek 2006)

- Picking
During the picking process products from the inventory are picked according to the order and provided to be packed and sent out. (Vitasek 2006)

- Packing
Packing is the process which follows the picking. All products of an order are put into appropriate containers. The packing happens in a way that the goods are secured for further handling and transportation. Usually the packing process includes labeling as well. During the labeling process all required data such as customer and destination and other necessary information are provided on the outside of the packaging. (Vitasek 2006)

- Inventory management
Inventory management is “the process of ensuring the availability of products through inventory administration.” (Vitasek 2006)

- Receiving
The receiving includes all actions performed during the physical receiving of goods. These actions include inspection of receiving goods in terms of quality and quantity as well as damages, identification of goods and definition of destination. (Vitasek 2006)

- Order processing

Order processing includes all systems and processes which are done to receive orders from customers, check and communicate their statuses to customers as well as filling the order and it available. Processes included are e.g. checking inventory status, customer credit, invoicing etc. All included processes are usually automated. (Lambert et al. 1998)

Distribution and Consolidation Services:

- Distribution in general

Distribution is a crucial component of outbound logistics and includes all processes from the manufacturer to the customer. Some examples of those processes are transportation, warehousing, inventory control, material handling, packaging... (Vitasek 2006)

- Consolidation in general

Consolidation is the combination of more than one shipment in one transport in order to realize lower transportation costs. (Vitasek 2006)

- Milk-run

Milk-runs are used for consolidating shipments. One truck picks up the shipments of different suppliers and delivers it to one customer instead of sending a truck for every single supplier's shipment. (Vitasek 2006)

- Cross-docking

Cross-docking "eliminates the storage and order picking functions of a warehouse while still allowing it to serve its receiving and shipping functions." In a perfect scenario shipments are transferred from the inbound truck to the outbound one without storing them at all. (Bartholdi & Gue 2004, Vitasek 2006)

- Direct deliveries

A direct delivery is the transportation from the source to the sink without any steps in between.

Technology Services:

- Barcoding and scanning

Barcoding is done for identification purposes of goods. Thereby a barcode is attached to or printed on the goods. By scanning these barcodes, a clear assignment of products can be assured.

- Electronic data interchange (EDI)

EDI is an “Intercompany, computer-to-computer transmission of business information in a standard format. For EDI purists, "computer-to-computer" means direct transmission from the originating application program to the receiving, or processing, application program.” (Vitasek 2006)

- Tracking / Tracing

Tracking is the monitoring of shipment movements while tracing is the recording of those. (Vitasek 2006)

Transportation Services:

- Shipping in general

Shipping or transportation in general is a logistics key activity. It provides the actual movement of goods from the source to the sink. Included in is also the selection of transportation mode such as road, rail, water and air as well as the selection of carrier. Also the routing for the transports and following regulations in the geographical area of the transport is included in the function of transportation. (Lambert et al. 1998)

- Road transportation

Transportation mode using the road – usually truck transportation.

- Rail Transportation

Transportation mode using the railway / trains.

- Water transportation

Transportation mode using waterways by ship.

- Intermodal transportation

Transportation during which more than one mode of transport is used.

Delivery Services:

- Just in time (JIT) delivery
“An inventory control system that controls material flow into assembly and manufacturing plants by coordinating demand and supply to the point where desired materials arrive just in time for use. An inventory reduction strategy that feeds production lines with products delivered "just in time". Developed by the auto industry, it refers to shipping goods in smaller, more frequent lots.” (Vitasek 2006)

- Just in sequence (JIS) delivery
“The Just in Sequence concept (JIS) is an advancement of the Just in time thought. During the supply in the JIS procedure the supplier ensures not only for it that the necessary modules are delivered in time in the necessary quantity, but also that the sequence (Sequence) of the necessary modules is correct.” (Economy-point 2011)

- Vendor managed inventory (VMI)
In a VMI process, the vendor or supplier is responsible to provide the needed stock at the customer’s site at every time. The aim is to “increase retail inventory turns and reduce stock outs.” (Vitasek 2006)

Other Services:

- Import / export services of parts and finished vehicles
“Movement of products from one country into another.” (Vitasek 2006)

- Sub-assembly services
“Collection of parts put together as a unit, to be used in the making of a larger assembly or a final or higher item. What may be a subassembly at one point, however, may be an assembly at another.” (BusinessDictionary 2011)

- Packaging design
“Packaging Promotes and Protects” (Lambert et al. 1998)
Packaging has various purposes. It can include advertisement and by having an attractive design it can also attract customer’s attention. Important information for customers can be included in the packaging but from the logistical point of view, packaging mainly serves the purpose of protecting the goods and simplify their handling. The right packaging secures during transportation and storage and

its design fits material handling equipment and warehouse configurations.
(Lambert et al. 1998)

Appendix 2: Interview questions

What is the most significant circumstance in the market that creates problems for your company?

If the interviewees needed more support for answering the question, following based on the literature review was added:

Are there any problems in the business environment of your company related to...

- Infrastructure and equipment?
- Supply and demand of logistics services?
- Importance of relationships?
- Legal issues?
- Staff requirements?

Appendix 3: Questionnaire

Please either tick "Yes" or "No" at the questions 1 - 27.

At question 28, please provide your main customers names and their relation to your company (e.g. Parent company) if this is not possible due to confidential agreements, please provide only the relation to your company.

No	Area of interest	Question	Yes	No
1	Automotive experience	Is the company active in automotive market?		
2	Warehouse Services	Storage / warehousing in general		
3		Inventory management		
4		Receiving		
5		Order processing		
6		Picking		
7		Packing		
8		Assembly / kitting		
9	Distribution & Consolidation Services	Distribution in general		
10		Consolidation in general		
11		Milk-run		
12		Cross-docking		
13		Direct deliveries		
14	Technology Services	Barcoding and scanning		
15		Electronic data interchange		
16		Tracking / Tracing		
17	Transportation Services	Shipping in general		
18		Road transportation		
19		Rail Transportation		
20		Water transportation		
21		Intermodal transportation		
22	Delivery Services	JIT delivery		
23		JIS delivery		
24		VMI		
25	Other services	Import / export		
26		Sub-assembly services		
27		Packaging design		
28	Customers	Nature of customer		

Figure 10: Questionnaire template