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PECULIARITIES OF GLOBAL LOGISTICS OPERATIONS WITHIN THE ASIAN MARKET- THE CASE OF CHINA

OSOBNOSTI GLOBALNIH LOGISTIČKIH OPERACIJA NA AZIJSKOM TRŽIŠTU- SLUČAJ KINE

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ABSTRACT:

Parallel to the economic growth and development of the People's Republic of China, the development of the logistics industry in this country took place. China today has the status of one of the leading countries in the field of logistics prosperity on a global scale. Investing in technical and technological innovations in logistics operations and partner cooperation with reliable logistics providers have the status of key predictors of the success of Chinese companies in the world market, which is a topic of detailed analysis within this paper. It is a great challenge for Chinese multinational companies to tackle the complexity of the international environment and generate savings and rationalization in different domains of managing the global supply chain.

**KEY WORDS:**

CHINA, LOGISTICS, TRANSPORT, GLOBAL SUPPLY CHAIN

APSTRAKT:

Paralelno sa ekonomskim rastom i razvojem Narodne Republike Kine odvijao se razvoj logističke industrije u ovoj zemlji. Kina danas ima status jedne od vodećih zemalja u domenu logističkog prosperiteta na globalnom nivou. Investiranje u tehničko-tehnološke inovacije u domenu logističkih operacija i partnerska saradnja sa pouzdanim logističkim provajderima imaju status ključnih prediktora uspeha kineskih kompanija na svetskom tržištu, što je predmet detaljne analize u ovom radu. Veliki je izazov za kineske multinacionalne kompanije izboriti se sa kompleksnošću međunarodnog okruženja i generisati uštede i racionalizacije u različitim domenima upravljanja globalnim lancem snabdevanja.

**KLJUČNE REČI:**

KINA, LOGISTIKA, TRANSPORT, GLOBALNI LANAC SNABDEVANJA

1. INTRODUCTION

The fact is that the environment in which international logistics operates is much more complex than the environment in which logistics operates in a national context. It is a great challenge to successfully manage the cumbersome and costly activities of international logistics. Less efficient infrastructure and procedures, long distances, large numbers of intermediaries and high risks of business decision making are some of the biggest problems facing companies operating in the global market. Chinese companies have proven successful in addressing the previously mentioned issues, and a real indicator of this is the widespread availability of Chinese products, both in the Serbian, European and world market. China no longer belongs to the below-average developed countries of the world. The world's most populous country is developing very rapidly, with increasing investment in the construction of its logistics industry.

The subject of research within this paper is to analyze the peculiarities of the organization of business activities of logistics operations in the Chinese market. Specifically, the dynamic development of China's transportation and logistics industry began in 2003, and has taken place in parallel with the country's economic development. Today, China has the status of one of the leaders in global logistics, as evidenced by the China Logistics Prosperity Index (LPI) since 2013, with value that has never dropped below 50. Data from the China Transportation Association of the PRC reveal that China received the status of one of the leading forces in the logistics industry's key areas of science in 2017.⁴ Continuous technological innovations globally and their implementation significantly improve the quality of services provided by logistics companies, thereby contributing to efficient and effective management of the supply chain.

The aim of the paper is to point out the complexity and long duration of logistics processes of Chinese companies focusing on the issues of transportation, packaging, storage, security and handling of products that a particular company buys or sells on the Chinese, European or world market. One of the key goals of Chinese companies' businesses is to manage their supply chain in the most efficient and effective way possible. Chinese companies are aware that global supply chains are easily disrupted when logistics companies are blindly trusted when organizing the transportation and export of products. The big challenge is avoiding these supply chain pitfalls. More and more companies are opting for the relocation of logistics activities, and business practice has shown that for successful relocation it is necessary to carefully choose logistics companies with which to establish cooperation, to adequately choose an approach that will help meet the needs of the fast-growing Chinese and global market and make the most of the lower distribution costs across central China.

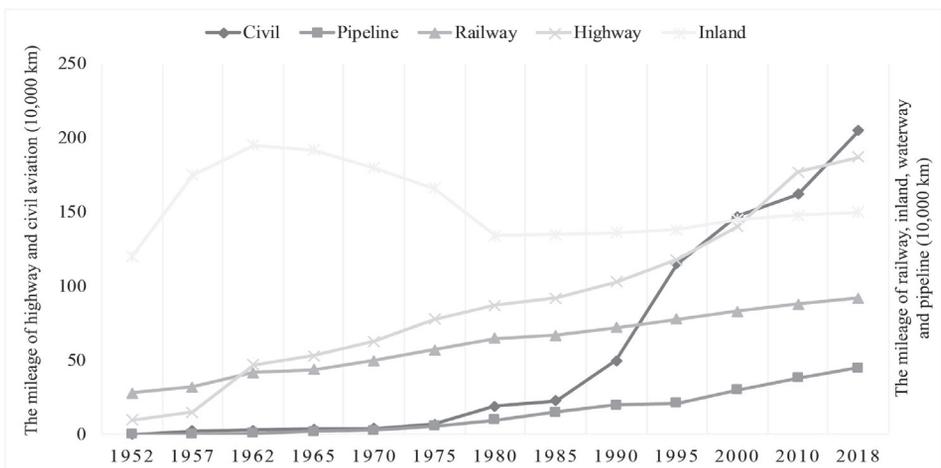
2. EVOLUTION OF TRANSPORT AND LOGISTICS IN CHINA

China's economy has been developing rapidly over the last 30 years. It is the largest economy in the world, right after the US. The reforms undertaken in 1978 economically

4 China Transportation Association (2019).

empowered this country and raised it above the poverty line. These are reforms that have directed a centrally planned socialist economy towards a market-oriented economy. The reforms brought with them a stimulation of foreign investment inflows and the recruitment of foreign experts of different profiles, which contributed to the penetration of positive business experiences from the West into the Chinese market.⁵ As part of the reforms implemented, effective measures aimed at the development of road, rail and air transport in this country were implemented (Figure 1). The measures taken have positively influenced the development of the transport industry. During the period 1952-2018 freight transport increased by all modes of transport, with the largest increase recorded by shipping (53.5% of total freight transport in 2016), which is a consequence of intensified foreign trade between China and the rest of the world.⁶ Research has shown that logistics costs in China were very high in the observed period, with transport costs dominating the structure. In 2018, logistics costs reached the level accounting for as much as 21.4% of GDP.⁷ This percentage has twice exceeded the logistics costs of developed countries in the world such as the UK (9.5%) and Japan (8.7%). The structure of logistics costs in China for 2018 was: transportation costs \$ 1,402.8 billion; storage costs \$ 737.6 billion and inventory management costs \$ 357 billion.⁸

► FIGURE 1. THE EVOLUTION OF THE TRANSPORTATION NETWORK IN CHINA (1952-2018)



Source: Zhou, W., Szyliowicz, J. (2019), "The Development and Current Status of China's Transportation System" *World Transport Policy & Practice*, Vol. 12., No.4, pp. 10-23.

During the period 2007-2018, China's foreign trade increased dramatically. The observed period was marked by an increase in exports of about 35% per year (Figure 2). To support the further development of trade, the Chinese government has taken a number of measures to improve the transport infrastructure and logistics industry. The measures taken showed positive effects in the period 2016-2018, when China's logistics industry

5 Shan, (2007), pp. 1-24.

6 China Transportation Association, (2019)

7 China Transportation Association, (2019)

8 China Transportation Association, (2019)

grew at a rate of 25% per year, resulting in a total value of US \$ 7.6 billion at the end of 2018.⁹ During this period, it was mainly invested in the development of the transport sector (80% of investments), and significantly less in the storage sector (3.9%). The most dynamic growth was recorded in the logistics industry in eastern China, where China's largest companies are located. In 2016, some 300,000 registered logistics companies developed from local transportation and warehousing companies. About 3 million transport service providers were registered in the same year, but large firms were small by international standards.

The period 2016-2017 marked the development of so-called "Third Party Logistics Firms" that enabled companies to outsource supply chain management.¹⁰ At the beginning of 2013, these companies carried out about 2% of logistics activities in China. In 2017, more and more companies were ready to hand over supply chain management to specialized companies.¹¹

► FIGURE 2. DEVELOPMENT OF LOGISTICS INDUSTRY IN CHINA BETWEEN 2007-2018 (BILLION USD)



Source: World Bank (2019), *An overview of China's transport sector*, East Working Paper No. 15, p. 42.

The development of logistics in China is best reflected in the fact that in the period 2007-2013 this country had the status of absolute leader in water container transport, with constant growth every year. In 2007, 103,823,024 million of tons were transported by this mode of transport (US 44,839,390), and in 2013 the volume increased to 184,080,330.3 million of tons.¹² This type of transport of goods in the period 2007-2013 dominated China, followed by trucking and rail.

During the period 2010-2014, China was facing huge demand for logistics services. At the end of 2014, it was estimated that about \$ 2.5 billion of investment in logistics development would be needed to meet the huge demand over the next fifteen years.¹³ The results of research conducted at the end of 2014 presented high tolls (30-40% of the

9 World Bank, (2019), p. 42.

10 Fu, Bill, Bentz & McCalla, (2018)

11 Liu, Lee, Wang, & Xu, (2018)

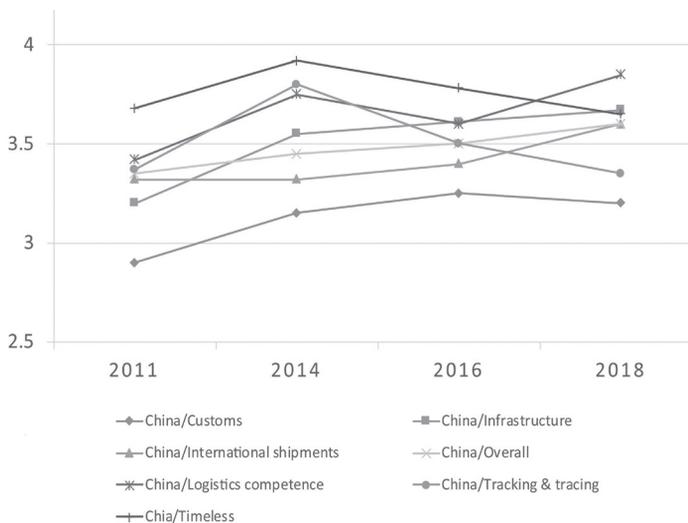
12 Leading countries in terms of container-port traffic, (2019)

13 Zito, (2015)

costs of transport companies) as a major obstacle to stimulating further progress of the transportation and logistics industry in China. The high cost of tolls not only reflected on the profits of the logistics companies but also caused the emergence of dangerous truck overload practices in order to maximize the available capacity for a given level of cost.

At the end of 2018, the World Bank ranked China in the top fifteen countries according to the Logistic Performance Criteria (LPI Index). In the period 2011-2018, China was ranked best in 2012 when it was ranked second, after Singapore. That year, the People's Republic of China was best rated in terms of the following predictors of the quality of logistics services: timeliness of delivery (4.28), price competitiveness of international shipments (4.18), and quality of transport and logistics infrastructure (4.12).¹⁴ A drastic drop in the ranking was recorded between 2012 and 2014 when China dropped from second place to the fifteenth position. In 2014, China received high marks for the timeliness (compliance with deadlines) of deliveries, but was given lower marks for the competitiveness of international shipments (3.58) and infrastructure (3.97).¹⁵ The reasons for the lower grades by the above criteria are the high cost of tolls and customs clearance (China's main lagging behind Germany's top ranked countries), which has reduced the competitiveness of international shipments prices and the need for additional investment in infrastructure, especially in the northern and western regions of the country (China was lagging behind in infrastructure investment that year compared to better ranked countries). Survey results at the end of 2018 showed that infrastructure improvement investments in second- and third-tier cities in China's northern and western corners would open up new markets for retailers and contribute to breaking up the over-concentration of transportation and logistics companies around the Pearl, Yangtze and Bohai Rim rivers.

► FIGURE 3. CHINA LOGISTICS PERFORMANCE INDEX DURING THE PERIOD 2011-2018.



Source: World Bank (2019), *An overview of China's LPI index*, East Working Paper No. 17, p. 56.

14 World bank (2019)

15 World bank (2019)

It can be concluded that the dynamic development of China's transportation and logistics industry began in 2003 and has taken place in parallel with the country's economic development. The year 2014 saw an increase in the volume of business and revenues of logistics companies in China, which influenced the classification of logistics companies among the countries of logistics prosperity. More and more companies are beginning to outsource logistics activities to manage their supply chain as efficiently as possible. Dynamic development continued during the period 2015-2018. In the continuation of the paper current trends will be introduced in the field of logistics operations in the Chinese business market.

3. KEY TRENDS AND PREDICTORS OF OUTSOURCING LOGISTICS ACTIVITIES IN CHINA

China Logistics Performance Index (LPI) is an indicator of logistic activity in this country on a monthly basis. This index has been calculated since March 2013 and has proven to be a realistic indicator of China's economic and business opportunities. The index is calculated based on questionnaires completed each month by about 300 logistics companies in this country. The questions in the questionnaire concern their logistics operations. An index value above 50 indicates prosperity and below 50 indicates a decline in development. The predictors that influence the value of this index are:¹⁶ new orders (30%), volume of business activities (25%), employment volume (20%), capacity utilization (15%) and inventory turnover (10%).

China's logistical performance is best represented by the fact that in the period 2013-2018 the LPI value has never fallen below 50. The survey results of logistics companies at the start of 2018 presented the following situation regarding the above listed predictors of logistics prosperity in China:¹⁷ 1) moderate growth in the volume of logistics activities, 2) slow growth in inventory volume in warehouses, 3) faster cash flow, 4) decrease in the cost of logistics services and 5) lower optimism of logistics companies in terms of market expansion, which is a consequence of very fierce competition in the market.

In 2018, the World Bank ranked China among the top twelve countries concerning the quality of logistics services. The total value of the logistics industry in China was about 280 billion yuan (US \$ 43.5 billion).¹⁸ This high value was the result of innovations in the technical and technological upgrading of logistics facilities and equipment. During the period 2017-2018 Chinese companies made serious progress in the field of industrial robotics and replaced the leading position of Japanese rivals. The reason why the development of industrial robotics did not fully reflect the competitiveness of China's logistics industry globally in 2018 is that Chinese companies do not yet manufacture key components for the production of warehouse robots, but instead buy them from international companies such as the German company Magacino.

¹⁶ Fung Business Intelligence, (2019)

¹⁷ Fung Business Intelligence, (2019)

¹⁸ Yan, (2018)

The period 2015-2018 has been marked by significant investments in transport infrastructure and the innovation of means of transport. In mid 2015, China launched the world's longest 9,800-kilometer freight route.¹⁹ This route connects the city of Harbin in northeast China with the German city of Hamburg. It is a train route that carries freight once a week, and the journey takes about 17 days, crossing the territory of China, Russia, Poland and Germany. Since 2015, this mode of freight transport has been intensively used and has halved the land and maritime transport by that time. At the Sino-Mongolian and Belarussian-Polish borders, the train has to change the lower trap due to differences in track widths in individual countries.

The acquisition of the Greek port of Piraeus (67%) by Chinese company COSCO in 2016 facilitated China-Europe logistics operations and facilitated the penetration of Chinese companies into the European market. Greece has received transshipment status for Chinese products going to Macedonia, Serbia, Hungary, Slovenia and Austria. Container ships from China arrive daily at this port. Maritime Container Transport, according to research results 2016-2018 has a significant role in China's foreign trade. This is why logistics companies invest the most in these means of transportation. At the beginning of 2018, the largest Chinese container ship (the largest ever to enter this port) sailed into the Greek port of Piraeus, the construction of which was completed at the very beginning of 2018. This is a Taurus ship of the Chinese company COSCO, which is 400 long meters and 58 meters wide, carrying 20,000 six-meter merchandise containers on the China-Rotterdam route.²⁰ Part of the cargo is unloaded in Piraeus, which has the status of one of the few ports that can serve it.

Freight transport in China, as an indicator of this country's economic activities, maintained steady growth in period 2016-2018. The country's economic expansion accelerated the pace in 2017, which was reflected in the volume of transport. China's railways, highways, waterways and airlines carried 47.15 billion tonnes of freight in 2017, increasing by 9.3% compared to 2016 levels. The largest increase was recorded in freight transport by rail (10.7% - 3.69 billion tons), while air transport reached the level of 7.06 million tons. Absolute dominance is freight transport by road (36.8 billion tonnes), while freight transport by water has reached the level of 6.66 billion tonnes. Road and sea transport have dominated China's foreign trade over the last three years.

The dynamic development of e-commerce has been a key driver of China's logistics and transportation sector development over the last three years. In 2015, China accounted for 43% of the global e-commerce market, followed by the US.²¹ In 2020, that share is expected to rise to as much as 59%, to \$ 4.06 billion.²² Companies that sell their products online outsource logistics services to effectively manage their supply chain (almost 70% of these companies), and with the increase in their market share, the companies providing these services are also advancing. The dynamic development of e-commerce in China is an indicator of the great purchasing power of the Chinese market. In parallel with the development of e-commerce in this country, primarily the development of e-retail as a B2C e-commerce model, the demand for logistics services is growing. With

19 Rail freight from China to Europe, (2019)

20 News regarding sea trade in Europe, (2019)

21 JLL, (2017), p. 4.

22 Jingxuan, (2015)

the development of e-commerce in China, there is a growing number of companies providing fast delivery of ordered goods. It is a type of transport company (courier service) that cooperates with Chinese companies that sell their products online (especially clothing, electronics and cosmetics) at home and abroad. These companies have their own distribution centers and combine different modes of transport during delivery. The largest number of courier services is located in Shanghai and in 2016 they generated as much as 71 billion RMB.²³

The results of the April 2017 survey showed that logistics companies have a share of about 21% in the Chinese service market. The largest logistics companies in China are state-owned and provide services both domestically and internationally: COSCO Logistics, SINOTRANS Limited, China National Post Logistics Ltd, China Material Storage & Transportation Corporation Ltd, China Railway Logistics and China Shipping Group. Analyses of the business practices of these companies have shown that SINOTRANS Limited and China Shipping Group are currently the most unsuccessful, and the reason is a focus on culture rather than customer satisfaction and performance. The advantage of these companies is that they have a developed transportation and storage network. Private logistics companies in China are more cost-effective than state-owned logistics and are geared toward customer satisfaction. Shanghai-based EAS International Transportation Ltd has the status of one of the most successful private logistics companies in China. In the following, we will introduce ourselves to the business practices of the most successful Chinese logistics companies.

Establishing cooperation with a trusted logistics partner significantly affects the efficiency and effectiveness of supply chain management. Chinese companies are aware that global supply chains are easily disrupted when logistics companies are blindly trusted when organizing the transportation and export of products. The big challenge is avoiding these supply chain pitfalls. The business practices of Chinese companies have crystallized the key predictors of successful logistics services outsourcing:²⁴

- *Careful selection of a logistics company to partner with* - There are thousands of small logistics companies in China. It is a great challenge to establish cooperation with one that will contribute to the efficient management of the supply chain, as small mistakes can lead to catastrophes. Business practice has shown that the advantage of small logistics companies in China is the provision of personalized service, but most often with the addition of time and frustration with the supply chain. These companies only play the role of cargo coordinator, who very often transport goods by bicycle from production sites to the airport / port. Small logistics companies in China are recognized for contracting export / import documentation, which is also one of the disadvantages of establishing cooperation with them. The fact is that foreign trade companies need to establish cooperation with logistics companies that have a network of offices around the world, an information system developed and compliance with import and export regulations / procedures. Establishing cooperation with such companies does not mean that a specific foreign trade company will face high costs. The benefits of working with these companies certainly outweigh the cost level. Expeditors International of Washington, Inc., CEVA Logistics, DB Schenker, and

23 Fung Business Intelligence, (2017)

24 Nine rules for logistics in China, (2019)

Kuehne & Nagel International AG (large logistics companies operating in China) have presented on their sites the advantages they offer: ^{25, 26, 27, 28}1) standardization and consistency of procedures worldwide, 2) up-to-date information on import / export regulations, 3) knowledge and compliance with standard regulations and protocols, 4) global IT document flow monitoring systems, 5) partnerships with shipping, air and road carriers, 6) assistance in completing documentation.

- *Determine the best approach to meet the needs of the fast-growing Chinese market* - The rise of China's middle-class population and the existence of a huge market in the People's Republic of China have stimulated both domestic and foreign companies to intensify their presence in the same. It is very important to keep in mind that Chinese distribution channels may be slightly more complex than US channels. Business practice has shown that it is best to focus product placement on major Chinese cities through large logistics companies. Small-town retailers open facilities in smaller cities, most often establishing cooperation with local logistics companies, often requiring seven or more days to deliver goods from one truck to another all the way to a specific store. It is a great challenge to choose an approach that will deliver the right product to the right place, at the right time, at the lowest possible cost.
- *Take advantage of the central part of China when distributing goods in this country's market* - Low storage costs and extensive, low-cost labor are key benefits of opening distribution centers in this part of the country. The PRC government has significantly invested and modernized rail and road links to this part of the country, facilitating and accelerating transportation to other parts of the country. Financial and tax breaks are also an incentive to open distribution centers in central China.

It can be concluded that it is a great challenge to find and establish partnerships with a reliable logistics company with experience in the field of freight forwarding, warehousing and transportation, both in China and worldwide. Effective and efficient supply chain management is the key to the success of any Chinese company, and working with proven and trusted logistics companies is a significant contributor to this goal.

4. PERSPECTIVES OF DEVELOPMENT OF THE LOGISTICS INDUSTRY IN THE MOST POPULOUS COUNTRY OF THE WORLD

Logistics companies are very important in the supply chain. Continuous technological innovations on a global scale, and implementation thereof, enhancing the quality of services provided by logistics companies, thus contributing to the efficiency and effective management of the supply chain. Research findings presented in early 2018 indicate that China is well on its way to becoming a global leader in political, military, economic and environmental issues over the next three decades. Data from the National Science Foundation of the PRC reveals that in 2017 China gained the status of one of the leading

25 Expeditors, (2019)

26 Ceva Logistics, (2019)

27 DB Schenker, (2019)

28 Kuehne&Nagel, (2019)

powers in the domain of key areas of science and technology. The US and China are the countries most exploring R&D activities. Over the last eight years, China's growing investment in IR activity has been growing at an annual rate of about 18%, almost four times faster than the US. Technological innovations in China's logistics industry can be established in the following categories: ^{29, 30, 31} 1) Data Acquisition Technology - Continuous work on improving the data collection and deployment system, using the RFID system bar; 2) Information technology - information technology is one of the key predictors of the productivity and competitiveness of logistics companies. Big investments in the use of EDI, EOS, POS, information systems; 3) Technology Warehouse - Improvement of the design and management of the storage space system (improvement of characteristic objects and movement of the dress): automatic storage, a system for finding dresses and sorting; 4) Transport technology - innovations in the field of transport information systems, global positioning system (GPS), geographic information system (GIS), radio frequency based communication system.

China is one of the countries leading the world towards a revolution in the application of automation and robotics in the manufacturing and logistics process. This is evidenced by the results of a survey that showed that about 451,000 robots were installed in a Chinese company in 2017, and this number is expected to increase to 950,000 by the end of 2020. ³² It is expected that by the end of 2019, following current investment in this domain, China will maintain its leading position. The People's Republic of China was one of the leaders in the implementation of current technical and technological solutions in the field of transportation and logistics. This country is recognizable for what has happened in the last couple of years, along with the US and Japan, dictating logistical trends globally in the field of modern technical and technological solutions.

The period until 2020 will mark the shift in the balance of global trade from West to East. China, India and Russia are expected to dominate world trade. With the help of foreign direct investment and government support, China is continuously working to modernize its roads, railways, airports and ports. Chinese foreign trade companies are using today, and in the future, will benefit even more from the benefits offered by host countries (partners) in Africa, Latin America and the Middle East, and will increasingly locate labor intensive production in the territories of these countries in order to minimize costs. That is why it becomes a great challenge to establish cooperation with reliable and proven logistics companies in order to manage supply chains effectively. Outsourcing of logistics activities will become a daily routine in Chinese companies' businesses, and logistics companies will need to expand the range of services they provide in order to survive in the market: packaging, labeling, tailoring products/packaging to local requirements. Logistics companies will be responsible for protecting life environment and finding environmentally friendly transportation and packaging solutions. Long-term partnerships will be developed in relation to the Chinese foreign trade company-logistics company and one of the key goals will be to achieve the effects of economies of scale. In the simplest terms, complete outsourcing of logistics operations in the Chinese market is expected, which will change the strategies, structures and operations of logistics companies.

29 Lin., Ho & Hy, (2007), pp. 3-4.

30 Zhang & Figliozzi, (2010)

31 Kewill, (2013)

32 China insights, (2019)

5. CONCLUSION

The dynamic development of China's transportation and logistics industry, started in 2003, has taken place in parallel with the country's economic development. Chinese companies are aware that global supply chains are easily disrupted when logistics companies are blindly trusted when organizing the transportation and export of products. The big challenge is avoiding these supply chain pitfalls. More and more companies are opting for outsourcing of logistics activities, and business practice has shown that successful outsourcing requires careful selection of logistics companies with which to establish co-operation, choose an approach that will help meet the needs of the fast-growing Chinese market and maximize the use of lower distribution costs through the central parts of China. Outsourcing of logistics activities will become a daily routine for Chinese companies, and logistics companies will need to expand the range of services they provide in order to survive in the market: packaging, labeling, product/package customization.

Logistics companies play a very important role in the supply chain. Continuous technological innovations at the global level, and their implementation, significantly improve the quality of services provided by logistics companies, and thus contribute to efficient and effective supply chain management.

The current trends in transport and logistics of China can be summed up in three points:

- The complexity of the international environment determines the efficiency and effectiveness of the logistics operations of Chinese companies, and therefore their competitiveness at the global level.
- Trends in the economy, mostly determined by the recession, require Chinese companies to save more and rationalize what they find, as a rule, in the various domains of global logistics management.
- Technical and technological innovations in the field of logistics operations and the establishment of cooperation with reliable 3PL providers have the status of important predictors of the competitive advantage of Chinese companies operating in the world market.

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