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Contemporary Logistics in China

Consolidation and Deepening

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Preface

This book is the third volume in the series entitled "Contemporary Logistics in China," authored by researchers in the Logistics Center at Nankai University. In the spirit of the two predecessor volumes, published in previous years, this book carries on the ideal of providing a systematic exposition of the logistics development in China to the English-reading community at large. Our ultimate aim and desire is to present a timely portrayal of the rapid pace of growth of China's logistics market and the status of its logistics industry's evolution. In so doing, we strive to offer an in-depth analysis of the hot issues and the dilemma amid the ongoing dynamic and multifaceted development and a source of reference for interested readers in the academic and professional fields.

The present work is founded on the research findings of a score of scholars in the Logistics Center, in writing the most recognized "Annual Logistics Report in China" (referred to as the *Blue Book*), published in Chinese for the past ten years. The *Blue Book*, acclaimed by knowledgeable readers of the field as the most systematic and authoritative research report of its kind, prides itself in combining data integrity, analytic rigor, and fresh perspectives. This series of books in English, though created as a companion publication, possesses these unique characteristics in terms of themes, coverage of subjects, and orientations to afford the English readers a balanced view on the contemporary logistics of China.

This book comprises 13 chapters, organized into four sections. The introductory section, consisting of four chapters, depicts the current development status of the logistics environment, the logistics market, the logistics infrastructure, and the logistics policies. The first three chapters describe the relevant statistics in a 5-year rolling fashion and give a longitudinal view of the recent trend; they also discuss the latest logistics development in a rapidly changing economic and social environment. Chapter 4 focuses on the policy aspects as the Chinese Government heightens its emphasis on transforming and strengthening the logistics industry. Major policy issues put forward in the "12th Five-Year Plan" and the "National Nine-Guidelines" are outlined to give a glimpse of the mindset of the Central planning agencies.

Section 2 turns the attention to the logistics development of three regions—the Pearl River Delta, the Wuhan Metropolitan Cluster, and the Inner Mongolia Autonomous Region. The Pearl River Delta has played a locomotive role in China's booming economic growth in the past decades; it is now leading the way in integrating multiple modes of land, ocean, and river transport and international collaboration. The Wuhan Metropolitan Cluster, with its solid industrial base, inland ports, and sprawling transportation network, has become a key area which the Government is leveraging to bolster the overall development of the Central Region. The economic and logistics development in Inner Mongolia has witnessed a notable rise in recent years as its distinctive industries in energy, metallurgy, and agriculture have been enhanced; increased trade at border ports also points to further needs in improving the logistics channels.

The third section addresses the logistics characteristics of three rapidly expanding industries in China—the e-commerce industry, the chain business, and the medicine industry. The modes of logistics operations, the specific logistics requirements, the supply chain relationships, and the development trend of these industries are analyzed respectively as these industries grow and prosper in modern society. The final section, consisting of three chapters, discusses some hot logistics topics in China. Chapter 11 accounts the essential subject of logistics cost in China—the components and their relative weights, the upswing of logistics cost, and the plausible means of curbing the escalation. The next chapter is on the promulgation of coordinated development of manufacturing and logistics. This closer collaborative relationship, evolved gradually among firms in the two sectors, has been vigorously promoted by the Government recently. The chapter reports on some encouraging results from various pilot studies and notes certain points for improvement. The last chapter of this section presents the development of the cross-border logistics system of inland China. China has a long inland border with many neighboring countries and complex political and economic relationships. As logistics nodes and channels along the border have been established and improved, numerous operational modes of cross-border logistics are also being implemented.

Besides being unique in nature and comprehensive in content, this book possesses several outstanding features. Firstly, the topics in Sects. 3 and 4 are carefully chosen to reflect the current hot topics in China's logistics scene. Subjects on chain business, medicine industry, rising logistics cost, collaborative development of manufacturing and logistics enterprises, and cross-border logistics are studied and analyzed in depth to provide the readers a fair understanding and a solid basis for further research on these subjects. Secondly, Section 2 focuses on three key areas mentioned above as flourishing representatives in the Eastern, Central, and Western Regions; the placement, the traits, and the development status of the logistics industry in each region are critically explored. Finally, the analyses presented in this book are both quantitative and qualitative in nature. Relevant data are obtained via appropriate published sources, expert interviews, and market surveys; conclusions are drawn based on a careful analysis and synthesis of the objective and subjective information.

As much as we strive to make this series of books a useful source of information and a handy tool for grasping the vibrant logistics development in China, we are well aware of our limitations inherent in such an endeavor. We earnestly welcome your suggestions and comments in making this effort worthwhile for all our valued readers.

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Chapter 1
China's Logistic Development Environment

Zhilun Jiao

In 2011, China continued to accelerate the changes to its pattern of economic growth, reinforcing and improving its macro-control policy, and maintained a steady and rapid development of its national economy. It issued the *Twelfth Five-Year Plan for National Economic and Social Development of the People's Republic of China* and various supplementary policies to encourage and unify the development of its logistics industry and build up a favorable policy environment for this industry.

This chapter describes the macro-economic and policy environment of China's logistic development. The first section sets out the economic environment for China's logistics in aspects of national economy, international trade, fixed asset investment, domestic demand, regional economy and production factor price. The second section depicts the policy environment for China's logistics development under the "Twelfth Five-Year Plan," as well as major logistics policies, industrial policies, regional policies and energy conservation and emission reduction policies.

1.1 Economic Environment for China's Logistics Development

In 2011, the world economy underwent a tough and tortuous recovery under the impact of international financial crisis. China continued to accelerate the conversion of its economic growth pattern and maintained a steady and rapid growth as a whole. The Government actively encouraged consumptions, investments and imports and exports, propelling the nation's economy and further boosting the coordinated development of its regional economy. Under such an economic environment, China's logistics industry has also realized a steady pace of growth.

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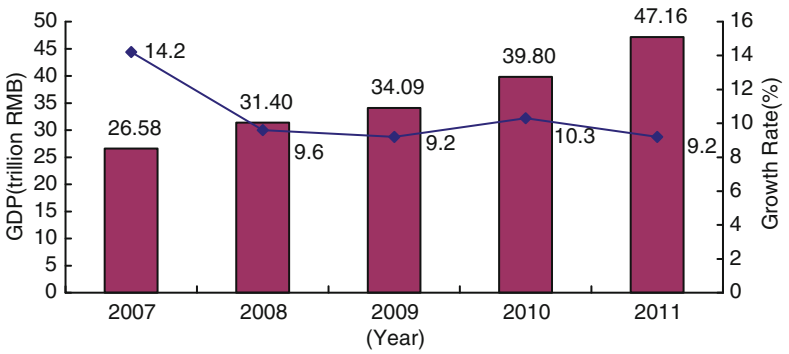

Fig. 1.1 China's GDP and Growth rate for 2007–2011 (Source: Compiled from the *China Statistics Yearbook (2011)* and related data in the *2011 China Statistical Bulletin of National Economic and Social Development*, published by the National Bureau of Statistics of China, 2012-2-22)

1.1.1 Smooth Adjustment of National Economy

China's overall national economy maintained a rather rapid growth in 2011. But compared with that in 2010, the growth rate declined slightly. The annual gross domestic product (GDP) amounted to 47.2 trillion RMB,[1] ranking second in the world. The year-on-year growth rate, calculated in comparable price, is 9.2 %, which is 1.1 % points lower than that in 2010. The GDPs and growth rates for 2007–2011 are shown in Fig. 1.1.

In recent years, investments and consumptions have been the major driving force to China's economic growth; the pulling effect of consumptions to GDP has risen gradually, while under the impact of international financial crisis, the pulling effect of imports and exports has weakened. Figure 1.2 shows the contribution ratio of investments, consumptions and imports and exports to GDP growth. In 2011, the gross capital formation still took the highest proportion at 54.2 % in the contribution ratio to GDP growth. The contribution ratio of final consumption reached 51.6 %, increasing by 14.3 % points compared to 2010, evidencing that the pulling force of consumption has been further enhanced. Affected by international economic fluctuation, the contribution ratio of China's goods and service net export was −5.8 % in 2011.

[1] Unless specified otherwise, all statistical data and conclusions in the report are for China Mainland, not including Hong Kong, Macao and Taiwan. For the logistic development in Hong Kong and Taiwan, please refer to the 2011 edition of the report (Binglian Liu etc. "Contemporary Logistics in China: An Introduction," pp. 102–144, published by World Scientific, Singapore, 2011.) The logistics industry for Macao is not accounted for due to its limited area coverage and an economy predominantly induced by the gambling industry.

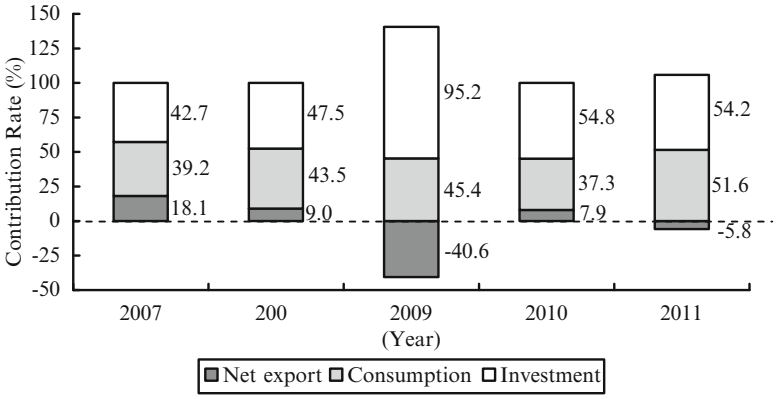

Fig. 1.2 Contributions of three major sectors to GDP growth for 2007–2011 (Source: Compiled from the *China Statistics Yearbook* (2010) and information released at the press conference on China's economic performance in 2011 by Ma Jiantang, the Commissioner of the National Bureau of Statistics in China)

In 2011, China's logistics industry realized a steady growth. Total value of social logistics[2] reached 158.4 trillion RMB, with a year-on-year growth of 12.3 %, calculated in comparable price. However, compared to 2010, the growth rate of total value of social logistics declined by 2.7 % points. The national logistics added value was 3.2 trillion RMB, with the year-on-year growth of 13.9 %, calculated in comparable price, representing a growth rate 0.8 % points higher than that in previous year.

1.1.2 Slowdown of the Growth of International Trade

In 2011, the world economy was slowly recovering from the international financial crisis of the previous years; the developed economies saw a sluggish growth and the emerging economies also slowed down their growth. According to data published by the International Monetary Fund (IMF),[3] the growth rate of world output in 2011 was 3.8 %, down by 1.4 % points compared to the previous year; of which the emerging and developing economies held a growth rate of 6.2 %, while that of the advanced economies was only 1.6 %. These growth rates represent the decrease of 1.1 and 1.6 % points, respectively, compared with those in 2010. The GDP growth rates of China's principal trade partners—the United States, Germany, Britten, France and Japan were 1.8 %, 3.0 %, 0.9 %, 1.6 % and –0.9 %, respectively.

[2] Total value of social logistics refers to the total value of all items that enter the social logistics for the first time and have been or are being delivered to the final users through logistics services during a certain period.

[3] "Global Recovery Stalls, Downside Risk Intensifies," World Economic Outlook, published by the International Monetary Fund (IMF), Washington DC, 2012-1-24.

Table 1.1 Growth rate of world trade volume (goods and services) (2008–2011) (Unit: %)

Year	World trade volume (goods and services)	Import		Export	
		Advanced economies	Emerging and developing economies	Advanced economies	Emerging and developing economies
2008	2.8	0.5	8.9	1.8	4.4
2009	−10.7	−12.4	−8.0	−11.9	−7.5
2010	12.7	11.5	15.0	12.2	13.8
2011	6.9	4.8	11.3	5.5	9.0

Source: Compiled from the *World Economic Outlook (2010–2012)* by the International Monetary Fund

In 2011, the growth of world trade volume fell significantly. The annual growth rate of goods and services trade volume was 6.9 %, dropping by 5.8 % points compared with that in 2010. Table 1.1 shows the growth of imports and exports in advanced economies, and emerging and developing economies for 2008–2011.

In 2011, China's total volume of imports and exports has kept a steady growth, but with a declined rate than that of the previous year. The annual total volume of imports and exports was 3.64 trillion USD, showing a year-on-year growth of 22.5 % and declined by 12.2 % points. The exports amounted to 1.89 trillion USD, with a year-on-year growth of 20.3 %; the imports amounted to 1.74 trillion USD, with a year-on-year growth of 24.9 %. The total net exports were 155.1 billion USD, decreased by 28.0 billion USD from the previous year, and causing a reduction in trade surplus.

Under the impact of declined growth of total imports and exports volume and the price hike of international bulk commodities, China's international logistics market slowed down its growth in 2011. The total cargo throughputs for ports above designated scale were 9.07 billion tons, increasing by 11.9 % over the previous year, with the growth rate declined by 3.1 % points. Among which, the cargo throughputs of foreign trade were 2.75 billion tons, increasing by 10.8 % over the same period last year, with the growth rate declined by 2.8 % points. The container throughputs of ports above designated scale were 162.31 million TEUs, increasing by 11.4 %, with the growth rate declined by 7.4 % points. The cargo and mail transport volumes of China's civil airports were 5.53 million tons, decreasing by 1.8 % over the same period last year. Among which the cargo and mail transport volumes of international routes were 1.76 million tons, decreasing by 8.4 % over the same period last year. And the cargo and mail transport volumes of Hong Kong-Macao-Taiwan routes were 207,300 t, decreasing by 4.3 % over the same period last year.

1.1.3 Sustained Growth of Fixed Asset Investment

The total fixed asset investment for 2011 was 31.1 trillion RMB, increasing by 23.6 % over the previous year, with a slightly reduced growth rate; of which the investments in the Eastern Region, the Central Region, the Western Region and the

Northeastern Region were 13.03 trillion RMB, 7.22 trillion RMB, 7.58 trillion RMB and 3.27 trillion RMB, respectively, amounting to increases of 20.1 %, 27.5 %, 28.7 % and 30.4 % over the previous year.[4]

By 2010 the government initiated national investment plan with the total amount of 4 trillion RMB,[5] which allotted a substantial portion of the funds to transportation infrastructure, had been dispensed. The growth rate of investments in China's transport field in 2011 fell back to the previous level. The nationwide fixed asset investment in the industries of transport, storage and post over the whole year was 2.73 trillion RMB, representing a mere growth of 1.8 % over the previous year, and a drop of 17.7 % points. The fixed asset investment in highway and waterway transport was 1.45 trillion RMB, increased by 9.5 % over the previous year with the growth rate declined by 9.1 % points; the investment in railway was 590.6 billion RMB, declined by nearly 30 % compared to 2010. The investment in civil aviation infrastructure and technological transformation was 68.8 billion RMB, increased by 6.4 % compared to 2010, with the growth rate declined by 2.3 % points.

1.1.4 Substantial Growth of Domestic Consumption

In 2011, China's domestic consumption grew substantially. The total retail sales of social consumer goods reached 18.39 trillion RMB, increasing by 17.1 % over the previous year. Among which the retail sales of urban consumer goods was 15.96 trillion RMB, increased by 17.2 %, with a year-on-year growth declining by 1.5 % points; while the retail sales of rural consumer goods was 2.44 trillion RMB, increased by 16.7 %, with a year-on-year growth increasing by 0.5 % points. Figure 1.3 shows the total retail sales of social consumer goods and the growth rate for 2007–2011.

Specifically, the consumption of various main articles for daily use maintained its growth. The growth rates in retail sales of these categories are as follows: automobile products (14.6 %), cereals and oils (29.1 %), meats, poultry and eggs (27.6 %), clothing (25.1 %), traditional Chinese and western medicines(21.5 %), home appliances and audio-visual equipment (21.6 %), furniture (32.8 %), building

[4] According to the economic development level, the geographical environment and historical continuity, China's territory is grouped into Eastern, Central, Western and Northeastern regions. The Eastern region includes Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan; the Central region covers Shanxi, Anhui, Jiangxi, Henan, Hubei and Hunan; the Western region contains Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang; and the Northeastern region consists of Liaoning, Jilin and Heilongjiang.

[5] In November 2008, to cope with the impact of international financial crisis on China's economy, the Chinese Government proposed an economic stimulus package with a total investment of 4 trillion RMB in 2009 and 2010, with the purpose of boosting China's economic growth. Please refer to pp. 9–10 of the 2011 edition of the report (Binglian Liu et al. "Contemporary Logistics in China: An Introduction," World Scientific Publisher, Singapore, 2011) for detailed information.

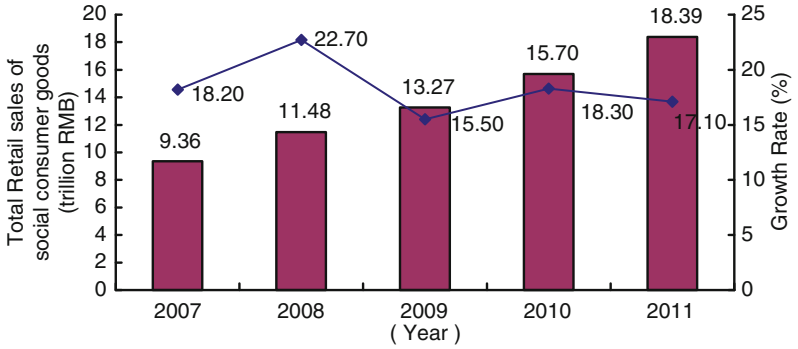

Fig. 1.3 Total retail sales of consumer goods and growth rate for 2007–2011 (Source: Compiled from the *2007–2011 China Statistical Bulletin of National Economic and Social Development*, published by the National Bureau of Statistics of China)

and decoration materials (30.1 %). In 2011, China continued to implement the economic stimulus plan of "Home Appliance to the Countryside",[6] selling more than 103 million units of home appliances and achieving a sales volume of 264.1 billion RMB. The subsidy program of "Old-for-new Home Appliances" sold 92.48 million units of new home appliances in five major categories, inducing a direct consumption of 342.0 billion RMB.

Sustained growth of domestic consumption demand generated a huge demand for logistics. As for the composition of total logistics values, in 2011, the total logistics value for industrial products was 143.6 trillion RMB, with a year-on-year growth of 13.1 % in comparable price; the logistics value for import cargoes was 11.2 trillion RMB, with a year-on-year growth of 4.3 % in comparable price; the total logistics values for agricultural products, renewable resources, and institutions and residents logistics increased by 4.5 %, 20.4 % and 18.3 %, respectively, from the previous year.[7]

1.1.5 Gradual Adjustment of Regional Economic Pattern

China has long exhibited an unbalanced pattern of economic development among its Eastern, Northeastern, Central and Western regions. In recent years, under the impacts of slowing export growth and the rising price of land, capital, labor force

[6] In 2009, the Government subsidized all citizens to buy new home appliances, effectively stimulated the production and sales of home appliances.

[7] In terms of the primary source of domestic products, within certain period, the items entered into logistics field, required logistics service and delivered to final users are mainly divided into the following five categories: (1) total value of agricultural products logistics; (2) total value of industrial products logistics; (3) total value of import cargoes logistics; (4) total value of renewable resources logistics; and (5) total value of institutions and residents logistics.

and other factors, the coastal area in the Eastern Region has been enhancing its economic transformation and structural adjustment; the economic growth in this area has experienced a slowdown. Whereas driven by the "Great Westward Development", the "Northeastern Area Revitalization Plan", the "the Propeller Development of the Central Region," and other regional strategies,[8] the pace of economic growth in the Central and Western regions has been notably accelerated. The economic outputs of the Central, Western and Northeastern regions account for a higher proportion in the nation's total economic output, while that in the Eastern Region shows a downward trend. Table 1.2 shows the regional GDP of the four regions and their proportions in national GDP for 2006–2010.

Along with the re-alignment of the national economic pattern, China's logistics industry also manifested the trend of coordinated development of different regions. The continuing improvements of different regional and inter-regional logistics channels facilitated the gradual enhancement of logistics linkage among different regions. In the Eastern region, the west-straits economic zone in Fujian Province, and the coastland of Jiangsu Province took positive measures in re-coordinating the development of its regional logistics; while in the Central and Western regions, Chengdu, Chongqing, Wuhan, Zhengzhou, and other regional key cities also further strengthened their radiating capacity in logistics. In addition, the connection between inland and coastland was strengthened and a congruent development trend was gradually emerging. For example, through the construction of "dry ports," the connection between coastal ports and inland, the convenience of customs clearance and the transshipment of inland goods were achieved. "Dry ports" were continually expanded in Qingdao, Ningbo, Guangzhou and Tianjin. At the beginning of 2012, Tianjin Port had already developed 21 "dry ports" covering 21 cities in 11 provinces and regions.

1.1.6 Continual Upswing of Production Factor Price

In 2011, China's price level continued to rise steadily. For industrial products, the producer's price index (PPI), the industrial producer's purchasing price and the PPI of capital goods increased respectively by 6.0 %, 9.1 % and 6.6 %; for consumer goods, the CPI throughout 2011 increased by 5.4 %, including the 16.5 % increase of the production price for agricultural products.[9] Figure 1.4 shows the year-on-year growth of monthly CPI and PPI in 2011.

[8] China carried out the strategy of priority development in the eastern coastal area, helping to first develop the Eastern region since 1978. The Great Westward Development move implemented since 1999 has been pushing forward the economic development of the vast Western region. After 2000, china also carried out the "Northeastern Area Revitalization Plan," "the Propeller Development of the Central Region," and other regional strategies.

[9] The production price of agricultural product refers to the price of agricultural product sold by the producer, i.e., the primary sale price of agricultural product.

Table 1.2 Regional GDPs of four major regions and their proportions in National GDP for 2006–2010 (Unit: trillion RMB)

	2006		2007		2008		2009		2010	
Region	Regional GDP	Proportion in GDP (%)	Regional GDP	Proportion in GDP (%)	Regional GDP	Proportion in GDP (%)	Regional GDP	Proportion in GDP (%)	Regional GDP	Proportion in GDP (%)
Eastern	12.92	55.5	15.40	55.1	18.04	54.1	19.67	53.8	23.20	53.1
Central	4.35	18.7	5.30	18.9	6.40	19.2	7.06	19.3	8.61	19.7
Western	4.03	17.3	4.92	17.6	6.04	18.1	6.70	18.3	8.14	18.6
Northeastern	1.98	8.5	2.36	8.4	2.84	8.5	3.11	8.5	3.75	8.6

Source: Compiled from the *China Statistical Yearbook* (2007–2011), published by the National Bureau of Statistics of China

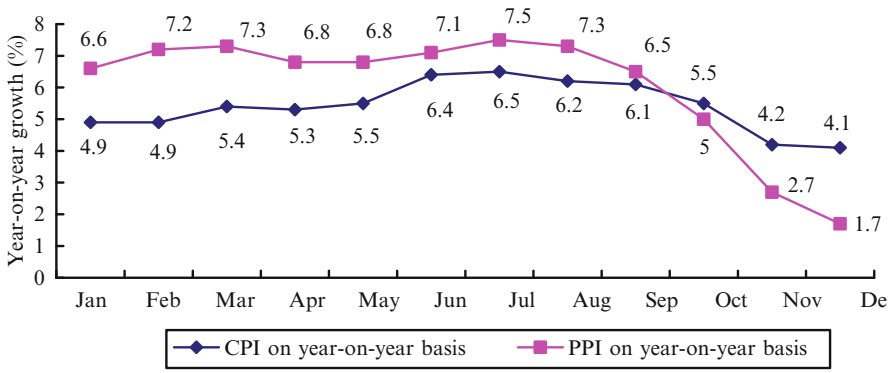

Fig. 1.4 Year-on-year growth of monthly CPI and PPI in 2011 (Source: Compiled from the data published by the National Bureau of Statistics of China. http://finance.people.com.cn/GB/16857974.html)

Owing to the increasing prices of various production factors in China, the logistics industry was impacted with considerable cost pressure in 2011. The first factor is the rising price of product oil throughout the year, which had three price hikes respectively in February, April and October of 2011. The prices of gasoline and diesel fuel increased to 550 RMB and 450 RMB per ton; the price of #93 regular gasolines in Beijing reached a level of 7.61 RMB/l. The second factor is the high labor cost and land cost. The sampling survey by the National Bureau of Statistics shows that the per capita wages of urban residents was 15,412 RMB in 2011, increased by 12.4 % compared to last year. According to the communiqué of the Ministry of Land and Resources, the average leasing cost of land in China was 600 RMB/m^2 in 2008, but it jumped to 926.3 RMB/m^2 in 2010, marking a growth of more than 50 %. The total expenses of social logistics[10] in 2011 accounted for 17.8 % of GDP, equaling to that of 2010, signifying that the logistics industry is still operating at high costs.

1.2 Policy Environment for China's Logistics Development

Every 5 years the Chinese Government issues an economic and social development plan, which focuses mainly on major national construction projects, productivity allocation and the key ratios of the national economy, so as to set goals and directions for the development of the national economy. The year of 2011 marked the beginning year of the *Twelfth Five-Year Plan for National Economic and Social*

[10] The total expenses of social logistics refer to various expenses for external logistics activities in various aspects of the national economy within a certain period.

Development (hereinafter referred to as the "Twelfth Five-Year" Plan). This Five-Year Plan stipulated and affirmed the general tenets of the national development and the key operating issues, including the directives to vigorously develop a modern logistics industry for the upcoming period. The Central and local governments also published a number of industry-specific plans and regional development plans. Furthermore, considering the outstanding problems confronting logistics development, China timely issued the *Opinions of the General Office of the State Council on the Policies and Measures for Promoting the Sound Development of the Logistics Industry* (hereinafter referred to as the "Opinions"), providing an encouraging impetus to the sound development of China's logistics industry.

1.2.1 The "Twelfth Five-Year" Plan

In March 2011, China officially promulgated the "Twelfth Five-Year" Plan, ascertaining the general context of its national economic development. The content in the Plan which relates to China's logistics development includes the following aspects: (1) establishing socialized, professional and informationalized logistics service systems; (2) strengthening the construction of and connection among logistics infrastructures; (3) pushing forward the logistics development in agricultural products, bulk minerals, major industrial products and other key fields; and (4) optimizing the regional structure for logistics development and improving the level of logistics intelligence and standardization. These aspects embody the key fields of China's logistics development for the next 5 years.

In addition, the Plan proposed to build up a comprehensive traffic and transport system, improve the overall level of informatization, actively develop electronic commerce, vigorously expand professional logistics for grains, business, foreign trade and military affairs. It also called for an overall plot to facilitate the transformation and upgrading of the logistics industry, as well as its scientific development, and deployed the main contents and key tasks for the transformation and upgrading of the logistics industry.

1.2.2 Policies on Logistics Industry in the "Nine Guidelines"

The State Council promulgated the *Opinions on the Policies and Measures for Promoting the Sound Development of the Logistics Industry* (hereafter referred to as the "National Nine Guidelines") in August 2011, which listed the States' guiding opinions in nine aspects: taxation, land resources, highway toll charges, logistics management system, integration of industrial resources, technological innovation and application, funding support, agricultural product logistics and organizational coordination. The "Nine Guidelines" is another national-level special policy for macro-steering China's logistics development. Its promulgation and implementation

will not only reduce the burden of logistics enterprises and total social logistic costs, but also bring forth important effect in improving the operating efficiency of the national economy.

After the promulgation and enactment of the "Nine Guidelines," governments of various levels actively followed up and took action with a series of measures.[11] For example: (1) beginning from January 2012, the State Council stipulated that, on a trial basis, the business taxes in traffic and transport industry and certain modern service industries in Shanghai be changed to VAT; (2) on January 20th, 2012, the Ministry of Finance and State Taxation Administration adjusted the tax policy to halve the usage tax of storage facilities on land self-owned by the logistics enterprise; and (3) the Department of Transport (June 2011) carried out several investigative and corrective tasks on traffic and transport charges to assuage unreasonable transport charges and arbitrary fines. By the end of 2011, 18 provinces and regions had abolished certain highway tolls and eliminated 1892 toll stations. These measures have effectively lightened the tax burden of logistics enterprises, regulated the order of logistics market, and thereby exerted a positive effect on relieving the enterprises' cost pressure.

1.2.3 Specific Local "Twelfth Five-Year" Logistics Plans

Since the instatement of the national "Twelfth Five-Year" Plan, Beijing, Tianjin, Zhejiang and some other provinces and cities have successively issued local "Twelfth Five-Year" logistics plans. These local development plans are in line with the general national stipulations, tying in the local economic development characteristics, to put forward the specific goals, ideas and major tasks for the regional logistics industrial development. Beijing's logistics industrial development plan during the "Twelfth Five-Year" period proposes to attract large logistics enterprises to headquarter in Beijing, taking advantage of the Capital's economic territory, and to expand local logistics service functions. The logistics development plan in Hunan Province aims to take advantages of its geographical location in the Central Region and its agriculture industry to develop business logistics, multimodal transport, cold chain logistics, grain logistics and agricultural product logistics. The logistics development plan of Zhejiang Province focuses on boosting its harbor logistics, business logistics and integrated transportation, in view of the advantages attributed to its marine economic development demonstration pilot project and the Yiwu international trade comprehensive reform pilot project.

The enactment of these plans will undoubtedly afford a guiding post in facilitating the transformation and upgrading of local logistics industry, actualizing their regional traits, and strengthening their coordination capability with related industries.

[11] Please refer to Chap. 4 for more details concerning the Nine Guidelines for the logistics industry.

1.2.4 Industrial Plans and Policies

In 2011, the Government issued a number of specific plans for many industries including trade and commerce, postal service, traffic and transportation, medicine, and service trade. The intents of these plans are to guide the direction of industrial development, regulate the industrial supervision and administration, promote the transformation and upgrade of industries, and meanwhile put forward specific requirements for the logistics development in these industries.

For instance, in March 2011, the Ministry of Commerce, the National Development and Reform Commission (NDRC) and the All-China Federation of Supply and Marketing Cooperatives (ACFSMC) jointly issued the *Special Plans on the Development of Trade and Logistics.* The plan proposed to develop the joint distribution of commodities in supermarket chains and promote the construction of inter-regional distribution network for bulk commodities such as industrial products, agricultural products, and production materials.

In July 2011, the State Post Bureau promulgated and implemented the *Twelfth Five-Year Plan for Postal Service* and successively issued a series of specific strategies to normalize the logistics market operations of postal service and express delivery in regard to safety management, merger and acquisition, and business operations.

In April 2011, the Ministry of Transport issued the *Twelfth Five-Year Plan for Traffic and Transport Service*, further stipulating the tenet for logistics development in the transportation industry, addressing aspects in regard to energy saving, emission reduction, and technological advancement. Meanwhile, it also promulgated a number of transportation plans to further normalize the industrial development in the above-mentioned spheres.

In May 2011, the Ministry of Commerce promulgated the *Outline for Development Program of National Pharmaceutics Circulation Industry*, proposing to propel modern medicine logistics development through informatization, to transform the traditional mode of medicine logistics via modern technological means, and thus spearheading the development for professionalized medicine logistics.

1.2.5 Regional Plans and Policies

In 2011, to continue narrowing the gaps in regional economic development and encouraging regional integration and inter-regional cooperation, China issued several regional development plans, such as the *Plan for the Demonstration Zone of Ocean Economic Development of Zhejiang,* the *Regional Planning for Chengdu-Chongqing Economic Zone,* the *Guiding Opinions on Supporting and Accelerating the Construction of the Central Plains Economic Region in Henan,* and the *Planning on Accelerating the Development of Coastal Areas in Hebei.* These plans put forward the overall goals and key tasks for regional economic development, and provided

guidance for regional logistics industrial development as well. Logistics-related contents in these plans can be divided into two categories:

Category 1 is the establishment of regional logistics hubs. For instance, the State Council issued the *Guiding Opinions on Supporting and Accelerating the Construction of the Central Plains Economic Region in Henan* in September 2011, proposing to build up Henan Province into an important modern integrated transportation hub and logistics center in China. In February 2011, the State Council approved the *Plan for the Demonstration Zone of Ocean Economic Development of Zhejiang* and then instituted the Zhejiang Zhoushan Islands District, proposing to establish a transnational logistics base for bulk commodities by taking advantages of the Zhoushan Islands and their deep-water shorelines.

Category 2 is the construction of inter-regional transport channels. In June 2011, the State Council approved the *General Plan on the Construction of the Eastern, Central and Western Regional Cooperation Demonstration Zone,* supporting Lianyungang City of Jiangsu Province to build a regional cooperation demonstration zone linking the Eastern, Central and Western regions, to provide the New Asia-Eurasian Continental Bridge a convenient access to the sea, and to promote the rational flow and optimal allocation of inter-regional resources. In May 2011, the State Council issued The *Opinion on Supporting Yunnan Province to Accelerate the Construction of Vital Bridgehead Open to Southwest China*, proposing to accelerate the pace of building Yunnan into such an important bridgehead and to construct an international land passage to Southeast Asia and South Asia.

1.2.6 Policies on Energy Conservation and Emission Reduction

In 2011, the Chinese Government employed various types of policies to transform its economy to a resource-conserving and environmentally-friendly growth pattern, and enhance the nation's sustainable development capacity. In them, the transportation industry related to logistics was deemed as the key industry for energy conservation and emission reduction.

First, China has adopted taxation and other specific policy measures to encourage energy conservation and emission reduction. In November 2011, the State Council promulgated the *Regulations on implementing the Vehicle and Vessel Tax Law of the People's Republic of China*, stipulating a progressive taxation structure based on the volume of vehicle exhaust, or on the tonnage of the vessel. The Regulations offered preferential treatment in the form of tax exemption or halving the vehicle/vessel tax, for new models of vehicles and vessels that are energy efficient or use new energy.

Secondly, China has utilized special funds to support energy conservation and emissions reduction. In June 2011, the Ministry of Finance and the National

Development and Reform Commission issued the *Notice on Issuing the Administrative Measures for the Financial Incentive Funds for Energy Conservation Technology Retrofits*. The Ministry of Finance and the Ministry of Transport jointly issued the *Notice on Issuing the Interim Measures for the Management of Special Funds for Energy Conversation and Emissions Reductions in the Transportation Industry*. The special funds were mainly used to reward the practices of energy conservation and emissions reduction in logistics-related industries, such as encouraging the technological innovation and project implementation in energy conservation and emissions reduction.

Finally, China has also set up demonstration cities to promote energy conservation and emissions reduction. In June 2011, the Ministry of Finance and the National Development and Reform Commission jointly issued the *Notice on Developing Comprehensive Financial Policy for Energy Conservation and Emission Reduction Demonstration Task* and formulated the *Guiding Opinions on Comprehensive Demonstration Policies for Energy Conservation and Emission Reduction*. Related policies have been demonstrated in Beijing, Shenzhen, Chongqing, and Hangzhou.

1.3 Summary

This Chapter describes the economic conditions and policy settings as the macro environment encountered by China's logistics development in 2011. As for the economic conditions, under the lingering impact of international financial crisis in 2011, China accelerated the transformation of its economic development pattern, further exerted the pulling effect of investments and consumptions upon national economy, and thus was able to maintain a steady and rapid development of its economy. The international trade, fixed asset investment and domestic consumption all maintained an increasing trend but at a declining growth rate. Meanwhile, China has gradually adjusted its regional economic pattern and accelerated the economic development in the Central and Western regions. Affected by the overall price increase, a variety of production factor prices in logistics industry went up and thus heightened the cost pressures of the logistics enterprises accordingly.

Regarding the policy settings, China published the "Twelfth Five-Year" Plan in 2011, providing the general framework for the logistics industry's development in the next 5 years. Meanwhile, China also promulgated and implemented the Nine Guidelines for the logistics industry, pushing forward measures to deal with the nine serious problems in, and to promote the sound development of its logistics industry. Local governments of different levels also issued various industrial and regional plans and policies, stipulating the development emphasis and views related to industrial and regional logistics, and stating the requirements for professionalized development and addressing the distinct features of regional logistics development. In addition, the Government also formulated a number of policies for energy conservation and emission reduction in 2011, to promote the transformation of its economic development pattern in diverse ways.

Chapter 2
Development of China's Logistics Market

Xiaomei Jiang

In 2011, the overall size of China's logistics market continued to grow, yet the growth status of the domestic and foreign trade logistics market is very different, and so is that of the Eastern and Western region's market. Merger and acquisition activities in logistics industry remained active, and domestic logistics enterprises were confronted with significant rise in operating cost and thinning in profits.

This chapter includes three sections. The first section focuses on the changes in logistics indicators like total value and total expense of social logistics in 2011 in comparison with the previous year. This section also provides statistical data regarding these indicators between 2007 and 2010, so as to show the variation trend of the overall size of China's logistics market in recent years. The second section discusses the distinctive features of China's logistics market development in 2011. The third section offers an outlook for China's logistics development trend in 2012.

2.1 Overall Size of China's Logistics Market

In 2011, despite the weak recovery for the world economy, China's logistics market achieved a rather swift growth on the whole with the growth rate of major logistics indicators reaching double digits, due to the robust growth of its domestic economy as well as the impetus of a series of policies and measures taken by the governments at all levels.

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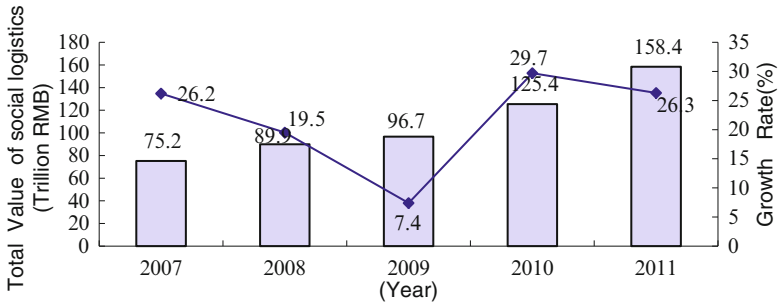

Fig. 2.1 Total value and growth rate of social logistics for 2007–2011 (Source: Compiled from the *National Logistics Operation Report* (2007–2011), published by the National Development and Reform Commission, and data from the National Bureau of Statistics of China, and the China Federation of Logistics and Purchasing)

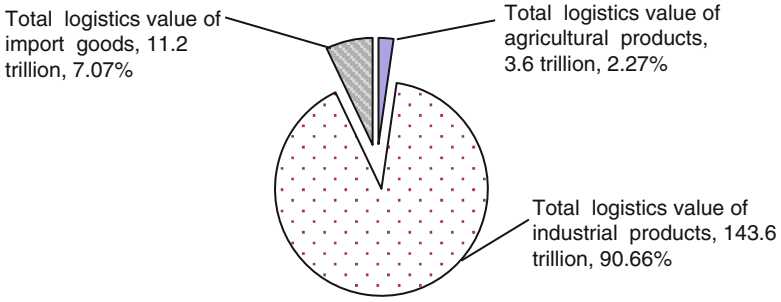

Fig. 2.2 Composition of total value of social logistics in 2011 (Source: Compiled from the *2011 National Logistics Operation Report*, published by the National Development and Reform Commission, and data from the National Bureau of Statistics of China, and the China Federation of Logistics and Purchasing)

2.1.1 Total Value of Social Logistics

The total value of social logistics in China in 2011 reached 158.4 trillion RMB, which increased by 26.3 % year-on-year. Figure 2.1 shows the total value and the growth rate of social logistics for 2007–2011.

Figure 2.2 shows the composition of total value of social logistics[1] in 2011. The share of China's industrial product logistics in total value of social logistics

[1] Total value of social logistics is composed of five parts: (1) total value of commodities of farming, forestry, animal husbandry and fishing products in social logistics field (total logistics amount of agricultural products for short); (2) total value of commodities of industrial products in social logistics field (total logistics amount of industrial products for short); (3) total logistics value of import goods; (4) total value of commodities of renewable resources in social logistics field (total logistics amount of renewable resources for short); (5) logistics value of goods from institutions and residents including luggage in railway and air transport, parcels and letters in mailing service, various donations from all sectors of the society and handling, carrying and transportation of goods incurred by moving activities of institutes and residents.

Table 2.1 Total expense of social logistics and growth rate for 2007–2011

Year	Total expense of social logistics (trillion RMB)	Increase from the previous year (%)	Percentage in GDP (%)
2007	4.5	18.2	18.4
2008	5.5	22.2	18.1
2009	6.1	10.9	18.1
2010	7.1	16.4	17.8
2011	8.4	18.3	17.8

Source: Compiled from the *National Logistics Operation Report* (2007–2011), published by the National Development and Reform Commission, and data from the National Bureau of Statistics of China, and the China Federation of Logistics and Purchasing

was 90.66 %, which increased by 0.48 % points compared with the previous year. The share of total logistics value for import goods was 7.07 %, a drop of 0.45 % points from the previous year. The share of total logistics values for agricultural products, renewable resources and goods from institutions and residents was 2.27 %, a drop of 0.03 % points from the previous year.

2.1.2 Total Expense of Social Logistics

In 2011, due to factors such as higher fuel prices and rising costs of raw materials and labor force, the total expense of social logistics[2] swung up to 8.4 trillion RMB, representing an increase of 18.3 % over the previous year. The percentage of overall expense on social logistics in GDP was 17.8 %, which implied that the operating costs of China's logistics still remained at a relatively high level. Table 2.1 shows the total expense of social logistics and growth rate for 2007–2011.

Table 2.2 shows the composition of total expense of social logistics in 2011. It can be seen that storage expense grew at the fastest rate of 22.6 % compared with the previous year.

2.1.3 Added Value of Logistics Industry

In 2011, the nationwide added value of logistics industry was 3.2 trillion RMB, an increase of 18.5 % over the previous year. The shares of nationwide added value of logistics industry in GDP and in added value of service industry were 6.8 % and 15.7 % respectively, both of which showed a slight drop in comparison with those of the previous year. Table 2.3 shows the added value of logistics industry and growth rate for 2007–2011.

[2] Total expense of social logistics refers to all expenditures for social logistics activities in national economy in a given period. It is composed of transportation expense, storage expense and management expense.

Table 2.2 Composition of total expense of social logistics in 2011

Indicator	Value (trillion RMB)	Increase from previous year (%)	Share (%)	Change of shares from previous year (percentage point)
Total expense of social logistics	8.4	18.5	—	—
In the expense: transportation expense	4.4	15.9	52.8	−1.2
Storage expense	2.9	22.6	35.0	1.1
Management expense	1.0	18.7	12.2	0.1

Source: Compiled from the *2011 National Logistics Operation Report* published by the National Development and Reform Commission, and data from the National Bureau of Statistics of China, and the China Federation of Logistics and Purchasing

Note: Due to rounding, the sum of transportation expense, storage expense and management expense is slightly different from the total expense of social logistics

Table 2.3 Nationwide added value of logistics industry and growth rate for 2007–2011

Year	Added value of logistics industry (trillion RMB)	Increase from the previous year (%)	Share in service industry (%)
2007	1.7	20.3	17.6
2008	2.0	17.6	16.5
2009	2.3	15.0	16.1
2010	2.7	17.4	16.0
2011	3.2	18.5	15.7

Source: Compiled from the *National Logistics Operation Report* (2007–2011), published by the National Development and Reform Commission, and data from the National Bureau of Statistics of China, and the China Federation of Logistics and Purchasing

2.1.4 Freight Volume and Freight Turnover

The total freight volume of China in 2011 was 36.85 giga-tons, which increased by 13.7 % compared with the previous year; the freight turnover was 15.9 trillion ton-kilometers, with an increase of 12.1 % over the previous year. Table 2.4 shows the nationwide freight volume and freight turnover for 2007–2011.

On the freight volume and freight turnover for various modes of transportation, except for a decline in civil aviation, the volumes of other four transportation modes all had an increase of varying degrees; among them the freight volume by highway transportation increased notably faster (at 14.9 %) than those of railway and water-way transport. Table 2.5 shows the freight volume, freight turnover and growth rate of various transportation modes in 2011.

Table 2.4 Nationwide freight volume, freight turnover and growth rate for 2007–2011

	Freight volume		Freight turnover	
Year	Value (gigaton)	Growth rate (%)	Value (trillioton-kilometer)	Growth rate (%)
2007	22.76	11.7	10.14	14.2
2008	25.86	13.6	11.03	8.8
2009	28.25	9.2	12.21	10.7
2010	32.41	14.7	14.18	16.1
2011	36.85	13.7	15.90	12.1

Source: Compiled from the *China Statistical Yearbook* (2011) and related data in the *2011 China Statistical Bulletin of National Economic and Social Development,* published by the National Bureau of Statistics of China

Table 2.5 Freight volume, freight turnover and growth rate of various transportation modes in 2011

Indicator	Value	Growth from the previous year (%)	Share (%)	Change of shares from previous year (percentage point)
Total freight volume (gigaton)	36.85	13.7	—	—
Among which: Railway	3.93	8.0	10.7	−0.6
Highway	28.13	14.9	76.3	0.8
Waterway	4.23	11.7	11.5	−0.2
Civil aviation (megaton)	5.53	−1.8	—	—
Pipeline	0.54	9.0	1.5	0
Freight turnover (trillion ton- kilometer)	15.9	12.1	—	—
Among which: Railway	3.0	6.6	18.6	−0.9
Highway	5.1	18.3	32.3	1.7
Waterway	7.5	9.9	47.3	−0.9
Civil aviation (gigaton-kilometer)	17.2	−4.0	—	—
Pipeline	0.3	29.6	1.8	0.2

Source: Compiled from the *2011 China Statistical Bulletin of National Economic and Social Development*, published by the National Bureau of Statistics of China

2.1.5 Cargo Throughput and Container Throughput of Port

In 2011, China's cargo throughput of port reached 10.04 giga-tons, which increased by 12.4 %, year-on-year. The growth rate decreased by 4.2 % points compared with that of 2010. Specifically, the cargo throughput for foreign trade was 2.79 giga-tons, representing an increase of 11.6 % year-on-year, and a drop of growth rate by 3.3 % points. Table 2.6 shows the nationwide cargo throughput of port and growth rate for 2007–2011.

Table 2.6 Nationwide cargo throughput and growth rate of port for 2007–2011

	Nationwide cargo throughput of port		Share of cargo throughput for foreign trade	
Year	Value (gigaton)	Growth rate (%)	Value (gigaton)	Growth rate (%)
2007	6.41	15.1	1.85	14.6
2008	7.02	9.5	1.99	7.6
2009	7.66	9.1	2.18	9.5
2010	8.93	16.6	2.50	14.7
2011	10.04	12.4	2.79	11.6

Source: Compiled from the *Statistical Bulletin of Highway and Waterway Transportation Industry* (2007–2011), published by the Ministry of Transport of China

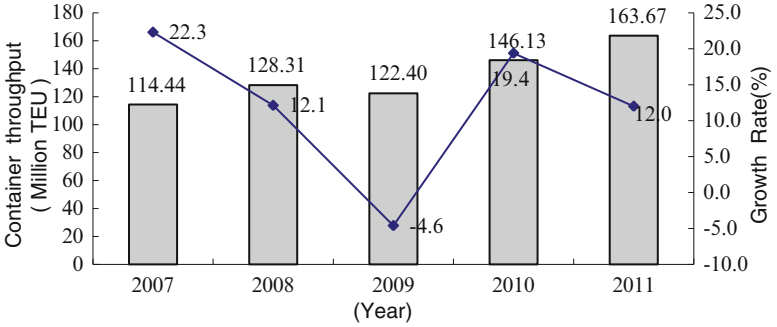

Fig. 2.3 Nationwide container throughput of port and growth rate for 2007–2011 (Source: Compiled from the *Statistical Bulletin of Highway and Waterway Transportation Industry* (2007–2011), published by the Ministry of Transport of China)

As is shown in Fig. 2.3, in 2011, the container throughput of port across the country was 163.67 million TEUs; the growth rate was 12.0 %, which was 7.4 % points lower than that for 2010.

2.1.6 Cargo Transport Volume and Cargo Throughput for Civil Airport

China's market demand for air cargo transport declined somewhat in 2011. The cargo transport volume in domestic aviation industry was 5.53 mega-tons, a decrease of 1.8 % year-on-year, and the growth rate slumped by 28.2 % points compared with that of 2010. Figure 2.4 shows the nationwide civil air cargo transport volume and growth rate for 2007–2011.

Airport cargo throughput across the country for 2011 was 11.58 mega-tons, showing an increase of 2.5 % over the previous year; the growth rate decreased by 16.9 % points compared with that of 2010. Figure 2.5 shows the nationwide airport cargo throughput and growth rate for 2007–2011.

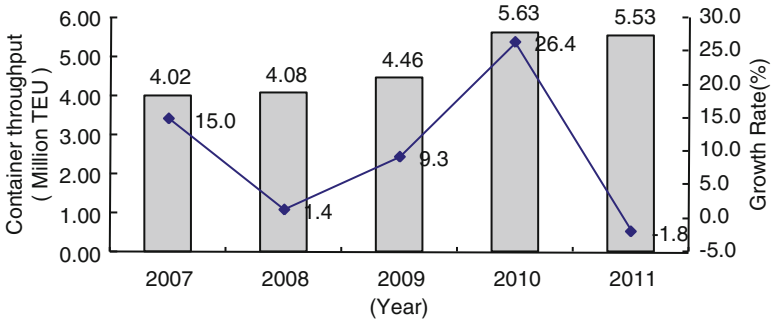

Fig. 2.4 Nationwide civil air cargo transport volume and growth rate for 2007–2011 (Source: Compiled from the *Statistical Bulletin of Development of Civil Aviation (2010–2011)*, published by the Civil Aviation Administration of China)

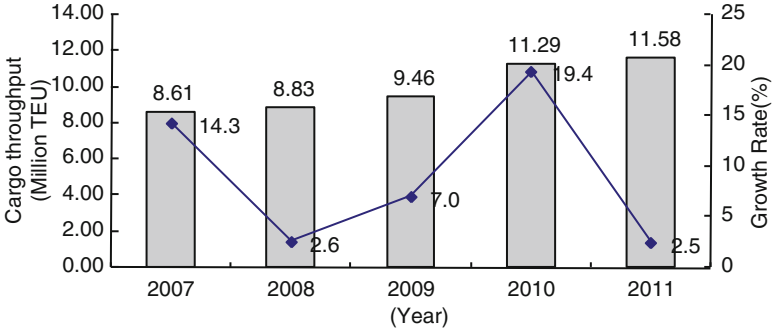

Fig. 2.5 Nationwide airport cargo throughput and growth rate for 2007–2011 (Source: Compiled from the *Statistical Bulletin of Nationwide Airports* (2007–2011), published by the Civil Aviation Administration of China)

2.1.7 Business Volume of Express Industry

In 2011, the volume of express business in China grew swiftly with a growth rate more than double that of the previous year. The business volume of express service enterprises above a designated size[3] was 3.67 billion pieces, a rise of 56.8 % year-on-year, and the growth rate increased by 31.1 % points compared with that of 2010. Figure 2.6 shows the nationwide business volume and the growth rate of express service enterprises above a designated size for 2007–2011.

The volume of out-of-city express business amounted to 74.11 % of the total business volume, increasing by 2.6 % points over the previous year. The Eastern Region contributed approximate 80 % to the total business volume, showing an increase of 0.6 % points from the previous year, as shown in (Table 2.7).

[3] Express service enterprises above a designated size refer to those enterprises with annual business income over two million RMB.

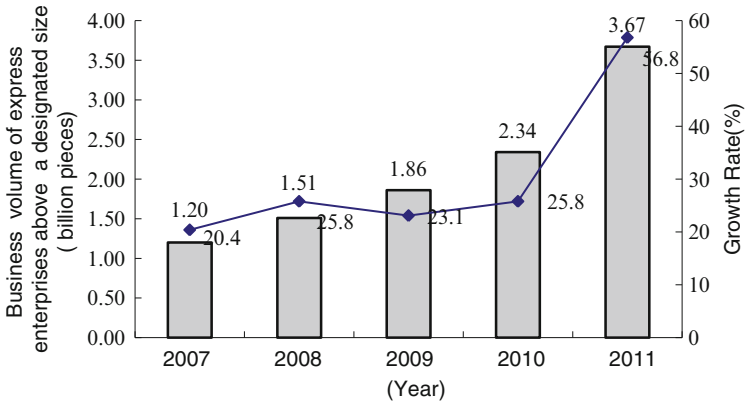

Fig. 2.6 Nationwide business volume and growth rate of express service enterprises above a designated size for 2007–2011 (Source: Compiled from the *Statistical Bulletin of Postal Service Industry (2007–2011)*, published by the State Post Bureau)

Table 2.7 Composition of nationwide express business volume of 2011

Distribution of business categories			Regional distribution		
Business categories	Volume (billion pieces)	Share (%)	Region	Volume (billion pieces)	Share (%)
Within city	0.82	22.34	Eastern	2.93	79.84
Out-of-city	2.72	74.11	Central	0.41	11.17
International and Hongkong, Macao and Taiwan	0.13	3.54	Western	0.33	8.99

Source: Compiled from the *2011 Operation of Postal Service Industry*, published by the State Post Bureau

2.2 Development Features of China's Logistics Market

In 2011, due to factors such as weak international market demand, continuing shifting of domestic demand to the Central and Western regions, fierce market competition, and apparent increase of logistics costs, China's logistics market exhibited some pronounced features as described below.

2.2.1 The Domestic/Foreign Trade Logistics Markets

China's domestic trade cargo throughput of all ports in 2011 was 7.26 giga-tons, a rise of 12.8 % year-on-year, and the growth rate was 1.4 % points higher than the cargo throughput for import and export trade. Table 2.8 shows the cargo throughput and growth rate of port for domestic and foreign trade for 2007–2011.

Table 2.8 Cargo throughput and growth rate of port for domestic/foreign trade for 2007–2011

	Cargo throughput for domestic trade		Cargo throughput for import and export trade	
Year	Volume (gigaton)	Growth rate (%)	Volume (gigaton)	Growth rate (%)
2007	4.56	15.2	1.85	14.9
2008	5.03	10.3	1.99	7.6
2009	5.48	8.9	2.18	9.8
2010	6.43	17.3	2.50	14.7
2011	7.26	12.8	2.79	11.4

Source: Compiled from the *Statistical Bulletin of Highway and Waterway Transportation Industry* (2007–2011), published by the Ministry of Transport of China

Table 2.9 Cargo throughput and growth rate of domestic and international airlines for 2007–2011

	Domestic airlines		International airlines	
Year	Volume (megaton)	Growth rate (%)	Volume (megaton)	Growth rate (%)
2007	5.54	9.9	3.07	23.3
2008	5.64	1.8	3.19	3.9
2009	6.25	10.8	3.21	0.06
2010	7.22	15.5	4.07	26.8
2011	7.50	3.9	4.08	0.02

Source: Compiled from the *Statistical Bulletin of Nationwide Airports* (2007–2011), published by the Civil Aviation Administration of China

Table 2.10 Domestic and international express business volume for 2008–2011

	Within-city and out-of-city		International and Hongkong, Macau and Taiwan	
Year	Volume (billion pieces)	Growth rate (%)	Volume (billion pieces)	Growth rate (%)
2008	1.40	—	0.106	—
2009	1.75	25.0	0.113	6.6
2010	2.21	26.3	0.130	15.0
2011	3.54	60.2	0.128	−1.5

Source: *Compiled from the Operation of Postal Service Industry* (2008–2011), published by the State Post Bureau

The cargo throughput of domestic airlines was 7.50 mega-tons, a growth of 3.9 % year-on -year. There was hardly any increase of cargo throughput for international airlines in 2011. Table 2.9 shows the cargo throughput and growth rate of domestic and international airlines for 2007–2011.

The volume of domestic express delivery achieved a rapid growth rate of 60.2 % in 2011, but the express volume for international and Hong Kong, Macau and Taiwan shrunk by 1.5 %. Table 2.10 shows the domestic and international express business volume for 2008–2011.

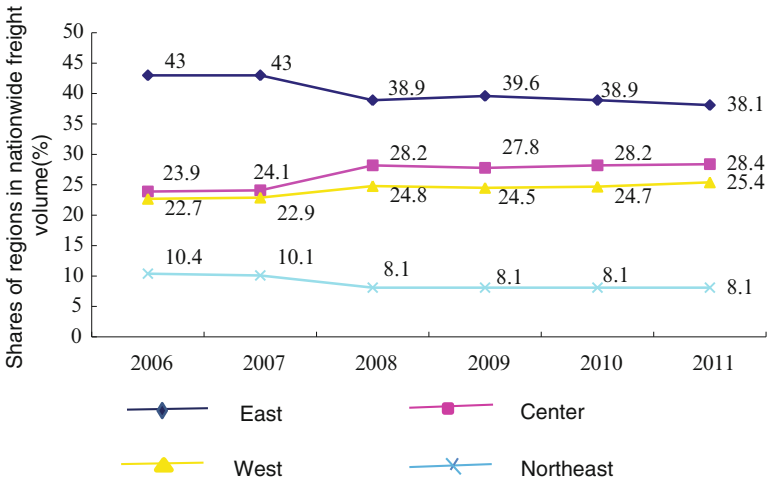

Fig. 2.7 Shares of freight volume of the four regions for 2006–2010 (Source: *Compiled from the China Statistical Yearbook* (2007–2011), published by the National Bureau of Statistics of China)

Table 2.11 Shares of airport cargo throughput of the four regions for 2007–2011

Year	Eastern region	Central region	Western region	Northeastern region
2007	64.5	20.1	11.8	3.6
2008	64.6	19.3	12.3	3.8
2009	62.1	21.7	12.4	3.8
2010	62.1	22.4	11.9	3.6
2011	60.8	22.9	12.6	3.7

Source: Compiled from the *Statistical Bulletin of Nationwide Airports* (2007–2011), published by the Civil Aviation Administration of China

2.2.2 *Continual Growth of Logistics Market for the Central and Western Regions*

Since 2006, the economic growth in the Central and Western China has been surpassing that of the Eastern Region, and so has been the growth of their logistics market.

Between 2006 and 2011, the shares of freight volume for the Central and the Western Regions have been on the rise, causing the share for the Eastern Region to dwindle. Figure 2.7 shows the shares of the four regions in nationwide freight volume for 2006–2011.

In addition to the conspicuous upswing in freight volumes, the shares of the Central Region and the Western Region in nationwide airport cargo throughput also increased from 20.1 % and 11.8 % in 2007 to 22.9 % and 12.6 % in 2011, respectively. By contrast, the share of the Eastern Region declined from 64.5 % in 2007 to 60.8 % in 2011. Table 2.11 shows the shares of airport cargo throughput of the four regions for 2007–2011.

Table 2.12 Construction and planning of logistics systems of some E-commerce enterprises in 2011

No.	Enterprise	Construction of logistics system
1	Alibaba Group	In January, 2011, the group announced a first-phase investment of 20–30 billion RMB for the construction of a nationwide storage network system. The first logistics center project with a total investment of three billion RMB, covering an area of one million square meters, had been launched in 2012
2	306buy	In April 2011, the enterprise consummated the financing of 1.5 billion USD for construction projects in logistics and technology research and development. In 2011, it began the construction of 7 primary distribution centers and 25 secondary distributions centers. In the upcoming 3 years, it plans to invest 5–6 billion RMB in logistics construction, aiming to erect six large-scale regional distribution centers and build a transport fleet of more than 300 trucks
3	Dangdang	From 2010 to 2011, it expanded the number of cities with its distribution centers from 6 to 10, and increased the storage area from 180 thousand square meters to 340 thousand square meters. A distribution service company controlled by Dangdang was established to provide storage, sorting and package service of goods to other e-commerce enterprises and payment collection service in more than 1,200 cities throughout the country
4	VANCL	In 2011, the enterprise launched 5 regional distribution centers and completed site selection for another 10. The number of cities covered by its own-operated logistics company reached 28; terminal sites exceeded 300, with staff of 8,000
5	Mecox Lane	The enterprise started to construct a global operating center covering an area of 140 thousand square meters. Once completed, it would be able to hold 600 thousand SKUs and achieve a maximum number of 130 thousand outgoing orders per day. It also reached an agreement with a number of airlines to launch air transportation in more than 20 cities to speed up its delivery
6	OkBuy	In May, 2011, the enterprise received financing of 60 million USD, most of which was used for the construction of storage facilities. It had built up regional distribution centers in five cities. In October, 2011, it established its own logistics company and realized own-distribution in Beijing, Shanghai, Guangzhou and Chengdu

2.2.3 Construction of Large-Scale Distribution System of E-commerce Enterprises

Since 2000, China's e-commerce market, in particular the online shopping market, has maintained a notable growth; nonetheless, the inadequacy of the capability and level of logistics distribution service of the industry has hampered the development of China's e-commerce. In 2011, a number of large-scale e-commerce enterprises invested heftily in the construction of logistics systems to improve the industry's logistics service capabilities. Table 2.12 shows the construction and planning of logistics systems for some e-commerce enterprises in 2011.

Table 2.13 Statistics of M&A in China's logistics industry from 2010 to the first half of 2011

Business segment	Number of cases	Number of cases disclosing the amount of M&A	Amount of M&A (million USD)	Average amount of M&A (million USD)
Distribution and storage	14	9	68.93	7.66
Logistics management	3	3	585.68	195.23
Others	3	3	77.68	25.89
Total	20	15	732.3	48.82

Source: Data from Zero2IPO Research Center, August, 2011

Table 2.14 Prologis' 2011 Acquisitions in China

Date	Object of acquisition	Content of acquisition	Amount of acquisition
January, 2011	China Harbor Development Co., Ltd. (exclusive developer of airfreight and bonded storage logistics facilities of Beijing Capital International Airport)	53 % equity	375 million USD
August, 2011	Shanghai Yupei (Group) Co., Ltd. (Sino-US joint venture)	49 % equity	53.6 million USD
August, 2011	Realty Vailog (logistics facilities developer from Italy)	90 % equity of Vailog Jiading distribution center and Songjiang logistics park	60.2 million USD
September, 2011	Zhejiang Transfar Logistics Base Co., Ltd. (Chinese private enterprise)	60 % equity	—

2.2.4 Active Logistics Merger and Acquisition Market

From 2010 to the first half of 2011, a total of 20 M&A cases emerged in China's logistics market; of which 15 cases disclosed a total M&A amount of 732.3 million USD. The M&A cases over this period were mainly in the segments of distribution and storage, as well as logistics management. Table 2.13 shows the M&A in China's logistics industry from 2010 to the first half year of 2011.

In addition, in 2011, the logistics real-estate firm Prologis completed four acquisitions in China, which solidified its leading position in China's logistics property market. Table 2.14 shows Prologis' 2011 acquisitions in China.

Table 2.15 Resource integration of China's large-scale state-owned logistics enterprises in 2011

Enterprise	Content and method of resource integration	Purpose of resource integration
China Eastern Airlines Co., Ltd.	Airfreight resource integration Merged three subordinate cargo airlines into one newly-established company	To build up international competitiveness of Eastern Airlines in airfreight field by centralizing freight resources
COSCO Group	Bulk-cargo resource integration Established COSCO Bulk Carrier (Group) Co., Ltd. and infused its subordinate bulk cargo resources into the company	To further optimize the business management framework of COSCO's bulk cargo business and to enhance its competitiveness and anti-risk capability
China shipping development	Bulk-cargo resource integration Infused the business and assets of the Group's dry bulk carriers and oil tankers into two newly established wholly-owned subsidiaries respectively, realizing specialized operation of two business areas	To optimize the company's internal management system and to improve its professional management and business efficiency
Sinotrans & CSC Holdings Co. Ltd.	Integration of comprehensive logistics business Infused companies within the Group which engage in comprehensive logistics businesses into the listed company, or subject them to the trusteeship of listed company. The integrated resources covered 30 regions and over 200 enterprises with an asset size of nearly five billion RMB	To enhance the company's comprehensive logistics business strength and to realize the strategic positioning of the company's integrated logistics enterprises

2.2.5 Internal Resource Integration of Large-Scale State-Owned Logistics Enterprises

In 2011, a number of state-owned enterprises including COSCO and China Shipping Development successively implemented the integration of their internal resources. These enterprises made improvement in business efficiency and market competitiveness through centralizing their advantageous resources. Table 2.15 shows the specifics of these integrations.

2.2.6 Continually Expanding Service Scope of Logistics Enterprises

In 2011, an increasing number of logistics enterprises established deeper cooperation relationship with the manufacturing industry, thereby extending their logistics service scope to both ends of the supply chain. Some logistics enterprises shifted from undertaking small amount of simple logistics outsourcing initially to being fully involved in the manufacturers' supply chains. Moving towards the upstream side of the supply chain, the logistics enterprise provided its manufacturers with various services such as purchasing of raw materials and spare parts, inbound transportation, and warehousing management of raw materials. On the downstream side of the supply chain, it provided its manufacturers with services like distribution processing at the back end of their production line, finished product sales logistics, and after-sales logistics for components and parts. For example, a logistics firm in Shanghai, undertaking logistics outsourcing service for Bayer Material Science, not only provided raw material storage management and inbound delivery service at the front-end of production, but also greatly expanded its value-added service like material mixing and product packaging at the back end of the production line, as well as finished product storage and outbound delivery service. The business scope of this logistics firm has attained full coverage of the entire supply chain for Bayer Material Science.

Moreover, in order to meet the clients' requirements of expanding their products into the entire domestic and overseas markets, some logistics enterprises are seeking to extend their service scope by various means, such as multiplying the network nodes and upgrading the information system. For example, in 2011, Sinotrans strengthened its placement of global network nodes and acquired part of the shares of InterBulk Group—a global logistics solutions supplier of liquid and dry bulk cargo transportation. Shanghai Xinjie Logistics, in order to meet 3 M Company's demand in expanding its market to the third-tier and fourth-tier cities in China, conducted the transformation of its information system and the construction of logistics supporting system, added E-shop service and after-sales support service for the products, and also expanded the offline distribution service across the country.

2.2.7 Amplified Operating Pressure of Logistics Enterprises

In 2011, swayed by the rising oil price, labor cost, land price and taxes, the operating costs of China's logistics enterprises grew incessantly. Yet the operating revenue crept at a slower pace, bringing about added operating pressure for the logistics enterprises.

From January to August, 2011, the main business income and cost of China's key logistics enterprises increased by 29.6 % and 31.4 %, respectively year-on-year; the increase of main business cost was 1.8 % points higher than that of the main

business income.[4] Besides, according to statistics by the China Materials Storage & Transportation Association, for the sample firms of its 60 large-scale members, the main business income of the storage enterprises increased by 16 % while the profits only increased by 12 % compared with those of the previous year.

In 2011, the business volume of China's express service enterprises above a designated size increased by 57.0 %, yet the business income increased by only 31.9 %[5] year- on-year. The profit margin of domestic express companies has dropped from above 30 % years ago to about 5 % in 2011. In 2009, DHL purchased all equities of three Chinese domestic express companies to engage in the express delivery business in China. Up to the end of 2010, the three companies had a cumulated loss of about 99.23 million RMB. In June, 2011, DHL transferred all the equities of these three companies to a Chinese private logistics enterprise (Shenzhen Uni-top Industries Co., Ltd., UNI-TOP GROUP) and exited from China's domestic express market.

2.3 Development Trend of China's Logistics Market

Given the uncertain international economic outlook and China's economic development in the upcoming years, it is expected that the overall size of China's logistics market in 2012 will grow, but at a slower pace. The international logistics market will be expanded further and the construction of distribution logistics system will be accelerated. The implementation of a series of supportive government policies for the logistics industry is expected to alleviate the cost pressure of logistics enterprises.

2.3.1 Continuously Declining Growth Rate of Logistics Market

Facing the various uncertainties in the process of global economic recovery, the economic growth rates of both advanced and emerging economies are likely to decrease further in 2012. Meanwhile, the Chinese Government will move forward in strengthening its economic restructuring. In view of the dual effect of the external economic slowdown and China's internal economic restructuring, it is anticipated that the overall size of China's logistics market will keep on growing, but the pace of growth will likely to subside.

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[4] *Logistics Operation Analysis of the First Three-quarters of 2011*, published by the China Federation of Logistics and Purchasing. http://www.chinawuliu.com.cn/lhhkx/201110/21/173501.shtml.

[5] *Operation of Postal Industry (2011)*, published by the State Post Bureau. http://www.spb.gov.cn/folder87/2012/01/2012-01-20100943.html.

2.3.2 More Diversified Scope of International Logistics Market

Between 2012 and 2015, China will continue to promote the trade diversification strategy and put the emphasis on developing the 30 emerging global markets. These markets are widely distributed in Asia, Europe, Africa and America, as well as in countries like Russia, India and South Africa, featured with abundant resources, large population and important strategic position. With continuous pursuit of the trade diversification strategy, the scope of China's future international logistics market will be further expanded and the direction of international logistics flows will be more diversified. The contribution of main economies like Europe and America to the growth of China's international logistics market is likely to diminish. While emerging economies such as India, Brazil and Russia, together with the key areas which in recent years garner China's foreign investment, foreign construction project and foreign aids like Australia, Saudi Arabia and UAE, are expected to become the highlights in promoting the development of China's international logistics markets.

2.3.3 Rapidly Growing Distribution Logistics System

Confronted with insufficient demand from abroad and increasingly growing domestic consumption power, the Chinese Government has focused its effort on expanding the consumers demand in the "Twelfth Five-Year Plan" (2011–2015). Hence, it can be expected that more attention will be paid to logistics systems construction in the distribution fields, and the pace of construction will be sped up. In particular, the construction of essential and specialized logistics systems in fields like e-commerce, agricultural product, food cold chain and medicine logistics will take the lead in the accelerated startup moves.

2.3.4 Policy Support for Logistics Industry

In 2012, China began implementing a series of policy measures aimed at alleviating the cost burden of logistics enterprises. In January, 2012, the transportation business in Shanghai was chosen as a pilot industry to test the policy of collecting value-added tax in lieu of business tax; in addition, preferential policy of halving the land use tax for the land use by bulk stock storage facilities of logistics enterprises also came into effect. The special cleanup task for toll highways, conducted in concert by the Ministry of Transport and the National Development and Reform Commission, is estimated to finish in 2012. Problems on highway tolls such as charging tolls beyond pre-set timeframe, excessive toll charge standards and unreasonable toll collection on highways will be dealt with. By these measures, the future cost pressure of logistics enterprises is expected to be alleviated to some extent.

2.4 Summary

This chapter depicts the overall development scale and features of China's logistics market in 2011. Regarding the overall scale, in spite of the unfavorable external economic environment, China's logistics market, propelled by the steady domestic economic growth and a series of policy measures by the governments at all levels, still achieved a relatively rapid growth; the growth rates of all major logistics indicators reached double digits. For the development features, in various segmented markets, domestic trade logistics market had better performance than import and export trade logistics market. The growth rates of logistics market in the Central and Western Regions were higher than that in the Eastern Region, and the continuous swift growth of e-commerce market prompted large-scale e-commerce enterprises and express industries to invest large sum of money into the construction of distribution networks. M&A activities remained active in the logistics industry. Some large-scale state-owned logistics enterprises actively conducted integration of their internal resources. The service level of domestic logistics enterprises continued to improve. In the meantime, the operating cost in logistics industry in 2011 experienced a marked increase and the profit margin met obvious decline. Based on an overall assessment of the internal and external environments for China's logistics development for 2012, it is expected that China's logistics market will grow at a much slower pace. The scope of international logistics market will be more diversified, and the distribution logistics system will show a rapid development. In addition, the implementation of a series of preferential tax policies tailored for the logistics industry will, to a certain extent, alleviate the cost pressure of the logistics enterprises in the coming years.

Chapter 3
Logistics Facilities and Technological Development

Fan Qin

In 2011, China continued its endeavor in strengthening the construction of integrated transport system. Notably many logistics nodal cities in China pushed forward the construction of logistics parks in an orderly manner; logistics parks (centers) for agricultural cold chains and commercial trade were built in a markedly accelerated manner. Over-all capacity of logistics channels was further enhanced and logistics equipment in use was gradually moving towards the direction of low carbon and automation.

This chapter presents the logistics facilities and technological development in China in 2011 from four aspects: construction of transportation infrastructure, construction of logistics parks and storage facilities, logistics equipment, and logistics informatization and standardization. Section 3.1 analyzes and summarizes the infrastructure construction of highway, railway, water transport and aviation, and discusses the advancement in transportation channel construction from the perspective of integrated transport system. Section 3.2 analyzes the development characteristics of logistics park (center) construction and storage facilities construction in China in 2011. Section 3.3 states the characteristics of production and demand of logistics equipment such as vehicles and storage equipment. Section 3.4 describes the major events and progresses due to the recent actions taken in logistics informatization and standardization.

3.1 Status of Transport Infrastructure Construction

In 2011, the first year of the "Twelfth Five-year Plan" (2011–2015) period, new progress was made in integrated transport system construction in China. The infrastructure of highway, waterway, civil aviation and postal service was continually augmented; construction of international freight channels was developed rapidly

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and the demonstration project of container railway-waterway combined transportation was carried out with good pace.

3.1.1 Highway Infrastructure

3.1.1.1 Expanded Highway Network

China finished the highway construction investment of 1.26 trillion RMB in 2011, showing a year-on-year growth of 9.7 %. By the end of 2011, the total highway mileage in China had reached 4.11 million kilometers, a year-on-year increase of 98,200 km; highway density had reached 42.77 km/hundred km^2, up by 1.02 km/hundred km[1] year-on-year.

3.1.1.2 Continually Improved Highway Network

In 2011, the proportion of graded highways in total highway mileage-wise continued to rise. Therein, the proportion of grade-II-and above highways increased rapidly, reaching 11.5 % of the total highway mileage, showing a year-on-year growth of 0.4 percentage points, and the most rapid increase since 2008. Expressway construction also witnessed a rapid progress and accomplished an investment of 742.41 billion RMB, up by 8.2 % year-on-year. By the end of 2011, expressways in China had reached 84,900 km, showing an increase of 10,800 km, the most increase in expressway mileage since 2006. There are presently14 provinces with expressways exceeding 3,000 km.[2]

3.1.1.3 Rural Highway Construction in the Western Region

In 2011, rural highway construction in China received investment of 201.01 billion RMB, up by 4.5 % over the previous year; new and rebuilt rural highways amounted to 187,500 km.[3] Therein, the Government boosted the investment in rural highways in the West considerably, marking 2011 the year with most rapid progress of rural highway construction in the West. The rapid development of rural highway construction in the West would undoubtedly enhance the logistics capacity and efficiency in the area, thus improving the logistics development in the Western Region.

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[1] The *Statistical Bulletin of Highways and Waterway Transportation Industry Development (2011)*, published by the Ministry of Transport of P.R.C., Beijing, 2012-4-25.

[2] Ibid.

[3] Ibid.

Table 3.1 Growth of railroad lines in service for 2006–2011

	2006	2007	2008	2009	2010	2011
Total length of railway lines (thousand km)	77	78	80	86	91	93
Newly increased length of railway lines (thousand km)	1.68	0.88	1.72	5.8	5.66	2.07

Source: Compiled from the *Railway Statistics Bulletin* (2005–2011) published by the Ministry of Railways of China, and the *China Statistics Yearbook* (2005–2011) published by the National Bureau of Statistics of China

3.1.2 Railway Infrastructure

3.1.2.1 Reduced Fixed Asset Investment

As the economic stimulus packages promoted by the Government at the end of 2008 gradually receded in 2011, fixed asset investment in railway for the year was decreased noticeably with a total amount of 586.31 billion RMB, down by 30.1 % year-on-year. Therein, the investment in infrastructure was 461.08 billion RMB, showing a decrease of 34.8 %.[4] As reported in the Railway Statistics Bulletin (2011), in 2011, there were totally 310 large railway network projects in China with investment of 700.533 billion RMB, showing a decrease of 241.12 billion RMB and a drop of 34.3 % over the previous year.[5]

3.1.2.2 Continually Upgraded Railway Network Structure

In 2011, China continued to expand the scale of railway network, increasing the length of railroad lines in service by 2,071.1 km. The total length in service was 93,000 km, ranking second in the world. The railway network density achieved 97.1 km/10,000 km^2, showing a year-on-year growth of 2.1 km/10,000 km^2. Table 3.1 shows the growth of railroad lines in service during 2006–2011.

In 2011, China continued to optimize the railway network structure. The length of newly increased multitrack railways was 2,012.5 km, raising the overall proportion of multitrack railway to 42.4 %, showing a year-on-year increase of 1.3 percentage points; the length of newly increased electrified railways was 3,599.7 km with the overall electrification rate of 49.4 %, showing a yearly increase of 2.8 percentage points.[6]

[4] *Completion of National Key Railway Index in 2011*, the Ministry of Railways of China, 2012-2-15. http://www.china-mor.gov.cn/zwzc/tjxx/zyzb/201202/t20120215_29645.html.

[5] *Railway Statistics Bulletin (2011)*, published by the Ministry of Railways of China, 2012-4-19.

[6] *Railway Statistics Bulletin (2011)*, published by the Ministry of Railways of China, Beijing, 2012-4-19.

3.1.2.3 Construction of the Channel for International Railway Freight

The construction of the grand channel for international railway freight made substantial progress in 2011. The "Chongqing-Xinjiang-Europe" International Railway Combined Transportation Channel[7] was put into operation in April, which enabled Chongqing to become an important collection/disbursement center for exporting to Europe. In December 2011, China held a railway linking ceremony with Kazakhstan at Khorgas Port of Xinjiang, which symbolized the formal opening of the second China-KZ grand channel of international railway. Optimal combination between long-distance cross-border railway and existing domestic railway lines is beneficial for achieving railway integration and combined transport between China and its neighboring countries. It will also improve the land transport efficiency of China's international logistics and drive the development of foreign trade and logistics for its inland provinces.

3.1.3 Waterway Infrastructure

3.1.3.1 Rapidly Expanded Infrastructure Scale

Investment of waterway construction in China was substantially increased in 2011, with investment in inland-river and coastal construction of 140.49 billion RMB, up by 19.9 % over the previous year. Therein, coastal construction investment was 100.70 billion RMB, showing an increase of 20.3 %; inland-river construction investment was 39.79 billion RMB, showing an increase of 18.9 %.[8] The growth of waterway construction investment in China for 2006–2011 is illustrated in Fig. 3.1.

Along with sizable increase of waterway construction investment in recent years, the scale of waterway infrastructure in China was expanded rapidly in 2011. The number of new and rebuilt (expanded) quay berths at coastal ports rose to 440 with added throughput of 213.93 million tons. The number of new and rebuilt (expanded) quay berths at inland ports was 209, with increased throughput of 84.18 million tons.[9] By the end of 2011, China had 31,970 production quay berths at ports, 370 km of newly increased inland waterway mileage, and 124,600 km of total length of inland waterway in service.[10] Growth of port throughput in China for 2006–2011 is shown in Table 3.2.

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[7] The Chongqing-Xinjiang-Europe International Railway starts from Chongqing, passes through Xi'an, Lanzhou, Urumchi, etc., then reaches the border at Alataw Pass and arrives at Duisburg of Germany through Russia, The Republic of Belarus and Poland, with a total length of 10,003 km and a transport duration of about 16 days. It is the strategic channel for Chongqing to speedily transport laptops, mechanical & electrical products and auto spare parts to Europe.

[8] *Statistical Bulletin of Highway and Waterway Transportation Industry (2011)*, published by the Ministry of Transport of China, Beijing, 2012-4-25.

[9] The *Statistical Bulletin of Highway and Waterway Transportation Industry (2011)*, published by the Ministry of Transport of China, Beijing, 2012-4-25.

[10] Ibid.

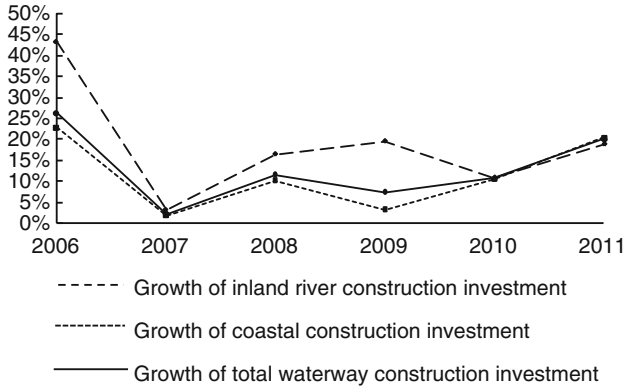

Fig. 3.1 Growth of waterway construction investment in China for 2006–2011 (Source: Compiled from the *Statistical Bulletin of Highways and Waterway Transportation Industry Development* (2006–2011), published by the Ministry of Transport of China)

Table 3.2 Growth of port throughput in China for 2006–2011

	2006	2007	2008	2009	2010	2011
Newly added throughput of coastal port (million tons)	361.48	324.29	321.75	338.58	213.93	245.85
Newly added throughput of inland port (million tons)	78.70	75.60	73.36	104.72	97.67	84.18
Total	440.18	399.89	395.11	443.30	311.60	330.03

Source: Compiled from the *Statistical Bulletin of Highway and Waterway Transportation Industry* (2006–2011), published by the Ministry of Transport of China

Large Quay Berth

In 2011, China's quay berth kept developing toward larger size. By the end of 2011, there were 1,762 berths of 10 k-tons or above at ports, showing a year-on-year increase of 101 in number. Therein, the newly added throughput of inland berths of 10 k-tons or above was 39.86 million tons, the largest increase since 2006, as shown in Fig. 3.2.

Proportion of High-Grade Waterway Elevated

During the "Twelfth Five-Year Plan" period, the construction of high-grade inland waterway[11] was formally launched in 2011. While the mileage of inland waterway in

[11] It refers to a plan of improving the level of national inland channels proposed by the Ministry of Transport of P.R.C. Main contents: within 5 years beginning in 2011, China will invest 200 billion RMB to improve the overall level of the channels of Yangtze River Main Line, Xijiang Shipping Main Line, Beijing-Hangzhou Canal, Yangtze River Delta Water System, Pearl River Delta Water

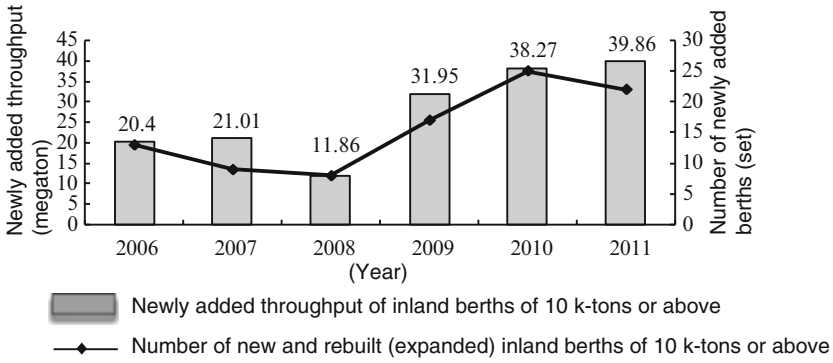

Fig. 3.2 Throughput growth of Inland Berths above 10 K-tons in China for 2006–2011 (Source: Compiled from the *Statistical Bulletin of Highway and Waterway Transportation Industry* (2006–2011), published by the Ministry of Transport of China)

service continued to increase in 2011, the proportion of high-grade waterway in China was also raised. In the same year, the mileage of graded waterway reached 62,600 km and amounted to 50.3 % of the total mileage, showing a year-on-year growth of 0.2 percentage points. Therein, waterway of grade III or above was 9,460 km, which equals to 7.6 % of the total mileage and an increase of 0.1 percentage points.[12]

3.1.4 Advances in Civil Aviation Infrastructure Construction

3.1.4.1 Expanded Scale of Civil Aviation Infrastructure

In 2011, civil aviation completed investment of 68.77 billion RMB in infrastructure and technical transformation, showing a year-on-year increase of 6.4 %. The scale of civil aviation infrastructure continued to expand, with five newly certified freight airports, increasing the total number to 180 for the whole nation.[13]

3.1.4.2 Accelerated Construction of Airport Facilities in the Western Region

The five newly opened civil aviation airports in 2011 were all located in the Western Region, adding up to a total of 94 airports for the Region, which accounted for 50 %

System and other 18 main lines and branches, so as to form a high-grade channel network composed mainly of channels with capacity to accommodate ships of thousand-tons–and-above.

[12] *Statistical Bulletin of Highway and Waterway Transportation Industry (2011)*, published by the Ministry of Transport of China, 2012-4-25.

[13] *Statistical Bulletin of Nationwide Airports (2011)*, published by the Civil Aviation Administration of China, 2012-03-21.

of the country's total.[14] Such a high scale affords a solid infrastructural assurance for the airfreight development in the Western Region.

3.1.5 Transportation Channels

In accordance with the requirements of the *Mid- and Long-Term Development Plan of Multi-modal Transport Network* issued by the NDRC in November 2007, the construction of integrated transportation channels was carried out steadily in 2011. The Plan stipulated the development goals of transportation infrastructure network, the overall network size and composition, and the layout scheme for integrated grand transportation channel and integrated traffic hub for 2020; it provided the direction for formulating the layout of various transportation modes and development planning. On such basis, China will have constructed an integrated transport network with a total scale of over 3,380,000 km (excluding the mileage of airway, waterway, urban road and rural highway) by 2020. By that time, the framework of China's integrated transport network will be composed of the "five-longitudinal and five-horizontal" integrated grand transport channels and the international transport channels. Presently, these integrated grand transport channels and international transport channels are being successively constructed.

3.2 Development Status of Logistics Parks (Centers) and Storage Facilities

In 2011, China continued to promote the construction of logistics parks in logistics nodal cities, with two types of professional logistics parks (centers), viz. agricultural products cold chain logistics centers and commercial trade logistics parks. Meanwhile, storage facilities in China are also under continual construction.

3.2.1 Development Status of Logistics Parks (Centers)

3.2.1.1 Logistics Park Construction in Logistics Nodal Cities

Both national and regional logistics nodal cities accelerated the construction of logistics parks in 2011. National logistics nodal cities in the Central and Western Regions such as Zhengzhou of Henan, Lanzhou of Gansu and Chongqing, had signed contracts, laid foundations or received approval for some new large logistics park

[14] *Statistical Bulletin of Development of Civil Aviation (2011)*, published by the Civil Aviation Administration of China, 2012-05-07.

projects. In January 2011, the largest modern logistics park in South Yunnan Province, Yunnan New Asia-Pacific Logistics Port, commenced officially; in August 2011, Yantai International Integrated Logistics Park officially laid foundation for the construction work. In addition, as a regional logistics nodal city, Harbin launched the Harbin International Integrated Logistics Park Project in December 2011.

3.2.1.2 Construction of Agricultural Products Cold Chain and Commercial Trade Logistics Parks

In 2011, many relevant supportive policies, including the *Notice on Carrying out Relevant Issues Concerning Pilot Trials of Comprehensive Modern Agricultural Products Circulation*, and the *Opinions on the Policies and Measures for Promoting the Sound Development of Logistics Industry*, were issued. Prompted by these policies, local government started to encourage the construction of agriculture cold chain logistics centers, and led to the rapid development in this regard. In 2011, throughout the various regions there were many cold chain logistics centers undergoing foundation-laying or commencement of construction. In March 2011, the Ministry of Commerce, the NDRC and the China Co-Op jointly issued the *Special Planning for Business and Commerce Logistics Development*, which clearly specified that a host of commercial logistics parks possessing full functions in storage, sorting, processing, distribution, information service would be constructed or revamped.[15] Under such directives, numerous projects of large commercial logistics parks were started or began operation in Shandong, Heilongjiang, Guizhou, Yunnan, and Gansu provinces in 2011.

3.2.2 Development Status of Storage Facilities

In 2011, various real estate companies in China invested in building storage facilities, leading to a rapid development in this area. Among foreign-funded storage real-estate companies, such as Prologis (China), GLP (Global Logistics Properties, China), and Goodman Group ASX:GMG, successively invested in the construction of warehouses or logistics centers; among domestic-funded companies, certain regional warehouse real-estate companies such as Gaishi Group of Shandong, Bailiwei Logistics of Beijing had begun to construct storage facilities around the country. Some residential real-estate companies also started to invest in warehouses.[16]

[15] The Ministry of Commerce of the P.R.C., NDRC and China Co-op, Special Planning for Business and Commerce Logistics Development (SMF (2011) No.67), 2011-3-14. http://www.gov.cn/zwgk/2011-03/30/content_1834487.htm.

[16] *Development Characteristics of 2011 and Status Analysis of 2012 of Storage Industry*, China Association of Warehousing and Storage.

Among the various storage facilities, the construction of professional warehousing and commercial enterprise warehousing facilities developed the fastest in 2011. In terms of professional warehouses, construction of storage for steel, tobacco, medicine, and low-temperature goods was promoted; construction of chemical industrial parks and storage facilities of hazardous goods for ports was gradually accelerated. Enterprises like Shuanghui Group, Yurun Group, COFCO and China Merchants Americold were planning to develop nationwide cold chain systems and hazardous goods storage networks. As for general storage facilities, along with developing commerce, some professional chain enterprises and e-commerce enterprises started to accelerate their construction of storage networks. For example, Sunning Corporation, Alibaba, Amazon China and others had begun to construct their own logistics storage centers.

3.3 Development Status of China's Logistics Equipment

The total number of various transport vehicles in China continued to increase, and the transport efficiency continued to improve in 2011. As total demand of storage space expanded in China, the overall demand for various types of storage equipment increased accordingly. Meanwhile, storage equipment in China continued to change toward the direction of environmental protection and intellectualization. The R&D capability on environment-friendly storage equipment like plastic pallet and electric forklift had been enhanced continually, and the adoption of these equipment in storage operations had also been increased.

3.3.1 Development Status of Transport Vehicles

3.3.1.1 Continually Increased Number of Transport Vehicles

In 2011, the number of various transport vehicles continued to increase in China. By the end of 2011, the total number of trucks reached 11.80 million, showing a year-on-year growth of 12.3 %; the total number of ships was 179,200, an increase of 0.5 % from the previous year; total rail cars held was 649,495 units, a growth of 4.4 %[17] over the previous year; all-cargo aircrafts owned by domestic airfreight enterprises increased sharply with the total number of fleet reaching 91, an increase by 17, equaling an 18.2 % hike compared with that of 2010.[18]

[17] *Railway Statistics Bulletin* (2011), published by the Ministry of Railways of China, 2011-4-19.

[18] Zou Jianjun, "Review on Airfreight of 2011 and Expectations of 2010," China Logistics Development Seminar 2012, 2012-1-10.

3.3.1.2 Enhanced Capacity of Heavy-Load Transport Vehicles

In 2011, the overall capacity of various heavy-load highway and waterway transport vehicles continued to expand. The average tonnage of trucks reached 6.16 t/truck, showing a year-on-year growth of 0.45 t/truck. To meet the need of heavy cargo service of railway transport, China had accomplished the technical researches in brake technology for heavy-duty trucks, and fatigue life and reliability of car coupler for heavy-duty railway wagons. The average net deadweight of water transport ships reached 1,186 tons/ship, an increase of 17.3 %; total container slot was 1.48 million TEUs, an increase of 11.4 %; and the power level for ships was 59.50 million KW, an increase of 11.6 %.[19]

While striving to improve the capacity of heavy-load trucks, China had also reinforced the supervision on vehicle overload problems at the stage of truck production and sales. The Ministry of Industry and Information Technology vigorously coordinated with the Ministry of Transport and the Ministry of Public Security to strictly monitor truck manufacturers according to the regulations in the *Vehicle Production Enterprises and Products Announcement.* All administrative departments were instructed to strictly forbid the sales of vehicles with load limit not conforming to load specifications, or those which did not meeting the national standards. In March 2011, the State Council issued the *Regulation on Protecting Highway Safety*, pointing out that motor vehicles should conform to the national technical safety standards on "dimensions, axle load and overall quality." Vehicles not conforming to these standards are prohibited from production and sales. These measures would help to solve the problem of nonconformity between actual vehicle load and vehicle load specifications.

3.3.2 Development Status of Storage Equipment

3.3.2.1 Storage Rack

In 2011, as construction for logistics distribution centers of tobacco industry emerged continuously, mid- and high-end storage racks were adopted more widely in these centers. Medicine distribution centers, pharmaceutical enterprises and medicine circulation enterprises, guided by the new medical reform policy, accelerated the construction of automatic three-dimensional warehouse, which made storage rack more widely utilized in medicine logistics. In addition, storage racks were also widely adopted in industries with steady increase of storage needs such as machinery, auto and electronics industries.[20]

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[19] *Statistical Bulletin of Highway and Waterway Transportation Industry (2011)*, published by the Ministry of Transport of China, 2012-4-25.

[20] Wang Jixiang, "Analysis on China Logistics Equipment Industry of 2011 and Forecast of 2012," China Logistics Development Seminar 2012, 2012-1-10.

Several other booming industries also added to the demand of storage racks considerably. For example, as business volume of e-commerce increased significantly and the construction of e-commerce logistics centers accelerated, e-commerce logistics became the field with most notable increase in storage rack application. Next, as the nation's power system sped up the construction of smart grid and began to build distribution centers for grid instruments in large scale, the demand for storage rack also jumped noticeably in this field. Moreover, storage racks were in much greater need in the rapidly expanded logistics centers of many chain supermarkets.[21]

3.3.2.2 Pallet

With the recent emphasis on global energy-saving, environmental protection and low carbon consumption, the use of plastic pallet in China was up markedly, with an average annual growth rate of nearly 20 %. Currently, plastic pallet has been widely applied in industries such as food, medicine, machinery, auto, chemical industry, book & audio distribution, and three-dimensional warehouses [22]

3.3.2.3 Forklift

In 2011, demand for forklift continued to climb in China, reaching 313,850 units.[23] However, the proportion of electric fork-lifts was still low. On account of such deficiency, forklift enterprises continued to pour into the research and production of electric forklifts. For example, Anhui Forklift Group Co., Ltd. raised the capital investment in Ningbo Liftstar Material Handling Equipment Co., Ltd. to jointly design and manufacture electric forklifts; Noblelift, Liugong Machinery, and Lonking Machinery all regarded electric forklift as an important product to research and manufacture. The increased resource into electric forklift research would conceivably improve the supply capacity of mid- and high-end forklifts in China.[24] It is expected that economic development, requirements on environmental protection and energy saving will gradually perk up the proportion of electric forklift usage in China.

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[21] Wang Jixiang, "Analysis on China Logistics Equipment Industry of 2011 and Forecast of 2012," China Logistics Development Seminar 2012, 2012-1-10.

[22] "Plastic pallet market is expanded continuously with public pallet system construction accelerated," China Logistics Products Network, 2011-8-25. http://info.10000link.com/newsdetail.aspx?doc=610194032.

[23] "Forklift industry: sales volume of forklift is expected to be equal to that of last year," China Electromechanical Network, 2012-10-22.

[24] Zhang Yan, "Logistics equipment and technology industry: Wholly developing toward good conditions in fast speed," Logistics Newspaper, 2011-12-31.

3.4 Logistics Informatization and Standardization in China

The application of informatization and automation in logistics field was further expanded in 2011, with breakthrough made in the establishment of international logistics information platform. The release and implementation of the *"Twelfth Five-Year" Plan for Standardization Development* and the formal issuance of the *Catalog of Logistics Standard* served as an effective guide for preparing and implementing logistics standards in China. Standardization administration organization of China has gradually been perfected, successively setting a series of new national basic logistics standards and professional logistics standards which would further promote the logistics standardization development in China.

3.4.1 Development Status of China's Logistics Informatization

3.4.1.1 Informatization and Automation Application

According to the survey data of the *Report of China Logistics Development (2012)*,[25] the application of automatic recognition technology and global positioning system (GPS) technology in logistics business of industrial and commercial enterprises continued to increase in 2011 (as shown in Table 3.3), and the majority of industrial and commercial enterprises had adopted the barcode, GPS and other logistics information technologies. Barcode technology has been widely applied in nearly 80 % of such enterprises. As the Internet of Things is developing, more and more industrial and commercial enterprises begin to apply RFID technology in their logistics operations. . Again according to the survey data of the aforementioned Report,[26] about 15 % of such enterprises have adopted RFID technology in logistics operations.

In terms of automation technologies, the adoption rate of delivery and sorting equipment in e-commerce logistics, express delivery service, commercial logistics, apparel logistics, and postal service logistics was expanded fairly quickly in 2011. Meanwhile, in the traditional application fields such as tobacco, medicine, circulation, post, and books, delivery and sorting technologies also became more widely applied.[27]

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[25] "*Report of China Logistics Development (2012),"* published by the Bureau of Economic Operations Adjustment, the National Development and Reform Commission, and the Logistics Research Center, Nankai University, 2012-9.

[26] "*Report of China Logistics Development (2012)*," the Bureau of Economic Operations Adjustment, the National Development and Reform Commission, and the Logistics Research Center, Nankai University, 2012-9.

[27] Wang Jixiang, "Analysis on China Logistics Equipment Industry of 2011 and Fore cast of 2012," China Logistics Development Seminar 2012, 2012-1-10.

Table 3.3 Types of logistics information technologies adopted by industrial and commercial enterprises (Multiple responses included) (Unit: %)

Item	Year				
	2007	2008	2009	2010	2011
Barcode technology	58.7	62.2	67.4	72.5	78.7
Global positioning system (GPS)	23.3	25.4	32.6	38.9	41.3
Electronic data interchange system (EDI)	43.8	42.2	37.2	37.3	37.0
Electronic ordering system (EOS)	18.5	19.7	18.6	19.1	25.3
Automatic sorting system (ASS)	18.5	18.5	17.2	15.7	14.3
Radio frequency identification (RFID)	8.3	10.3	14.3	16.2	15.3
Others	3.7	1.8	14.0	14.1	11.7

Source: *Report of China Logistics Development (2012),* published by the Bureau of Economic Operations Adjustment, the National Development and Reform Commission, and the Logistics Research Center, Nankai University

3.4.1.2 Construction of International Logistics Information Platform

Ministers of the Ministry of Transport and Logistics Department of China, Japan and South Korea jointly signed the *Joint Declaration of the 3rd China-Korea-Japan Ministerial Conference on Transport and Logistics* in May 2010 and formally founded the "Northeast Asia Logistics Information Service Network" in December 2010. Composed of China Communications Logistics LOGINK System (LOGINK for short), COLINES of Japan and SP-IDC of South Korea, the Network was regarded as an international non-profit technical exchange and application cooperation mechanism for logistics information interconnection, exchange and sharing. In December 2011, the Northeast Asia logistics information sharing service interface was formally launched. This was China's first linkage with international logistics information platform, which symbolizes that the first global international logistics information sharing cooperation mechanism—the Northeast Asia Logistics Information Service Network was formally put into application. It will promote the overall level of logistics informatization in China, Japan and Korea or even the whole Northeast Asia.

3.4.2 Development Status of China's Logistics Standardization

3.4.2.1 Issuance of "The Twelfth Five-year" Plan for Standardization Development

In December 2011, the Standardization Administration of China implemented "the *Twelfth Five-year" Plan for Standardization Development,* which considered logistics service as one of the key service industries for constructing systems of standards. It proposed to revise the standards for management, technology, service and information, for public logistics such as third-part logistics, logistics supply chain, public logistics service platform, logistics facilities, cold chain service,

logistics park, e-commerce, freight forwarder, and storage; and for professional logistics such as express mail service, auto, medicine, agricultural product, staple mineral products and important industrial products.[28]

3.4.2.2 Formal Issuance of the Catalog of Logistics Standards

In September 2011, the *Catalog of Logistics Standards* was formally issued. It gathered a total of 601 current catalogs of national logistics standards, industrial standards and local standards issued in China, and classified them into four sections: basic standards, public standards, professional standards and standardized guidance documents.[29] The Catalog objectively assessed the current situation of logistics standardization in China and provided a credible document for understanding and applying the logistics standards, thus effectively played a guiding and regulating role for industries in conforming to the current standards.

3.4.2.3 Gradually Perfected Administration for Standardization Technology

In 2011, some new administrations for standardization technology were under preparation or being established in China. In July 2011, the Specialized Committee of Storage Facilities and Technology Application, under CAWS, was founded to be mainly responsible for promoting the technical innovation of the storage industry and conducting research on industrial standards. In December 2011, the Standardization Administration of P.R.C. approved the Ministry of Transport to set up the National Committee for Standardization of Ports. The task force was instituted to meet the need of port construction and to promote the ports develop toward modernization, specialization and standardization.

3.4.2.4 Progress in Preparing National Basic Logistics Standards

Following the time frame of the *"Twelfth Five-Year" Plan for Standardization Development*, China formally formulated, issued and enacted many national basic logistics standards in 2011, covering logistics service, logistics operations, logistics informatization and other aspects, as shown in Table 3.4. Furthermore, 14 national standards for logistics informatization such as the *Code for Functional Safety of Logistics Automation System* and the *Technical Specifications for Carousel Sorting Technology of Logistics Storage and Distribution Center* were formulated and implemented successively.

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[28] *Notice on issuing "the Twelfth Five-year" Plan for Standardization Development,* Standardization Administration of China, 2011-12-28.

[29] *Trends of Logistics Standardization (2011–12)*, China Federation of Logistics and Purchasing. http://www.chinawuliu.com.cn/lhhkx/ 201201/04/176778.shtml. 2012-01-04.

Table 3.4 National basic logistics standards formulated, issued or enacted in 2011

Category	Name of standards	Status
National standards for logistics service	*Classification and Coding for Logistics Service*	Enacted
	Goods Classification and Code for Logistics Operation	Issued
National standards for storage, loading & unloading and handling	*Container Reach Stacker—Specifications*; *Container Securing Fitting for Ships*, etc.	Enacted
	Sizes and Load Ratings for Industrial Rack; *Assembled Plastic Pallet*; *Conversion Unit of Quantitative Analysis for Freight Containers*, etc.	Issued
	Technical Specifications for Carousel Sorting of Logistics Storage and Distribution Center; *Technical Specification for Screw Box Conveyor of Logistics Storage and Distribution Center*; *Technical Specification for Box Multiplayer Continuous Elevator of Logistics Storage and Distribution Center*; *Classification, Terminology of Conveying and Sorting Systems and Peripheral Equipment of Logistics Storage and Distribution Center*	Formulated
Relevant national standards for logistics informatization	*Functions and Design Requirements of Logistics Management Information System*; *Logistics Network Information Systems Risk and Prevention*	Enacted
	Coding Rules for International Freight Forwarding Documents' Identifier; *Code of Information Interchanges for International Freight Forwarding Operation*, etc.	Enacted
	Two-dimensional Barcode–Grid Matrix Code; *Two-dimensional Barcode–Compact Matrix Code*; *Freight Containers-Radio Frequency Identification-License Plate Tag*	Issued
	Logistics Electronic Code–Label Data Conversion; *Goods Electronic Code–Information Service*; *Information Safety Technology–RFID Cryptography Specifications*, etc.	Formulated

Source: Compiled from the *Notice on Issuing Formulation and Revision Plan for the First Batch (Second Batch, Third Batch) of National Standards in 2011* (GBWZH [2011] No.57, GBWZH [2011] No.66, GBWZH [2011] No.82), the *Notice on Approving and Releasing No.1-25 National Standards in 2011* (by Standardization Administration of China); the *Trend of Logistics Standardization* (by China Federation of Logistics and Purchasing, 2011–12)

3.4.2.5 Progress in Preparing for the National Professional Logistics Standards

In 2011, the task of standardization on agricultural products logistics, hazardous goods logistics, and cold chain logistics made notable progress in China (see Table 3.5). The formulation, enactment, revision and implementation of

Table 3.5 National professional logistics standards formally formulated or enacted in China in 2011

Category	Name of standards	State
National standards for agricultural products logistics	*General Technical Requirements for Packing Materials of Agricultural Products; Logistics* and *General Technical Requirements for Packing Container of Agricultural Products Logistics*	Formulated
	Guidelines for Storage and Transportation Technique of Vegetables; Terminology of Grain and Oils–Storage Equipment and Establishment	Enacted
	Grain and Oils Storage–Technology Regulation of Heat Insulation in Warehouse; *Grain and Oil Storage–Basic Requirements for Auto-control System of Ventilation* and Other Standards for Food Storage Logistics	Enacted
	Onions–Guide to Storage and Other Standards for Agricultural Products Storage Logistics	Enacted
National standards for automotive logistics	*Technical Requirements for Urban Logistics Vehicles*	Formulated
National standards for cold chain logistics	*Root Vegetables–Cold Storage and Refrigerated Transport*; *Early Potatoes–Guide to Cold, Cooling and Refrigerated Transport*, etc.	Enacted
	Safety Code for Cold Store; *Code of Practice for Live Fish Transportation* and *General Requirements of Aquatic Products Package for Air Transportation*	Issued
	Porphyra Yezoensis–Technical Specifications for Refrigeration Network Operation	Formulated
National standards for dangerous goods logistics	*International Transport Documents of Dangerous Goods*	Formulated
	Transport of Dangerous Goods–Specification on the Acceptance and Classification Procedure and the Requirement of Compatibility of Explosives and *Transport of Dangerous Goods–Test Method and Criteria of Acceptance and Classification for Explosives*	Revised
National standards for emergency logistics	*Guide for Emergency Logistics Technology System Construction of Earthquake Rescue Team*	Formulated
Express service logistics	*Express Services—Part 1: Basic Terminology*; *Express Services—Part 2: Organization Requirements; Express Services—Part 3: Service Procedures*	Issued

Source: Compiled from the *Notice on Issuing Formulation and Revision Plan for the First Batch (Second Batch, Third Batch) of National Standards in 2011* (GBWZH [2011] No.57, GBWZH [2011] No.66, GBWZH [2011] No.82), the *Notice on Approving and Releasing No.1-25 National Standards in 2011* (by Standardization Administration of China); the *Trend of Logistics Standardization* (by China Federation of Logistics and Purchasing, 2011–12)

various professional logistics standards played an active guiding and regulating role in logistics service, logistics technology and logistics operations of certain specific industries.

3.5 Summary

This chapter presents the development of logistics facilities and technology in China in 2011 from four aspects: construction of transport infrastructure, construction of logistics parks and storage facilities, logistics equipment, and logistics informatization and standardization. In terms of transportation infrastructure, integrated transport system construction was promoted successively, which further improved the capability and efficiency of China's logistics. As for logistics parks and storage facilities, cold chain logistics parks and commercial logistics centers were constructed in a fairly fast pace under the guidance of relevant policies. Many real-estate companies invested in the construction of storage facilities, thus propelling the swift development of storage facilities. For logistics equipment, various transport vehicles achieved better efficiency, and storage equipment continued to develop toward environment protection and intellectualization. In terms of logistics informatization, international logistics information platform construction witnessed a new breakthrough. As for logistics standardization, various new national logistics standards were enacted and implemented successively in 2011. The implementation of the *"Twelfth Five-year" Plan for Standardization Development* would further promote the development of logistics standardization in the coming years.

Chapter 4
Policies and Plans on China's Logistics Development

Kena Li

Over the years, China's Government has continually placed high value on the guiding and supporting role of policies in logistics development and has committed to establishing and constantly improving its logistics policy system, for the purpose of achieving a rapid and sound logistics development under favorable policy environment. This recognition has made the position and role of logistics increasingly important in the national economic planning. After years of effort, China's logistics policy system has gradually become clearer and basically being shaped into a policy system framework with Chinese characteristics.

This chapter first gives a brief introduction to the development and key contents of China's logistics policy system to provide the readers with a macro perspective. Subsequently it presents a more detailed description and analysis of the contents of China's logistics policies and plans in 2011 and their impact on logistics development. The main subjects addressed in this chapter include: characteristics of China's logistics policies and plans in 2011; contents and implementation essentials of the *Opinions on the Policies and Measures for Promoting the Sound Development of the Logistics Industry* (hereinafter referred to as the "State's Nine Guidelines"); issuance of industrial and special logistics policies; issuance of special logistics plans and regional plans.

4.1 A Recap of the Evolution and Key Contents of China's Logistics Policy System

Since its reform and opening-up in the 80s, China has witnessed a rapid economic growth and an accelerated internationalization process. The concept of international supply chain and modern logistics was brought into China in the late 1980s.

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Consequently, China's transport authorities, commerce and trade authorities and other relevant authorities began to apply the theory of modern logistics, consult practical experience of advanced countries to formulate relevant policies and plans; these include plans on establishment of highway logistics networks and highway transport hub stations and policies on commodity logistics distribution and distribution center construction. With the acceleration of global economic integration and China's accession to WTO, relevant departments in the Central Government began to realize the important supporting role modern logistics play in enhancing the competitiveness of China's enterprises, industries and the entire national economy. Modern logistics, as a kind of advanced organizational mode and management technology, has generated a widespread attention among the governmental agencies. And governments at all levels have been actively issuing pertinent policies and plans to foster the development of modern logistics.

In 2001, the National Development and Reform Commission (NDRC) issued the *Several Opinions on Accelerating the Development of Modern Logistics*, which was China's first guiding document specifically on the development of modern logistics. Since numerous departments were involved in advancing modern logistics, the Central Government established a joint conference mechanism composed of 34 relevant departments. The NDRC led and organized all the relevant departments to hold joint meetings regularly and issued various policies together with these departments. Under the Government's vigorous promotion, policies on logistics development started from scratch and developed over time toward a sound and sensible policy system.

Viewing from the constitution of the policy framework, the policies encompass a wide spectrum, ranging from comprehensive to industry-specific, nationwide to regional, national-level to local-level, and of macro guidelines to micro operational regulations. Invariably soon after the Central Government formulated and issued some comprehensive steering policies and plans, administrative authorities of relevant industries would follow up with operating policies and measures concerning highway, railway, commercial circulation, and logistics informatization. Furthermore, regulations would also be formulated on specific financial support for transportation, express delivery, agricultural products, informatization, energy conservation and emission reduction and other fields. In the year when the State issued the *Adjustment and Development Plan of Logistics Industry*, approximately 20 provinces and municipalities formulated local development plans for the logistics industry.

The coverage of these policies are quite broad, encompassing the macro-control policy of logistics industry, logistics market opening-up policy, construction and networking policies of logistics and transportation infrastructure, express market standardization policy, commercial circulation policy, agricultural products and rural logistics policy, construction policy of Internet of things and logistics informatization, and international logistics policies on bonded zone, customs clearance, and commodity inspection.

Over the years, the guiding and regulating effects of these logistics policies have become more and more prominent. These effects include notably the following: achieving full opening of the logistics market, formation of preliminary comprehensive

transportation network architecture, realization of a toll-free green channel for transporting agricultural products, standardization of highway transport and express market, and development of logistics informatization and international logistics.

In particular, China's logistics infrastructure witnessed a rapid development in the last decades. A series of policies and plans were successively issued for national highway, waterway, civil aviation, railway, comprehensive transportation, and logistics parks. The State had continually imparted considerable resources on logistics infrastructure construction to provide favorable conditions for the nation's logistics development. By 2010, the length of railways in operation nationwide had reached 91,000 km, ranking second in the world, and the total length of highways in operation had reached 71,000 km, behind only that of the US. Six ports of China ranked among the top 10 international ports in terms of container throughput. During the past decade, China also witnessed a rapid development of its regional and specialized logistics centers, logistics parks, bonded logistics parks, and bonded ports.

4.2 Characteristics of China's Logistics Policies and Plans in 2011

Of China's recent "Five-Year" plans, the "Twelfth Five-Year" Plan has the most contents on logistics development, which shows the significantly elevated emphasis of the Government on logistics development. In 2011, the first year of its implementation, logistics policies manifested the following attributes: (1) intensive issuance of State-level logistics policies by the Central Government; (2) many logistics policies issued jointly by the relevant responsible government authorities; (3) further detailing of logistics policies and measures; (4) more specific preferential policies; and (5) expanded integration of logistics policies with administrative policies of other fields. These characteristics are described more fully in the following sections.

4.2.1 Intensive Issuance of State-Level Logistics Policies

In 2011, the State issued the "Twelfth Five-year" Plan and the *Policies and Measures for Promoting the Sound Development of the Logistics Industry* (the "State's Nine Guidelines"), which are two high-level and steering documents on China's logistics, evidencing that logistics development has become a prominent focus of national economic development.

In March 2011, the National People's Congress approved the "Twelfth Five-Year Plan," in which logistics was emphasized in the following specific areas: accelerating the establishment of a socialized, specialized and IT-based modern logistics service system; actively developing third-party logistics; strengthening the construction and connection of logistics infrastructures; improving logistics efficiency and reducing logistics cost; promoting the development of logistics in key fields such as agricultural

products, bulk minerals and important industrial products; optimizing the regional balance of logistics development; supporting an orderly establishment of logistics parks; improving the level of logistics intelligentization and standardization.

In June 2011, the issue on development of logistics industry became an agenda item at the Executive Meeting of the State Council resided by the Prime Minister. Subjects studied and assigned by the State Council Meeting encompassed the following: developing pilot projects for reforming the taxation system of the service industries to resolve the problem of repetitive taxation pertaining to the logistics industry under the current system; managing overloading problems in highway transportation; encouraging imparting non-government capitals in railway infrastructure construction. Afterwards, aiming at the major problems in the development of logistics industry, the State Council issued the *Policies and Measures for Promoting the Sound Development of the Logistics Industry* (the "State's Nine Guidelines"), which was deemed as China's second overarching document on the development of logistics industry following the primary document of *Adjustment and Development Plan of Logistics Industry*.

4.2.2 Strengthening of Multi-department Comprehensive Coordination and Administrative Mechanism

Logistics development involves many spheres and numerous departments; hence various logistics policy documents were issued jointly by many ministries and commissions in recent years. In 2011, nearly 50 % of the policy documents were issued jointly by relevant ministries and commissions. For example, the Ministry of Transport, the National Development and Reform Commission, the Ministry of Finance and the Ministry of Supervision jointly issued the *Circular on Carrying out Special Clean-up Task of Toll Road* to assign duties and stipulate overall requirements for the special clean-up task of regulating toll charges. The Ministry of Transport, the Ministry of Public Security, the Ministry of Industry and Information Technology, the State Administration for Industry and Commerce, the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), the State Administration of Work Safety and other departments jointly issued the *Circular on Further Strengthening the Governance on Illegal Overloading of Vehicles.* The Circular outlined specific requirements for supervising vehicles overloading violations and improving its long-term mechanism of governance. In addition, the Ministry of Finance and the State Administration of Taxation, together with the Ministry of Transport and the Ministry of Commerce, issued several incentive policies for providing capital subsidy and tax allowance to projects on energy conservation and emission reduction and agricultural products logistics. These joint policy documents specified the division of responsibilities and joint management among all departments, indicating that China is strengthening its comprehensive coordination mechanism of modern logistics development.

4.2.3 Further Detailing of Logistics Policies and Measures

As for the contents of logistics policies issued in 2011, many of them are elaborations of policies that were issued in previous years, showing that China's logistics policy system is progressing and deepening. For example, the "State's Nine Guidelines" is the extension and substantiation of the *Adjustment and Development Plan of Logistics Industry*. Aiming at curing the critical problems which had constrained the development of logistics industry for a long period, the "State's Nine Guidelines" contains over forty specific policies and measures, covering the following nine respects: taxation, land, transportation, system reform, resource integration, technical innovation, expansion of input, agricultural products logistics, and organization and coordination. Besides, in 2011, a series of policies and plans were successively issued for the transportation industry, the express industry, the commercial circulation field, e-commerce, and some other industries and professional fields. Such policies and plans, including policies both on industry guidelines and market regulations, are also the deepening and detailing of former policies and plans.

4.2.4 Intensified Government Support and Incentive Policies on Key Logistics Projects

Offering support and incentive in terms of finance and taxation is an important component and outstanding feature of the 2011 logistics policies, showing that China's logistics policies and means are becoming more pragmatic. In 2011, the number of incentive and supportive policies jointly issued by the Ministry of Finance and other related ministries increased notably as compared to that of the previous years; the scope and the amount of subsidization were also increased substantially. Subsidies were disbursed for some approved projects by the Finance department from special funds. In agricultural products logistics, subsidized projects covered areas in reconstruction of processing and distribution centers of agricultural products, linkage between farmer's cooperatives and supermarkets, refrigeration and preservation facilities, refrigerated transportation equipment, and cold chain logistics distribution centers In transportation, subsidies were granted to projects in development of energy-conservation technologies, replacement of aged vehicles, application of new energy transportation facilities, and other low-carbon transportation items. In terms of logistics informatization, Internet of things and e-commerce were classified as national key projects eligible for support.

4.2.5 Enhanced Integration of Logistics Policies with Administrative Policies of Other Fields

Along with the increasingly prominent position and function of logistics in various industries, integrations of logistics policies with administrative policies

of other fields are being extended gradually. Government authorities in charge of various industries began to integrate logistics administrative policies and supply chain management concepts into industrial policies and have achieved excellent regulative effects. Concrete and notable achievements are manifested in diverse areas, such as reformation of national medical system, increase of citizens' livelihood supplies, large-scale international competitions, emergency relief for natural disasters, enhancement in food and drug safety practices, and price containment of agricultural products. For example, in reforming the national medical system, the Government treated medicine logistics as a critical matter and formulated concrete schemes for closed-loop supply chain and cold chain logistics for pharmaceuticals production and distribution. Meanwhile, to realize price control for agricultural products, the Government enacted various measures to open a "Green Channel" and exempted the road tolls for agricultural products along the Channel.

4.2.6 Inter-regional Channels as Key to Regional Planning

In 2011, the State continued to issue a series of regional plans, such as the *Overall Scheme on Construction of National Eastern, Central and Western Regional Cooperation Demonstration Zone,* the *Development Plan for Coastal Areas of Hebei*, the *Guiding Opinions on Supporting Henan Province to Accelerate the Construction of Central Plains Economic Region*, the *Chengdu-Chongqing Economic Zone Regional Planning* and the *Opinions on Supporting Yunnan Province to Accelerate the Construction of an Important Bridgehead Open to the Southwest Region*. All these plans focused on the construction of inter-regional transport channels, which connected the separate transport channels in the Eastern, the Central, and the Western Regions and throughout the country, and affirmed China's grand scheme for achieving inter-regional cooperation and coordinated development.

4.3 Contents and Implementation of the "State's Nine Guidelines" for Logistics Industry

Reflecting China's continual attention paid to the implementation and progress of the *Adjustment and Development Plan of Logistics Industry*, the State Council timely released the "State's Nine Guidelines" in the last year of the Eleventh Five-Year Planning period. Through it the Council proposed multiple concrete solutions aiming at resolving the serious problems encountered during the development of China's logistics industry at present. This section provides more details on the contents and the specifics of the "Nine Guidelines."

4.3.1 Key Contents of the "State's Nine Guidelines" and Its Role in Promoting the Logistics Industry

The "State's Nine Guidelines" is a follow-up document on logistics development featuring a broad coverage and high operability, aimed to improve the development environment of logistics enterprises, strengthen their core competitiveness, and promote its sound development.

4.3.1.1 Reduction of Logistics cost Through Tax Relief and Amelioration of Charges

The Guidelines mandated to study and to resolve the inconsistency between business tax rates of warehousing, distribution, freight forwarding links and that in transport link, and to study and improve the tax policy on land use for warehousing facilities of bulk commodities. In terms of road toll, it proposed to orderly cancel the fees of government loans for the construction of grade II roads and revoke unjustified tollbooths. This document also required relevant departments to accelerate the establishment of charging standards and the *Regulation on the Administration of Toll Roads* to reduce highway tolls and standardize its administration.

4.3.1.2 Direct Support for Logistics Industry in Land, Market Access, and Financing

First, the Guidelines granted priority assurance and preferential arrangement to land use for already planned logistics parks. Secondly, the Guidelines pointed out that, within the premise of regulatory bounds, the administrative agencies should suitably relax the conditions for approval on the qualification of logistics enterprises, and to encourage logistics enterprises to develop inter-regional networking operations.

Thirdly, the Guidelines gave necessary financial support to major eligible logistics enterprises for the construction of transportation, warehousing, distribution and information facilities as well as infrastructure of logistics parks. It also called for continual improvement of the investment and financing mechanism for logistics industry to assure the funding of key projects.

Fourthly, the Guidelines dictated several measures to streamline the logistics practices. These include measures: (a) to support logistics enterprises to integrate logistics resources through merger and reorganization, cooperation and alliance, and other modes; (b) to help commercial circulation enterprises develop joint distribution; and (c) to institute supportive policies on taxation, and personnel placement to encourage manufacturing enterprises relinquishing their own logistics assets and logistics operations. Finally, the Guidelines encouraged logistics enterprises to apply supply chain management technology and information

technology, and actively offered supports to logistics enterprises for establishing logistics information platform.

4.3.1.3 Giving Priority to the Development of Agricultural Products Logistics

The Guidelines required giving priority to develop agricultural products logistics and set up an open, efficient, safe and convenient logistics system of agricultural products. Besides, it also proposed to offer funding allowance to projects which propagate the direct distribution of agricultural products from origins to destinations, the construction of cold chain logistics system, and the construction of networks and channels in circulation of agricultural products.

4.3.1.4 Complementary Policies for Logistics to be Improved in the Near Future

The Guidelines stipulated that relevant departments, on functionally-based division of labor, to create a favorable policy and institutional environment for furthering the sound development of logistics industry. The specific detailed complementary supporting policies include the following items.

First, based on the experience of the tax reform pilot project, to improve relevant supporting measures and carry out the full implementation. Secondly, to formulate special plans on the development of logistics parks nationwide.

Thirdly, to study and revise the *Regulation on the Administration of Toll Roads* and improve the measures for administration of highway transport of large objects, and establish the regulations on managing vehicle overload on the highway. Finally, by formulation and revision of relevant laws and administrative regulations, and within the premise of regulatory bounds, to appropriately relax the conditions for approval of business license for logistics enterprises, and improve the qualification approval administration process.

4.3.2 Implementation of the "State's Nine Guidelines"

After the issuance of the "State's Nine Guidelines," various government departments began to put forth various implementation measures and supporting policies. In December 2011, the General Office of the State Council issued the *Circular on Printing and Issuing the Scheme on Department Division of Responsibilities for Implementation of the Opinions on Policies and Measures for Promoting the Sound Development of the Logistics Industry* and detailed the Guidelines into 47 concrete tasks, and specified the 31 responsible departments and units. The Ministry of Finance and the State Administration of Taxation jointly issued the *Circular on the*

Policy for Tax on Using Urban Land for Bulk Commodity Warehousing Facilities of Logistics Enterprises, to give a 50 % reduction in taxes to logistics enterprises using (or renting) self-owned land for bulk commodity warehousing facilities. A pilot project of logistics industry tax reform was tested out for the transportation industry in Shanghai.

4.4 Issuance of Industrial and Special Logistics Policies

In 2011, centering around the major tasks put forward in the "Twelfth Five-year" Plan and the *Adjustment and Development Plan of Logistics Industry*, China's various governmental departments formulated many specific industrial policies and special policies for logistics development, which mainly covered the areas like express delivery, transportation, Internet of things and e-commerce.

4.4.1 Continually Improving Complementary Policies for Express Industry

In recent years, a rapidly-rising surge in online shopping greatly propelled the advancement of domestic express industry, but many problems also surfaced during the latter's rapid development. Establishment of a sensible policy system has become an urgent priority for ensuring the sound development of the express industry. In 2011, China continued to issue a series of guiding and regulatory policies specifically for the express industry and further strengthened its policy system.

4.4.1.1 Macro Guiding Policies

In July 2011, the State Post Bureau issued the *"Twelfth Five-Year" Plan for Development of Postal Industry* and established the development objectives and main tasks of express industry based on an analysis of the status and the trend of the industry. This Plan set up the specific development objectives with respect to the scale and service of express industry by 2015. For scale, the goals were to raise the business volume of express delivery up to 6.1 billion units, with an average annual growth rate of 21 %, and the revenue from express delivery up to 143 billion RMB, with an average annual growth rate of 20 %. As to service, the aims set for major express delivery enterprises were to upgrade their service capability to a 98 % coverage rate in State-governed municipalities and the provincial capitals, and over 90 % rate in provincially-administered municipalities, to achieve a service level of 90 % rate of delivering within 72 h between provincial capitals and major cities, to improve the service quality to meeting that specified in the *Express Service Standard,* and to achieve an overall user satisfaction score over 70 points. Seven major tasks were defined in this Plan

for the transformation and upgrading of express delivery industry. Specifically, these include the construction of independent express air transport network, the construction of express logistics parks, informatization construction, environment protection and energy conservation, and green development. Meanwhile, the development strategy supported the express delivery enterprises to develop cross-border and transnational operations and to act towards internationalization. Moreover, this Plan also contained specific measures for overseeing enterprise's management conduct, strengthening the safety surveillance, and optimizing the market environment.

4.4.1.2 Market Regulation Policies

The majority of policies issued by China's Government in 2011 for express industry were of regulatory nature for the express market, such as the *Provisions on Annual Report of Express Business Permit*, the *Franchise (Concession) Contract for Express Industry,* the *Guides and Specifications for Express Operations,* the *Measures for Supervision and Administration of the Security of Postal Industry*, and the *Measures for Settlement of Consumer Complaints of the Postal Industry.* The issuance and subsequent enactment of these policies and systems provided the legal basis for the administrative institutions in managing and overseeing the industry. In 2011, the State Post Bureau strengthened the supervision on express market and by law banned some enterprises engaging in express business without permit, thus cleansing the business environment of the express delivery industry.

4.4.1.3 Transformation and Upgrading Guidance Policies

To implement the *"Twelfth Five-year" Plan for Development of Postal Industry*, the State Post Bureau issued a series of policies for enterprise transformation and upgrading in 2011., Specifically these policies include: the *Guiding Opinions on the Merger and Restructuring of Express Delivery Enterprises*, the *Administrative Measures for the Rating of Express Delivery Enterprises*, and the *Guiding Opinions on the Promotion of Technology Advancement of the Postal Industry.* These policy documents granted preferential incentives in taxation to the restructuring and reform of express delivery enterprises, and the application of advanced management practices and technology. These policies also encouraged express delivery enterprises to develop in scale and service capability, and to raise their competence level in scientific and technological applications.

4.4.2 Policies for Promoting the Modernization of Transportation Industry

In 2011, China witnessed a year of intensive issuance of transportation policies and one which the transportation industry made a strategic shift toward modernization.

The relevant departments formulated and carried out a series of policies and measures in this year to improve and sustain the level of modernization of China's transportation industry.

4.4.2.1 Policies for Promoting the Development of Inland Water Transportation

China has abundant inland waterway resources stemming from its five major inland rivers. The main channel of Yangtze River has become the busiest navigable river in the world with the highest freight volume. The Government issued a series of policy documents in 2011 to leverage the potential and advantage of water transportation.

In January, 2011, the State Council promulgated the *Opinions on Accelerating the Development of Water Transportation of Yangtze River and Other Inland Rivers* and laid down the objectives of accelerating the development of its water transportation. Specific goals for the upcoming 10 years are: setting up an open, efficient, safe and green modern inland water transportation system, establishing a comprehensive supervision and rescue system of modern inland water transportation, and improving transport efficiency as well as the capacity for energy conservation and emission reduction. This document specified the tasks and assurance measures for constructing high-grade waterways, establishing efficient and safe inland water transportation systems, and attaining environmental protection. To substantiate the State Council's Plan, the Ministry of Transport and seven provinces and two cities along the Yangtze River jointly formulated the *Overall Scheme on Promoting the Construction of the Yangtze River Golden Waterway during the "Twelfth Five-year Plan" Period.* The Scheme contains the core emphasis, the guarantee measures and the schedule for implementing the key construction projects.

4.4.2.2 Policies for Promoting the Development of Multimodal Transport

In recent years, while accelerating the construction of a comprehensive transportation system, China's Government also took note of multimodal transport as a major task to promote. In September 2011, based on the issuance of the *Cooperation Agreement on Joint Promotion of Development of Railway-River Combined Transport* by the State Council, the Ministry of Transport and the Ministry of Railways also jointly promulgated the *Guiding Opinions on Acceleration of the Development of Railway-River Combined Transport.* The latter document specified the objectives, the main tasks, and the guarantee measures for implementing the policy. In addition, with the promotion of the two Ministries, projects of combined railway-highway transport increased tangibly and played a more prominent role in the receiving-distributing and bulk cargo transportation at ports, as well as in transnational and cross-border transportation.

4.4.2.3 Policies for Standardizing the Market Order of Road Transportation

In July 2011, to intensify the efforts on curbing the overloading problems and to establish a long-term mechanism for ensuring the results of overloading governance achieved in the past several years, the Ministry of Transport issued the *Circular on Strengthening the Governance on Illegal Overloading of Freight Vehicles from the Source*, in which the measures and tasks for strengthening the supervision from the source were specified. In October 2011, aiming at the problems of receding efforts on overloading governance and the resurgence of overloading practices, the Ministry of Transport, the Ministry of Public Security and other four ministries jointly issued the *Circular on Further Strengthening the Governance on Illegal Overloading of Vehicles*, and specified the problems to be solved and the future tasks to be carried out by each ministry. A co-management mechanism was also established for this purpose.

In addition, the Ministry of Transport also regarded the establishment of a credit system and the standardization of market order as important levers in raising the civil level of the transportation industry. It issued the *Opinions on Further Strengthening the Establishment of a Credit System for Road Transportation Market*, which defined the objectives and tasks of establishing a mechanism for credibility regulation and assessment, and penalty for credit fraud, for the nation's road transportation market in 5 years.

4.4.2.4 Reward Policies for Energy Conservation and Emission Reduction in the Transportation Industry

Transportation industry is a crucial area in which the State must endeavor to reduce carbon emissions in tackling problems of climate change. Therefore, the Government has formulated a series of policies and regulations to promote energy conservation and emission reduction in the field of transportation. The Ministry of Transport and the Ministry of Finance jointly promulgated the *Interim Measures for the Administration of Special Funds for Energy Conservation and Emission Reduction in Transportation* to define specific provisions on the scope, application, review, appropriation, supervision and administration of the special funds. Thanks to the support of national fiscal and tax policy, a large number of projects have benefited from the national subsidies. In February 2011, the Ministry of Transport issued the *Guiding Opinions on the Establishment of Low-carbon Transportation System*, and the *Work Scheme on the Establishment Pilot Project of Low-carbon Transportation System,* to set forth the objectives of and define various key tasks for establishing a low-carbon transportation system. Furthermore, the Ministry of Transport also issued the *Circular on the Overall Implementation Promotion Scheme on Energy Conservation and Emission Reduction in Water Transportation during the "Twelfth Five-Year Plan" Period* to specify the guidelines and objectives, and implementation plan for promotion of energy conservation and emission

reduction in the water transportation industry. The specifics include 10 major tasks, 35 detailed tasks, as well as the liable subjects, the completion time and the anticipated result of each task.

4.4.2.5 Policies on Standardization of Road Tolls and Tax Reform for the Transportation Industry

As part of the efforts to implement the "State Nine Guidelines," China's Government issued a series of policies focusing on solving unreasonable charges of road tolls and transport tax system in 2011.

1. Policies for standardization of road tolls

The General Office of the State Council had issued documents concerning problems in road tolls as far back as 2009. However, the improper charge of road tolls has yet been fully resolved over the years. Therefore, in June 2011, the Ministry of Transport, the National Development and Reform Commission and other ministries and commissions jointly promulgated the *Circular on Carrying out Special Clean-up Task of Toll Road*, and made a 1-year arrangement for carrying out the mission nationwide. The *Circular* required rectifying the problems of charging beyond set timeframes, excessive tolls and unreasonable charges. It also required the cancellation of expired projects, the revocation of densely-dotted tollbooths along highways, and the rectification of excessive tolls and other illegal charges in 1 year. Beyond these actions, a long-term mechanism and the policies and measures for strengthening toll road administration would also be formulated through further research.

In accordance with the phased requirements of the Circular on clean-up task of road tolls, all provinces, autonomous regions and municipalities had set up their own special clean-up taskforce. By the end of 2011, 18 provinces and municipalities had cancelled tolls for government-financed Grade II roads and abolished 1,892 tollbooths over 94,000 km of highways, thus achieving an initial success in the clean-up effort.

2. Scheme on transportation tax reform and complimentary policies

With the rapid development of logistics industry and the continual expansion of the service functions of logistics enterprises, the problems of unreasonable taxation such as double imposition of business tax for logistics enterprises had become increasingly evident, and been a big impediment to the expansion for logistics enterprises. In November 2011, the Ministry of Finance and the State Administration of Taxation jointly promulgated the *Notice on Issuing the Pilot Plan for Levying Value Added Tax in Lieu of Business Tax,* aiming at reducing inappropriate tax burdens of relevant enterprises. Before the reform, logistics enterprises were subject to business tax based on the revenue of all enterprises involved in all layers of operations. This tended to result in serious problems of double taxation. Upon changing to the system of value added tax, the enterprises would pay taxes only for the value added part after deduction of expenses from outsourced intermediate operations.

To implement the *Pilot Plan*, in November 2011, the Ministry of Finance and the State Administration of Taxation jointly issued the *Notice on Carrying out the Pilot Practice of Levying Value Added Tax in Lieu of Business Tax on the Transportation Industry and Some Modern Service Industries in Shanghai*, beginning from January 1, 2012. Afterwards, the Ministry of Finance and the State Administration of Taxation continued to issue a series of documents to supplement the initial policies.

4.4.2.6 Promotion of Construction of Electronic Transport Ports

The informatization of transport ports is an important part of the construction of modern transport system. To promote this work, in August 2011, the General Office of the Ministry of Transport issued the *Notice on Expediting the Establishment of Nationwide Public Information Service Platform for Electronic Transport Ports.* The Notice covered the objectives, the main contents and functions, the implementation steps and the guarantee measures for the construction of the platform. Based on the Notice, the General Office of the Ministry of Transport and the General Office of AQSIQ together issued the *Notice on Jointly Promoting the Establishment of Electronic Ports* to jointly establish the information sharing platform and mechanism, to build a sound electronic gate administration mode, and to promote the construction of electronic ports.

4.4.3 Diverse Policies on Internet of Things and E-commerce Logistics Infrastructure

4.4.3.1 Establishment of Public Information Platform Included in Funding Projects of Internet of Things

In 2011, relevant departments of the Government issued documents concerning financial support for promoting the sound and rapid development of Internet of things and e-commerce. The Ministry of Finance promulgated the *Notice on Issuing the Interim Measures for the Management of Special Funds for the Development of the Internet of Things*. The Ministry of Industry and Information Technology and the Ministry of Finance jointly issued the *Notice on Carrying out the Special Funding Project for the Development of the Internet of Things in 2011*, detailing the responsible authorities, the scope of support, the application, review, supervision and monitoring of funds. As to the mode of funding and support, the *Interim Measures for the Management* specified that free subsidy would be granted for projects on technology R&D of Internet of things, research and formulation of standards, and public service platform, whereas discounted loans would be applicable for projects on the industrialization, application demonstration, and promotion of Internet of things.

4.4.3.2 Construction of Logistics Infrastructure for E-commerce

Along with China's developing economy and the change of its citizens' consumption patterns, e-commerce has become an important emerging strategic industry and modern distribution mode in China. It has witnessed a trend of rapid development in recent years. In October 2011, the Ministry of Commerce issued the *Guiding Opinions on the Development of E-commerce during the "Twelfth Five-year Plan" Period,* and put forward that by 2015, the rate of e-commerce adoption in enterprises above designated size would reach 80 %, the volume of import and export completed through e-commerce would account for over 10 % of the total volume, and online retail sales would reach 9 % of the total retail sales of consumer goods.

To further promote the sound and rapid development of e-commerce, the National Development and Reform Commission, the Ministry of Commerce and other three ministries jointly promulgated the *Guiding Opinions on Founding of National E-commerce Demonstration City*, dictating that the five ministries would jointly fund the demonstration cities. They would concertedly develop modern logistics, support the modernization of logistics, warehousing and other infrastructures, and establish a public information service platform for small and medium-sized companies. In August 2011, the Ministry of Commerce issued the *Notice on the List of E-commerce Demonstration Enterprises,* in which a list of selected demonstration enterprises, including some logistics enterprises, was published.

4.5 Issuance of Special Logistics Plans and Regional Plans

Defining the development policies for industries, regions and professions through central planning is an important mode of implementing macro-control by the Chinese Government. In 2011, China issued the *Special Planning for the Development of Commerce Logistics,* the *Twelfth Five-Year Plan for Service Trade*, and the Twelfth Five-Year Plan for some transportation sectors and the economic development plans for certain major regions. These plans play a vital role in the development of professional and regional logistics.

4.5.1 Special Plans for Circulation Field

Commerce logistics is an important part of the logistics field and covers the logistics activities in the field of circulation of food, pharmaceuticals, agricultural products, and production materials. Over the years, responsible administrative bodies continually issued many policies and plans to guide, support and standardize

logistics operations in the field of commercial circulation. These policies and plans have played a pivotal role in promoting the modernization of the circulation field. In March 2011, the *Special Planning for the Development of Commerce Logistics* jointly formulated by the Ministry of Commerce, the National Development and Reform Commission and All China Federation of Supply and Marketing Cooperatives (ACFSMC) was issued and it was part of the complementary plans for the *Adjustment and Development Plan of Logistics Industry,* and also an important industrial plan. This *Plan* puts forward the development objectives of commerce logistics during the "Twelfth Five-Year Plan" period and defines nine major tasks, including improving network layout, strengthening infrastructure construction, realizing services integration, encouraging innovations, improving emergency logistics operational mechanisms, and promoting international cooperation.

To carry out the *Special Planning for Development of Commerce Logistics,* in December 2011, the Ministry of Commerce issued the *Guiding Opinions on Promoting the Circulation Modernization of Production Materials during the "Twelfth Five-year Plan" Period*, with the intent of supporting enterprises to build logistics parks for production materials. It also encouraged enterprises to extend from singular function towards multiple functions, such as exhibition, warehousing, trading, processing, and distribution, so as to establish some professional and comprehensive multi-purpose logistics distribution centers of production materials.

Meanwhile, the Ministry of Commerce also published the *Outline for Development Program of National Pharmaceutical Circulation Industry*, to put forward development issues such as promoting the development of modern pharmaceutical logistics through informatization, transforming traditional pharmaceutical logistics mode through means of modern science and technology, and advancing the professional development of pharmaceutical logistics services.

4.5.2 Inclusion of Logistics Services in the Twelfth Five-Year Plan for Development of Service Trade

In September 2011, the Ministry of Commerce, the National Development and Reform Commission and 32 other ministries and commissions jointly issued the *Outline of Twelfth Five-Year Plan for Development of Service Trade*. According to the *Plan*, 30 fields are chosen as the kernels of development during the "Twelfth Five-Year Plan" period; many items in the field of transport logistics were included as priority issues. The specific services included seven categories as: ocean transportation, air transportation, railway transportation, highway transportation, freight forwarding, post and express, and distribution. This *Plan* provides an opportunity for China's logistics enterprises to develop overseas and improve their level of international services.

4.5.3 Regional Plans on the Construction of Inter-Regional Comprehensive Traffic Channels

For furthering the overall strategy of regional economy development, in 2011, China successively issued plans for developing the Eastern, Central and Western Regions, encompassing domestic, international and inter-regional cooperation. Meanwhile, relevant plans also defined development tenets and specific requirements in building sound regional and inter-regional comprehensive transportation system and modern logistics service system, developing modern logistics industry, and establishing international logistics channel.

4.5.3.1 Establishing Regional Cooperation Demonstration Zones

In June 2011, the State Council approved the *Overall Scheme on Construction of National Eastern*, *Central, and Western Regional Cooperation Zones,* which stated the Council's opinions on constructing a comprehensive transportation channel connecting the Central and Western Regions with Lianyungang as the marine outfall. The State designated Lianyungang as a demonstration zone and provided support through fiscal and investment policies, land policy, opening-up policy, and finance policy. The National Development and Reform Commission formulated corresponding implementation programs in response to the State Council's directives.

4.5.3.2 Accelerating the Development of Coastal Areas of Hebei

In November 2011, the State Council issued the *Development Plan for Coastal Areas of Hebei* to set forth the development objectives of establishing the comprehensive transportation channel for this region and the Pan-Bohai area. This *Plan* aims at increasing the overall economic strength of Pan-Bohai areas and promoting the interaction and coordinated development of these areas with the adjacent regions like Liaoning Coastal Economic Zone and Tianjin Binhai New Area.

4.5.3.3 Accelerating the Construction of Central Plains Economic Region and Chengdu-Chongqing Economic Zone

To speed up the development of the Central and Western Regions, in 2011, the State Council issued the *Guiding Opinions on Supporting Henan Province to Accelerate the Construction of Central Plains Economic Region* and the *Response to the Chengdu-Chongqing Economic Zone Regional Planning*. Henan Province is the economic center and transport hub of the Central Region in China and Chengdu-Chongqing region is an important hub connecting the Southwest Region. Both

regions are of strategic importance in China's economic development, so the State Council elevated their development plans to the national strategic level.

The State Council dictated that immediate actions be taken for the two regions as follows: accelerating the construction of transportation infrastructure in the region, establishing a convenient and efficient comprehensive transportation network, reinforcing traffic links between the region and the coastal regions and its surrounding economic regions, and setting up the transport and logistics systems which could interconnect, intercommunicate and interact with the Eastern Region. Furthermore, the Council also called for strengthening the construction of logistics parks centering on the key cities of the region and cultivating a group of large-sized modern logistics enterprises with high service level and high international competitiveness.

4.5.3.4 Building Yunnan Province as a Bridgehead to the Southwest Region

In May 2011, the State Council issued the *Opinions on Accelerating Yunnan Province to Open to the Southwest Region as an Important Bridgehead* and planned to establish a comprehensive transportation system in this region. Since Yunnan is located on the southern border of China, it is mandatory to accelerate the infrastructure conditions of cross-border traffic, ports, border crossings, as well as the construction of electronic ports. The *Opinions* also required Yunnan Province to focus on improving the conditions of its railway transportation, air transportation and inland water transportation, to collaborate with the Southwest Region for opening up to Southeast Asia and South Asia, and to build Kunming into a national logistics nodal city and an international logistics center for the region.

4.6 Summary

Upon a recap of the formation of China's logistics policy system, this chapter begins with a brief introduction to the recent development and key contents of China's logistics policies. Subsequently it presents a more detailed description of the contents, issuance and implementation of major policies and plans of China's logistics development, and a more detailed discussion of their impacts on logistics development at the present stage and in the future.

Chapter 5
Logistics Development of Pearl River Delta

Ya Xu

Pearl River Delta (Pearl River Delta is located in the south central part of Guangdong Province and comprises nine cities, Guangzhou, Shenzhen, Zhuhai, Foshan, Jiangmen, Dongguan, Zhongshan, Huizhou and Zhaoqing, with a total area of 41,698 km^2) is China's first region where the "reform and opening-up" policy was implemented in 1979. Many governmental policy measures were initially launched in this region, and brought in a rapid development of its economy and changes in the society. The region's progressive experience has played a demonstration role on economic development in China. In recent years, Pearl River Delta has actively promoted the transformation of its economic structure and developmental method, which has put forth new requirements on the region's logistics development.

This chapter comprises three sections. The first section describes the economic development of Pearl River Delta, as indicated by its regional GDP, industrial value added, total retail sales of consumer goods, total value of import and export, and industrial structure. The second section introduces the logistics market and policy environment and the characteristics of logistics development of Pearl River Delta. The third section discusses the port logistics in Pearl River Delta, including the basic status and development characteristics of its port cluster.

5.1 Overview of Economic Development of Pearl River Delta

Since 1989 onward, Guangdong Province has achieved the highest GDP in China. Pearl River Delta is the engine for economic development of Guangdong Province. From 2006 to 2010, Pearl River Delta had generally maintained a fairly rapid economic growth. In 2011, the industrial structure of Pearl River Delta was further optimized;

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Fig. 5.1 Location map of Pearl River Delta

regional GDP, industrial value added and other major economic indexes of the region ranked ahead of all other provinces, and the region's comprehensive economic strength was boosted even further. Location map of Pearl River Delta is shown in Fig. 5.1.

5.1.1 Regional GDP

From 2006 to 2010, the annual average growth rate of regional GDP of Pearl River Delta reached 15.4 %.[1] In 2011, regional GDP of the Delta was 4,396.61 billion RMB, accounting for over 80 % of the regional GDP of Guangdong Province and 9.3 % of the national GDP. Guangzhou, Shenzhen and Foshan were the top three among all nine cities in terms of GDP, as shown in Table 5.1.

5.1.2 Industrial Value Added

From 2006 to 2010, the annual average growth rate of industrial value added of Pearl River Delta was 15.7 %. In 2011, the industrial value added of the Delta accounted for 81.3 % of that of Guangdong Province and 10.5 % of the national one.

[1] Unless otherwise specified, the growth rate of Pearl River Delta cited in this chapter is the nominal growth rate, and that of all cities is the actual growth rate.

Table 5.1 Regional GDP and growth rate of Pearl River Delta for 2006–2011

City	2006		2007		2008		2009		2010		2011	
	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)
Guangzhou	606.84	14.7	705.08	14.5	821.58	12.3	911.28	11.5	1,060.45	13.0	1,230.31	11.0
Zhuhai	74.96	16.1	88.68	16.5	99.21	9.0	103.77	6.6	120.26	12.8	140.32	11.3
Zhongshan	103.60	16.7	121.07	14.7	140.85	10.5	156.44	10.2	182.63	13.5	219.08	13.0
Huizhou	93.32	16.3	110.50	17.4	129.04	11.5	141.47	13.2	172.99	18.0	209.73	14.6
Dongguan	262.46	19	315.10	18.1	370.25	14.0	376.33	5.3	424.63	10.3	473.54	8.0
Shenzhen	568.44	15	676.54	14.7	780.65	12.1	820.12	10.7	951.09	12.0	1,150.21	10.0
Jiangmen	92.10	15.3	109.53	15.0	128.06	10.8	135.53	10.8	155.04	14.3	183.06	13.0
Zhaoqing	52.62	14.5	61.66	15.3	71.59	14.2	84.63	13.6	106.59	17.1	132.33	14.7
Foshan	292.67	19.3	358.85	19.2	433.33	15.2	481.45	13.5	565.15	14.3	658.03	12.1
Pearl River Delta	2,147.01	17.5	2,547.01	18.6	2,974.56	16.8	3,211.02	7.9	3,738.83	16.4	4,396.61	17.6

Note: Growth rate of Pearl River Delta is nominal growth rate; that of the individual cities is actual growth rate

Source: Compiled and calculated from the *China Statistical Bulletin of National Economic and Social Development* of Guangzhou City, Zhuhai City, Zhongshan City, Shenzhen City, Jiangmen City, Zhaoqing City, Huizhou City, Dongguan City and Foshan City (2006–2011) and the *Guangdong Statistical Yearbook (2011)*

The sum of industrial value added of its top three cities (Shenzhen, Guangzhou and Foshan) accounted for 67.4 % of that of the Delta. Owing to factors of industrial transfer, decelerated overseas market demand, and rise in raw material and labor cost, the growth rates of industrial value added of all the cities declined as compared with those in 2010. Most significantly, the growth rate of industrial value added of Dongguan, basing on processing and manufacturing, had declined from 19 % in 2010 to 7.5 %, as shown in Table 5.2.

5.1.3 Total Retail Sales of Consumer Goods

From 2006 to 2010, Pearl River Delta witnessed a rapid growth in total retail sales of consumer goods, with an annual average growth rate of 17.2 %. In 2011, total retail sales of consumer goods of Pearl River Delta reached 1,511.92 billion RMB; wherein, Guangzhou and Shenzhen had the total retail sales of consumer goods respectively of 524.30 billion RMB and 352.09 billion RMB, accounting in total for 58 % of that of the Delta. Total retail sales of consumer goods and the growth rate of Pearl River Delta for 2006–2011 are shown in Table 5.3.

5.1.4 Total Value of Import and Export

Pearl River Delta is China's first region developed under the "opening–up" policy. From 2006 to 2010, its total value of import and export had attained an annual average growth rate of 13.8 %. Owing to the global financial crisis, the growth rate of total value of import and export dropped substantially in 2008, and turned negative in 2009. Along with the turnaround of world economy, total value of import and export of this region bounced back swiftly in 2010 with a growth rate of 28.4 %. In 2011, total value of import and export of the Delta was 874.44 billion USD, with the growth rate of 16.4 % as compared to that in 2010. This value accounted for 95.7 % of the total value of import and export of Guangdong Province and 24.0 % of the national total. Wherein, total value of import and export of Shenzhen accounted for 47.4 % of the Delta's total, as shown in Table 5.4.

5.1.5 Industrial Development

Pearl River Delta is an important manufacturing base of China; its competitive industries are of export-oriented type comprising household appliances, textile and apparel, and electronic information Industries. Wherein, the household appliances industry is foremost in China, including a host of highly competitive enterprises such as GREE, Midea, TCL, etc. The electronic information industry in this region has formed an industrial belt comprising Shenzhen, Guangzhou, Dongguan Huizhou, Foshan and Zhongshan cities, and is very competitive in the international market in fields like communications equipment, electronic device and software.

Table 5.2 Industrial value added and growth rate of Pearl River Delta for 2006–2011

City	2006		2007		2008		2009		2010		2011	
	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)	Gross value (billion RMB)	Growth rate (%)
Guangzhou	221.04	17.4	260.02	17.0	295.66	11.7	310.68	9.0	359.33	12.5	409.61	11.5
Zhuhai	38.99	22.6	47.19	20.1	50.94	8.9	49.95	1.2	61.6	18.1	73.63	14.8
Zhongshan	60.59	17.6	70.37	13.9	81.19	10.1	86.48	9.1	102.15	16.3	116.46	14.2
Huizhou	36.93	30.2	50.25	21.7	52.83	12.2	67.48	19.2	82.61	27.4	101.27	20.2
Dongguan	145.77	22.4	171.79	15.8	187.18	7.1	169.02	–4.0	181.29	19.0	179.73	7.5
Shenzhen	285.81	17.3	327.01	15.1	361.83	12.4	359.76	8.6	423.32	13.9	522.88	12.6
Jiangmen	41.06	21.8	52.06	20.7	70.88	15.5	74.51	11.0	82.97	23.7	113.05	19.1
Zhaoqing	14.20	33.7	18.96	33.5	25.96	26.5	27.75	22.7	40.82	33.7	57.44	27.9
Foshan	179.50	23.4	215.00	24.8	274.31	18.1	292.44	12.5	356.29	17.8	395.82	14.8
Pearl River Delta	1,023.89	23.4	1,212.65	18.4	1,400.78	15.5	1,438.07	2.7	1,690.38	17.5	1,969.89	16.5

Note: (1) Industrial value added of Huizhou (2006–2011), Jiangmen (2007, 2010, 2011), Dongguan (2010, 2011), Foshan (2007, 2011), Zhaoqing (2009, 2011) and Shenzhen (2011) is for enterprises above designated scale, which are enterprises with annual main business income over five million RMB
(2) Growth rate of Pearl River Delta is nominal growth rate; that of the individual cities is actual growth rate
Source: Compiled and calculated from the *China Statistical Bulletin of National Economic and Social Development* of *Guangzhou City, Zhuhai City, Zhongshan City, Shenzhen City, Jiangmen City, Zhaoqing City, Foshan City, Huizhou City and Dongguan City (2006–2011)*, and the *2011 Economy Report of Dongguan* published by Bureau of Statistics of Dongguan

Table 5.3 Total retail sales of consumer goods and growth rate of Pearl River Delta for 2006–2011

City	2006		2007		2008		2009		2010		2011	
	Total retail sales (billion RMB)	Growth rate (%)	Total retail sales (billion RMB)	Growth rate (%)	Total retail sales (billion RMB)	Growth rate (%)	Total retail sales (billion RMB)	Growth rate (%)	Total retail sales (billion RMB)	Growth rate (%)	Total retail sales (billion RMB)	Growth rate (%)
Guangzhou	183.34	14.8	259.50	18.9	314.01	21.0	364.78	16.2	447.64	24.2	524.30	17.1
Zhuhai	25.55	16.1	30.15	18.0	35.97	19.3	41.38	15.0	48.60	20.5	56.79	18.1
Zhongshan	33.11	19.7	39.57	19.5	47.70	20.5	55.48	16.3	64.81	18.2	75.61	16.9
Huizhou	29.72	18.2	35.39	19.1	42.34	19.6	49.11	15.1	58.25	19.0	68.47	18.2
Dongguan	58.45	16.9	69.59	19.0	83.82	20.5	95.63	14.1	110.81	15.9	126.63	15.0
Shenzhen	167.13	16.2	191.50	14.6	225.18	17.6	259.87	15.4	300.08	17.2	352.09	17.8
Jiangmen	35.23	13.7	40.95	16.2	48.3	19.5	57.43	17.4	65.59	17.0	75.92	16.7
Zhaoqing	16.79	18.0	19.68	17.2	23.38	18.8	27.58	15.6	33.29	21.1	38.97	19.3
Foshan	77.62	19.8	94.68	22.0	117.78	24.4	142.91	21.3	168.71	20.1	193.14	18.1
Pearl River Delta	626.94	6.6	781.01	24.6	890.18	14.0	1,094.17	22.9	1,297.78	18.6	1,511.92	16.5

Note: Growth rate of Pearl River Delta is nominal growth rate, and that of all cities is actual growth rate

Source*:* Compiled and calculated from the *China Statistical Bulletin of National Economic and* Social *Development of Guangzhou City, Zhuhai City, Zhongshan City, Shenzhen City, Jiangmen City, Zhaoqing City, Huizhou City, Dongguan City and Foshan City (2006–2011)*

Table 5.4 Total value of import and export and growth rate of Pearl River Delta for 2006–2011

City	2006		2007		2008		2009		2010		2011	
	Total value (billion USD)	Growth rate (%)	Total value (billion USD)	Growth rate (%)	Total value (billion USD)	Growth rate (%)	Total value (billion USD)	Growth rate (%)	Total value (billion USD)	Growth rate (%)	Total value (billion USD)	Growth rate (%)
Guangzhou	63.77	19.2	73.49	15.2	81.95	11.5	76.74	−6.4	103.78	35.3	116.17	12.0
Zhuhai	32.82	27.6	39.87	21.5	46.84	17.5	37.44	−20.1	43.48	16.1	51.64	18.8
Zhongshan	23.13	23.4	24.66	6.6	25.91	5.1	24.47	−5.6	31.12	27.2	34.20	9.9
Huizhou	21.23	11.6	24.12	13.6	29.74	23.4	29.24	−1.7	34.23	17.1	38.81	13.4
Dongguan	84.22	13.2	106.87	26.9	113.30	6.1	94.16	−17.0	121.34	28.8	135.22	11.2
Shenzhen	237.41	29.9	287.53	21.1	299.96	4.3	270.16	−10.4	346.75	28.4	414.10	19.4
Jiangmen	10.82	19.5	12.30	14.0	13.16	7.0	11.04	−16.0	14.34	29.9	17.69	23.4
Zhaoqing	2.79	28.0	3.42	22.8	3.81	11.4	3.38	−7.8	4.39	34.5	5.71	30.1
Foshan	30.98	20.5	37.85	22.2	42.21	11.5	38.34	−9.2	51.66	34.7	60.90	17.9
Pearl River Delta	507.17	23.4	610.11	20.3	656.88	7.7	584.97	−10.9	751.09	28.4	874.44	16.4

Note: Growth rate of Pearl River Delta is nominal growth rate, and that of all cities is actual growth rate

Source: Compiled and calculated from the *China Statistical Bulletin of National Economic and Social Development* of *Guangzhou City, Zhuhai City, Zhongshan City, Shenzhen City, Jiangmen City, Zhaoqing City, Huizhou City, Dongguan City and Foshan City (2006–2011)*

Table 5.5 Leading industries in different cities of Pearl River Delta

City	Leading industry
Guangzhou	Automobile making, electronic information, petrochemical
Zhuhai	Electronic information, bio-medicine, petrochemical, household appliances, instrument making, electrical energy
Zhongshan	Electrical machinery and equipment, metal work, chemical, electronic information, textile and apparel
Huizhou	Petrochemical, electronic information, electrical machinery and equipment
Dongguan	Electronic information, electrical machinery and equipment, textile and apparel, food and beverage, papermaking and paper products
Shenzhen	Electronic information, bio-medicine, logistics, financial, culture
Jiangmen	Electrical machinery and equipment, textile and apparel, electronic information, papermaking and paper products, food and beverage, building materials
Zhaoqing	Electronic information, electrical machinery and equipment, petrochemical, textile and apparel, food and beverage, building materials, forestry, papermaking, bio-medicine, automobile and motorcycle manufacturing
Foshan	Electronic information, household appliances, plastic products, food and beverage

Bio-medicine, new energy and other high-tech industries had also developed rapidly in the Delta. In 2011, the value added of high-tech industry of Shenzhen was 373.8 billion RMB, increased by 22.2 % year-on-year. Wherein, the value added of bio-medicine industry was 17.5 billion RMB, increased by 24 % year-on-year; that of the Internet was 138.1 billion RMB, a year-on-year rise of 18.9 %; that of the new energy industry was 25.4 billion RMB, a year-on-year increase of 20.7 %. In the same year, for Guangzhou, the value added was increased by 15.5 % in high-tech manufacturing industry; of which 15.3 % was in medicine manufacturing, 17.5 % was in aerospace and aircraft manufacturing, 17.9 % was in electronic and communication equipment manufacturing, 10.2 % was in electronic computer and office equipment manufacturing, and 10.8 % was in medical equipment, instrument and meter manufacturing.

The industrial structure of Pearl River Delta is being optimized continuously in recent years, and distinctively competitive industries are being formed in all cities. Leading industries in different cities of the Delta are shown in Table 5.5.

5.2 Main Characteristics of Logistics Development of Pearl River Delta

5.2.1 Scale of Logistics Market

In 2010, the value added of the transportation, storage and post service sectors of Pearl River Delta was 158.71 billion RMB, accounting for 8.37 % of the national total. Wherein, Guangzhou has the highest proportion of the value added of the

Table 5.6 Value added and growth rate of the transportation, storage, and post service sectors for Pearl River Delta in 2010

City	Value added (billion RMB)	Growth rate (%)	Proportion in the city's GDP (%)
Guangzhou	74.67	12.0	7.04
Zhuhai	2.54	5.3	2.11
Zhongshan	3.62	7.6	1.98
Huizhou	6.35	9.4	3.67
Dongguan	8.11	1.4	1.91
Shenzhen	37.99	20.6	3.99
Jiangmen	6.40	20.5	4.13
Zhaoqing	3.37	13.4	3.16
Foshan	15.67	11.8	2.77
Pearl River Delta	158.71	—	4.21

Source: Compiled from the *China Statistical Bulletin of National Economic and Social Development of Guangzhou City, Zhuhai City, Zhongshan City, Shenzhen City, Dongguan City, Jiangmen City and Zhaoqing City (2011)* and the *Guangdong Statistical Yearbook (2011)*

transportation, storage and post service sectors in the city's GDP at 7.04 %. The growth rates of Shenzhen and Jiangmen exceeded 20 %, showing the fastest growth. Detailed value added of the transportation, storage and post service sectors of different cities in 2010 is shown in Table 5.6.

In 2010, the volume of freight and freight turnover in Pearl River Delta were 1.61 billion tons and 499.7 billion ton-kilometers, with growth rates of 13.0 % and 19.5 %, respectively. Figures 5.2 and 5.3 show the details.

From 2006 to 2010, the growth rate of cargo throughput of ports in Pearl River Delta dropped at first and then rose back up. Affected by the international financial crisis, cargo throughput of ports showed a negative growth in 2008, and then rose slightly in 2009. In 2010, cargo throughput of ports increased substantially with a growth rate of 19.8 % and reached 974 million tons; wherein, the cargo throughput of Guangzhou Port surpassed 400 million tons for the first time. Cargo throughput of ports in all cities of the Delta and corresponding growth rate from 2006 to 2010 are shown in Table 5.7.

Pearl River Delta is one of the regions with the most developed air cargo transport in China. It has two key cargo airports, Guangzhou Baiyun International Airport and Shenzhen Bao'an International Airport, where many international logistics enterprises established their airfreight centers. For example, in 2009, FedEx Asia-Pacific Transit Center was set up in Guangzhou Baiyun International Airport; in 2010, UPS Asia-Pacific Transit Center was founded in Shenzhen Bao'an International Airport. In 2011, the throughput of Guangzhou Airport and Shenzhen Airport ranked the third and the fourth respectively in China. Throughput and growth rate of Guangzhou Airport and Shenzhen Airport from 2008 to 2011 are shown in Table 5.8.

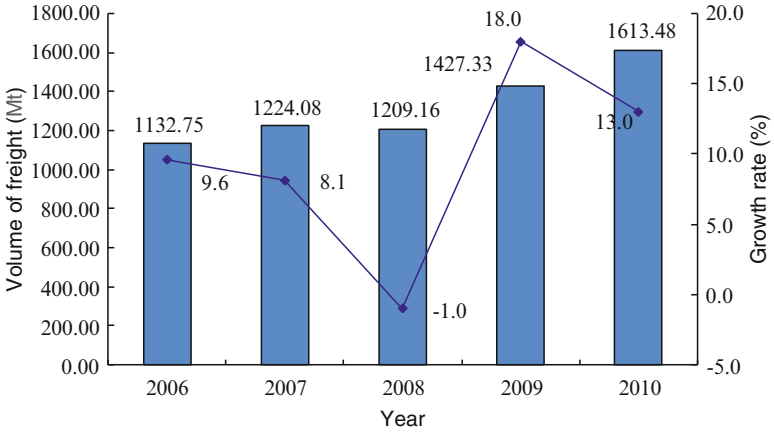

Fig. 5.2 Freight volume and growth rate of Pearl River Delta for 2006–2010 (Source*:* Compiled from the *Guangdong Statistical Yearbook (2011)*, published by the Statistics Bureau of Guangdong Province)

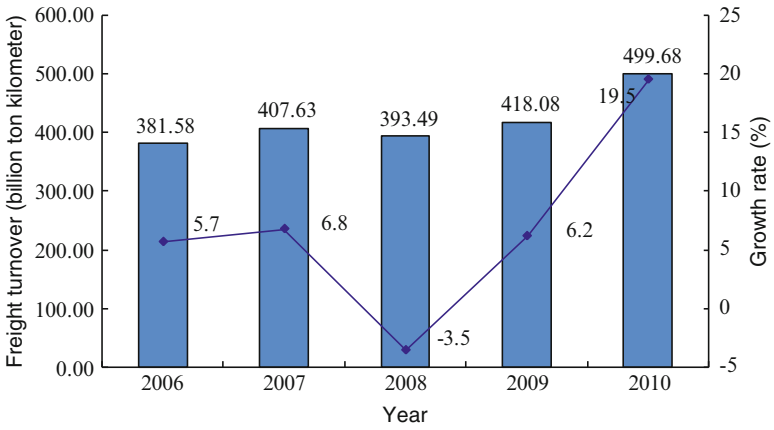

Fig. 5.3 Freight turnover and growth rate of Pearl River Delta for 2006–2010 (Source*:* Compiled from the *Guangdong Statistical Yearbook (2011)*, published by the Statistics Bureau of Guangdong Province)

5.2.2 Transportation Infrastructure

Pearl River Delta has a relatively well-developed comprehensive transportation system. In terms of highway infrastructure, a transportation network of expressways centered in Guangzhou has been formed in the Delta. From 2006 to 2010, the accumulated investment in expressway in Guangdong Province was 150 billion RMB, representing 2.3 times the investment from 2001 to 2005; about 1,700 km of expressway were added, connecting Guangdong with each of its adjacent province through at least two expressways.

Table 5.7 Throughputs of ports in all cities of Pearl River Delta and corresponding growth rate for 2006–2010

City	2006		2007		2008		2009		2010	
	Throughput (Mt)	Growth rate (%)	Throughput (Mt)	Growth rate (%)	Throughput (Mt)	Growth rate (%)	Throughput (Mt)	Growth rate (%)	Throughput (Mt)	Growth rate (%)
Guangzhou	328.16	20.3	369.00	12.3	346.78	1.0	363.86	4.9	409.59	12.5
Zhuhai	35.61	0.1	37.13	4.3	40.86	10.1	44.07	7.8	60.56	37.4
Zhongshan	23.26	12.3	27.52	18.2	27.56	0.1	34.02	23.4	47.05	40.7
Huizhou	20.82	37.5	23.24	11.6	25.83	11.1	38.11	47.5	46.73	22.6
Dongguan	19.51	−14.4	20.17	3.4	32.08	59.1	35.30	10.0	56.57	60.3
Shenzhen	175.98	14.6	199.94	13.6	211.25	6.1	193.65	−8.3	220.98	14.1
Jiangmen	33.18	36.1	40.33	21.5	25.88	1.6	41.70	3.6	49.65	19.1
Zhaoqing	5.93	14.2	7.66	29.2	9.15	19.4	11.29	23.5	28.76	8.7
Foshan	44.17	11.8	49.85	12.9	51.55	3.4	50.99	−1.1	54.10	6.1
Total	686.62	16.4	774.84	12.8	770.94	−0.5	812.99	5.5	973.99	19.8

Note: Growth rate of Pearl River Delta and that of all cities in 2006 are nominal growth rate

Source: Compiled from the *China Statistical Bulletin of National Economic and Social Development* of *Guangzhou City, Zhuhai City, Zhongshan City, Shenzhen City, Dongguan City, Jiangmen City and Zhaoqing City (2007–2010)*, and the *Guangdong Statistical Yearbook (2008)*

Table 5.8 Throughput and growth rate of Guangzhou airport and Shenzhen airport for 2008–2011

	2008		2009		2010		2011	
City/Airport	Throughput (K-tons)	Growth rate (%)	Throughput (K-tons)	Growth rate (%)	Throughput (K-tons)	Growth rate (%)	Throughput (K-tons)	Growth rate (%)
Guangzhou/Baiyun Airport	686	−1.3	955	39.3	1,144	19.8	1,180	3.1
Shenzhen/Bao'an Airport	598	−2.9	605	1.2	809	33.7	828	2.4

Source: Compiled from the *Statistical Bulletin of Nationwide Airports (2008–2011)*, published by the Civil Aviation Administration of China

As for railway construction, Pearl River Delta has established a railway framework with Guangzhou as the center, Beijing-Guangzhou Railway and Beijing-Hong Kong Kowloon Railway as the main arteries. Beijing-Guangzhou Railway and Beijing-Hong Kong Kowloon Railway are two main railways crossing China from south to north, and connecting numerous provincial capitals. Furthermore, the construction of railways for Zhuhai Port, Guangzhou Port is being accelerated, which will further improve the Delta's disseminating capability and the receiving/distributing capability of the ports.

Pearl River Delta belongs to the Pearl River system[2] and is one of the regions with the most developed water transportation in China. By the end of 2010, Guangdong Province had about 800 km of thousand-ton grade water channels and more than 2,900 coastal and inland port berths, with an annual throughput exceeding one billion tons. The port cluster with Guangzhou and Shenzhen as the core is the important strategic resource for the Delta's logistics development. In 2011, container throughput of Shenzhen Port and Guangzhou Port ranked, respectively, fourth and seventh in the world, and the total cargo throughput of Guangzhou Port ranked fourth in China. These business activities contributed significantly to the promotion of economic development of Pearl River Delta.

Pearl River Delta possesses two large airports, the Guangzhou Baiyun International Airport and the Shenzhen Bao'an International Airport. Guangzhou Baiyun International Airport has the highest volume of freight in Pearl River Delta. The Baiyun Airport FedEx Asia-Pacific Transit Center began operation in 2009; it has a designed average daily express throughput of 179,000 pieces, an average daily sorting volume of 125,000 pieces, and a peak sorting capacity of 27,000 pieces per hour. During the "Twelfth Five-year Plan" period, about 20 billion RMB will be invested by Baiyun Airport to construct a third runway to further solidify its hub position. In recent years, Shenzhen Bao'an International Airport has achieved a steady development in freight service. In 2011, Shenzhen Bao'an Airport was awarded "The Best Freight Airport of the Year" by the *Air Cargo News*—a world prestigious journal of airfreight, with freight volume ranked 24th in the world. Lufthansa Cargo AG, UPS Asia Transit Center and FedEx have successively settled in Shenzhen Bao'an Airport. The UPS Asia Transit Center, put into operation in 2010, has a sorting and handling capacity of 18,000 pieces per hour. In July 2011, the second runway of Shenzhen Bao'an Airport expended a total investment of 21.4 billion RMB was put into use, which further enhanced the infrastructure for airfreight in Shenzhen Airport.

5.2.3 Construction of Logistics Informatization

Construction of logistics informatization in Pearl River Delta is at the forefront in China. In 2011, Guangzhou Logistics Exchange, the first comprehensive exchange institution specializing in highway logistics exchange and basing on informatization

[2] Pearl River has a perennial navigable mileage of 12,000 km, with waterway cargo transport volume ranking second in China, behind that of the Yangtze River.

transaction platform, was established in China. In 2010, the "Southern Modern Logistics Public Information Platform" project with a total investment of 0.8 billion RMB was selected as one of the top 500 projects of modern industry in Guangdong Province. The platform has been used to implement comprehensive collection, storage, analysis, management and control of information on logistics operations, logistics processes, logistics management from public networks and various departments in the pan-Pearl River Delta region.

Pearl River Delta has seen a rapid development of port informatization construction. The e-port functions of Guangzhou are being continually improved. So far, the port administration has realized 100 % Internet connection and 100 % e-port business flow; the ports and airports can provide users with one-stop e-government services. To promote convenient customs clearance between Guangdong and Hong Kong, the two parties had established the first radio frequency identification (RFID) public technology support center in China. In 2011, the Guangdong Province also released multiple local standards regarding RFID, such as the RFID-based logistics clearance data coding standards.

5.2.4 Construction of Logistics Parks and Development of Logistics Enterprises

Logistics parks in Pearl River Delta have been under continuous development, and a host of modern logistics parks had been successively constructed in Baiyun Airport, Bao'an Airport, Guangzhou Port, and Shenzhen Port. In Shenzhen six key logistics parks-Pinghu, Yantian Port, Sungang-Qingshui River, Qianhaiwan, Shenzhen Airport Aviation, and Longhua were constructed and put into operation. In Guangzhou, three international hub logistics parks-Nansha, Huangpu and Guangzhou Airport were constructed; a number of local medium- and large-sized logistics enterprises, including P. G. Logistics and Flourish Logistics, had settled in the parks. In 2011, the ZTY Yantian International Logistics Park was established in Shenzhen, which could attain a seamless connection with the Yantian International Container Terminals. In December 2011, Huitong Logistics Park in Zhuhai Port was put into operation, which could provide powerful support for terminals at Gaolan Port and related enterprises, taking advantage of its adjacency to the Gaolan Port, the Guangzhou-Zhuhai Railway, the Gaolan Port Expressway and other transportation facilities.

Pearl River Delta has attracted a large number of renowned international and domestic logistics enterprises and has formed a diversified development pattern which includes state-owned logistics enterprises, private logistics enterprises and foreign-funded logistics enterprises. By 2010, Guangdong Province had 88 A-level logistics enterprises,[3] 84 of which were distributed in the Delta. Moreover,

[3] A-level logistics enterprise is assessed in accordance with the national standard set in the *Classification and Evaluation Indicators for Logistics Enterprises*, to lead other logistics enterprises develop toward standardization, modernization and scale.

Guangdong Province has four Logistics Demonstration Bases and six Logistics Test Bases in the Delta. UPS, FedEx, TNT, Maersk, DHL and other internationally well-known logistics enterprises have set up service network in the region; UPS and FedEx have established their Asia-Pacific transit centers in Pearl River Delta.

5.2.5 Policies for Logistics Development of Pearl River Delta

In 2008, the State Council passed the *Outline of the Program for Reform and Development of Pearl River Delta (2008–2020)*, which lifted the development of Pearl River Delta to the national strategic level. The *Outline* pointed out that the construction of several hub-type logistics parks such as Baiyun Airport, Bao'an Airport, Guangzhou Port and Shenzhen Port would be promoted, and the infrastructure matching with modern logistics industry would be improved. Furthermore, the *Outline* dictated the construction of South China Logistics Information Exchange Center based in Pearl River Delta to make Guangdong Province the first-rate logistics center in the world.

In 2009, Guangdong Province published the *Planning on Integration of Infrastructure Construction in Pearl River Delta* to accelerate the construction of the integrated regional logistics infrastructure. The *Planning* pointed out that Guangdong would invest 1,976.7 billion RMB from 2009 to 2020 in the overall layout of logistics infrastructure in the Pearl River Delta. This undertaking would strengthen the connection of various transportation modes by enhancing the operations capacity and the receiving-distributing capability of ports, airports, stations and other traffic hubs.

Furthermore, Guangdong Province had actively promoted the cooperation with Hong Kong and Macau in the logistics field. In 2010, Guangdong Province signed the *Framework Agreement on Hong Kong/Guangdong Cooperation* with Hong Kong to jointly promote and establish logistics development exchange mechanism and to optimize the supervision mechanism for direct freight vehicles between Guangdong and Hong Kong. In 2011, Guangdong Province signed the *Framework Agreement on Macau/Guangdong Cooperation* with Macau to cooperate with Macau's enterprises in terms of port logistics, third party logistics and logistics informatization construction in Guangdong.

In addition, all the cities in Pearl River Delta had successively published local logistics policies to vigorously promote logistics development. In 2011, Shenzhen City released the *"Twelfth Five-Year" Plan for Development of Modern Logistics in Shenzhen*, which specified that during the "Twelfth Five-Year Plan" period, high-end logistics in Shenzhen would be developed to the leading level of modern logistics, including cold chain logistics, automobile logistics, e-commerce logistics, supply chain service innovation, etc. In 2009, Guangzhou Government approved the *Program on Acceleration and Promotion of Constructing Guangzhou as Asian Logistics Center* to begin constructing a logistics base with receiving-distributing and disseminating functions for Asian and even global commodities.

5.3 Development of Port Logistics in Pearl River Delta

5.3.1 Port Cluster in Pearl River Delta

The Pearl River Delta port cluster is one of the five port clusters in China. It is composed of more than 60 ports. Among them, Guangzhou Port and Shenzhen Port, two world-class 100-million-ton ports, are the core of this port cluster; Zhuhai, Huizhou, Humen, Zhongshan, Zhaoqing, Foshan and other ports are the backbone of the cluster.

The port cluster in Pearl River Delta consists of six systems: (1) the coal loading/unloading and transfer system composed of public terminals at Guangzhou and other ports as well as terminals of power enterprises; (2) the container transportation system with Guangzhou Port and Shenzhen Port as trunk line ports and Huizhou, Humen, Zhuhai and Zhongshan as feeder ports; (3) the import oil and natural gas loading/unloading and transfer system composed of Guangzhou, Shenzhen, Zhuhai, Huizhou and Humen Ports; (4) the import iron ore transshipment system with Guangzhou and Zhuhai as the main ports; (5) the grain transfer, storage and transportation system composed of Guangzhou Port and Shenzhen Port; (6) the commercial automobile transportation system with Guangzhou as the main port.

The Pearl River Delta port cluster has a vast hinterland, covering provinces in South China and Southwest China. The hinterland can be divided into three levels: the Pearl River Delta Economic Zone as the short-range hinterland, the Eastern Guangdong, Northern Guangdong, Western Guangdong and Eastern Guangxi regions as the mid-range hinterland, and the Pearl River Basin and the regions covered by Beijing-Guangzhou Railway, Beijing-Kowloon Railway and other arterial traffics[4] as the long-range hinterland.

Pearl River Delta is one of the regions with the most developed export-oriented economy in China. Highly developed industries such as electronic information, electrical machinery and textile and apparel, as well as other export-oriented manufacturing provide ample resources for ports in the Delta. In Southwest China and South China, automobile, electrical equipment, machinery, clothes and other manufacturing industries, as well as agriculture are well-developed. Numerous export bases have been established, including National Automobile and Spare Parts Export Base in Guangxi Liuzhou, which also added to the robust development of the port cluster.

5.3.2 Port Infrastructure

All cities of the Pearl River Delta deem the construction of port infrastructure as an important way to enhance their competitiveness; they have further improved the

[4] Cao Xiaoshu and Peng Lingling, "*Port Logistics and City Development in the Pearl River Delta",* the Commercial Press, 2011.

Table 5.9 Statistics of berths at all ports in Pearl River Delta in 2010

Port	Berth length (m)	Number of berths	Annual throughput capacity of berth				
			Ore (K-tons)	Coal (K-tons)	Oil products (K-tons)	Container (thousand TEUs)	Automobile (thousand units)
Guangzhou	18,179	132	1,000	18,000	26,000	7,370	330
Zhuhai	12,390	122	1,820	8,460	26,810	1,390	—
Zhongshan	6,980	120	118	2,103.6	2,588.3	1,600	
Huizhou	9,090	76	—	9,650	72,960	550	—
Humen	14,577	174	—	24,500	15,609	650	—
Shenzhen	29,971	160	—	5,000	12,490	18,910	220
Jiangmen	17,576	299	8,000	10,100	4,200	1,560	0
Zhaoqing	13,035	196	2,000	5,000	1,200	340	—
Foshan	23,942	329	1,260	4,450	19,850	5,780	—

Note: "—"in the table means missing data
Source: Compiled from *the China Ports Statistical Yearbook (2011)*, published by the China Ports Magazine

scale, the depth of berth, the loading/unloading capacity and the supporting facilities at their ports. From 2006 to 2010, Guangzhou Port focused on strengthening the construction of channels, and the container, oil, food, automobile and bulk cargo terminals; it has invested 11 billion RMB in total, set up 15 new deepwater berths and increased the throughput by 0.11 billion tons and 5.73 million TEUs. Statistics of berths at all ports in Pearl River Delta in 2010 are shown in Table 5.9.

5.3.3 Disseminating Capacity of Ports

In the past 5 years, large number of apparel, electronics, household appliances and other traditional manufacturing enterprises moved out of the Pearl River Delta, so the industries in this region have transformed and upgraded toward advanced manufacturing and modern services, which results in the decline in freight volume at all ports in the Delta. Consequently, these ports have actively constructed dry ports in inland regions to strengthen their disseminating capacity. For example, in 2009, Guangzhou Port set up the "Kunming Dry Port" in Kunming. In 2010, Guangdong Province signed a memorandum of understanding with Guizhou to jointly construct a "Dry Port" in Guizhou. Moreover, Guangdong Province also plans to construct "Dry Port" in Changsha, Hengyang and other cities of Hunan Province in the future.

In addition, all ports in the Delta have focused on the development of sea-rail combined transport. For example, in 2008, Shenzhen Yantian International Container Terminals established connection with Southern Jiangxi region through sea-rail combined transport. In 2011, Guangdong Provincial Department of Transport signed the *Cooperation Agreement on Promotion of Sea-Rail Combined Transport Development* with Guangzhou Railway (Group) Corporation to strengthen

the infrastructure construction of sea-rail combined transport for further improvement in the receiving-distributing capability of coal, ores, food, and chemical fertilizer.

5.3.4 Division of Labor and Cooperation of Ports

With increasingly fierce market competition, all ports in the Pearl River Delta have highlighted the division of labor and cooperation among them. With Guangzhou Port and Shenzhen Port as the artery ports, and Foshan, Huizhou and other inland ports as well as Zhuhai and other coastal ports as the feeder ports, they have forged a relationship of interdependency and mutual support.

Shenzhen Port gives priority to foreign trade transport while Guangzhou Port places its emphasis on domestic trade transport. For Shenzhen Port, in 2010, foreign trade throughout of accounted for 77.4 % of the total throughput, and foreign trade container throughput accounted for 95.2 % of the total throughout; whereas for Guangzhou Port, domestic trade throughput and domestic trade container throughput accounted for 78.6 % and 66.9 % of the respective totals.

5.3.5 River-Sea Coordinated Transport

River-sea combined transport in Pearl River Delta has its unique advantage, due to the connection of rivers and the sea, The Pearl River water system connects Yunnan, Guizhou, Guangxi, Guangdong, Hong Kong and Macau. With freight volume below only that of the Yangtze River system, it is an important freight channel in Southwest China and South China.

To draw inland goods through the connection between inland river ports and costal international trunk line ports, Guangzhou and Shenzhen respectively launched the “Shuttle Bus”, the “South China Common Feeder Express” branch liner shipping service. This service network covers all major terminals along the Pearl River, and provides a good basis for the development of river-sea combined transport in Pearl River Delta.

5.3.6 Integration of the Bonded Zone and Port Area

Pearl River Delta actively promotes the linkage of the bonded zone and the port areas, integrating and coordinating the full functions of bonded zone and the geographical advantage of the ports For example, Shenzhen placed the Yantian Port Bonded Zone in Yantian Port Area to integrate the bonded zone and the port in terms of physical location and software and hardware facilities, so as to facilitate the

strict and efficient supervision by the customs. In 2008, the State Council approved the establishment of Guangzhou Nansha Free Trade Port Zone and Shenzhen Qianhaiwan Free Trade Port Zone, which further improved the integration level of the bonded zone and the port area in the Pearl River Delta. Guangzhou Nansha Free Trade Port Zone is the first bonded port officially put into operation in Guangdong Province, forming a mutually supportive relationship of "promoting the port through the bonded zone and prospering the bonded zone through the port." Shenzhen Qianhaiwan Free Trade Port Zone so far has the highest productive value per unit area in China. It has attracted more than 20 well-known international enterprises to settle in, including DHL, Philips, and Carrefour, and formed a modern logistics consolidation site with export mixing center, offshore distribution center and regional/global distribution center.

5.4 Summary

In 2011, Pearl River Delta witnessed a rapid economic growth. Regional GDP, industrial value added, total retail sales of consumer goods, total value of imports and exports and other major economic indexes in the region ranked at the top of the nation, and its comprehensive economic strength was further enhanced. The scale of logistics market in Pearl River Delta was further expanded; transportation infrastructure in this region was improved continually, and a relatively developed comprehensive transportation system had been formed. Logistics informatization construction in the Delta was in the leading position. Moreover, logistics enterprises in the area had developed prosperously. A large number of renowned international and domestic logistics enterprises concentrated in the Delta, and a diverse development pattern including state-owned logistics enterprises, private logistics enterprises and foreign logistics enterprises had taken shape. Port logistics played a leading role in logistics development in this region. Infrastructure at all ports continued to improve, and the ports' disseminating capacity to inland area was strengthened. Meanwhile, division of labor and cooperation were actualized between ports, forming a wholesome competitive and cooperative relationship among them, and providing a powerful assurance for the development of export-oriented economy in Pearl River Delta.

Chapter 6
Logistics Development of Wuhan Metropolitan Cluster

Yong Liu

Wuhan metropolitan cluster (Wuhan metropolitan cluster is also called "1+8" metropolitan cluster, which is located in eastern Hubei Province. It refers to the metropolitan area centered in Wuhan City and composed of eight adjacent cities including Huangshi, Ezhou, Huanggang, Xiaogan, Xianning, Xiantao, Tianmen and Qianjiang, see Fig. 6.1) is an important metropolitan area situated in Central China. It was approved to be the "National comprehensive reform testing zone of resource-conserving and environmental-friendly society" by the State Council in 2007, under the backdrop of the "Emerging Central" regional development strategy. The government mandated the Wuhan metropolitan cluster to blaze a new trail of industrialization and urbanization featuring low resources consumption, less environmental pollution and strong resource-gathering capability. Development of logistics is deemed as conducive to the industrial restructuring of the area and the economic integration within the area, thus accelerating the pace of building it into an economic center in the Central Region.

This chapter contains three sections. The first section summarizes the economic development of the cluster. The second section elaborates on the characteristics of logistics development in Wuhan metropolitan cluster in terms of the scale of its logistics market, its position in China's logistics network, its business logistics development, port logistics of the inland rivers in the area and the regional logistics cooperation. The third section describes the future development trend of Wuhan metropolitan cluster, including its general logistics positioning, direction of logistics development in each city, key industrial logistics and major development areas.

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Fig. 6.1 Map of Hubei province and Wuhan metropolitan cluster

6.1 Overview of Economic Development in Wuhan Metropolitan Cluster

Wuhan metropolitan cluster covers an area of 58,000 km^2, and had 30.24 million permanent residents in 2010, accounting for 31.2 % of the land in Hubei Province and 52.84 % of the province's population. Endowed with a high concentration of industries and production resources and a vibrant economy, Wuhan metropolitan cluster is a core area for the economic development of Hubei Province. Relying on its location and policy advantages, Wuhan metropolitan cluster has attained rapid and steady development since the "Eleventh Five-Year Plan"[1] took effect.

6.1.1 Regional Economic Aggregate

During the "Eleventh Five-Year Plan" period, overall economic development in Wuhan metropolitan cluster maintained a healthy momentum, and the average growth rate of regional GDP was 19.67 %,[2] which was 2.82 % points higher than the

[1] The Chinese Government generally formulates its national economic and social development plan in every five years, and designates it as the "Xth-Year Plan," and the five years are called "Xth Five-Year" period. "The Eleventh Five-Year" refers to year 2006–2010.

[2] Unless otherwise specified, all growth rates in this chapter concerning GDP, total agricultural output value, industrial added value, foreign trade volume of import and export and other indexes are nominal growth rates; that is, the factor of price variation is not taken into consideration in the computation.

Table 6.1 Regional GDP of Wuhan City for 2006–2011

Year	Value (billion RMB)	Nominal growth rate (%)	Proportion in Wuhan metropolitan cluster (%)
2006	267.93	18.49	58.25
2007	320.95	19.79	57.76
2008	411.55	28.23	59.03
2009	462.09	12.28	57.75
2010	556.59	20.45	57.76
2011	675.62	21.38	56.97

Source: Compiled from the *Wuhan Statistical Yearbook (2007–2011)* and relevant data from the *China Statistical Bulletin of National Economic and Social Development of Wuhan (2011)*

national average. In 2010, regional GDP in Wuhan metropolitan cluster reached 963.58 billion RMB, accounting for 60.35 % of the regional GDP of Hubei Province.

Wuhan City is the central city of Wuhan metropolitan cluster, with an economic aggregate exceeding half of that in the cluster. In 2011, the regional GDP of Wuhan City continued its steady growth, reaching 675.62 billion RMB, and registering a growth rate of 21.38 %. GDP data of Wuhan City over recent years are shown in Table 6.1.

6.1.2 Total Industrial Output Value

Wuhan metropolitan cluster, possessing well-developed and wide-ranging industries, is one of China's inland manufacturing bases. During the "Eleventh Five-Year Plan" period, above-the-scale industrial enterprises[3] in the cluster retained a rapid growth, with the average annual growth rate of 29.60 %. In 2010, regional GDP in this area was 1,314.64 billion RMB, increasing by 35.46 % compared to that in 2009.

6.1.3 Total Retail Sales of Social Consumables

Total retail sales of social consumables in Wuhan metropolitan cluster has kept a steady growth, with an average annual growth rate of 19.53 % from 2006 to 2010, reaching 441.42 billion RMB in 2010.

Retail sales of social consumables in Wuhan City exceeded 50 % of the total amount in Wuhan metropolitan cluster. During the "Eleventh Five-Year Plan"

[3] Above-the-scale industrial enterprises refer to industrial enterprises with annual profit from main business reaching five million RMB or more.

Table 6.2 Retail sales of social consumables in Wuhan City and Wuhan metropolitan cluster for 2006–2011

	Wuhan metropolitan cluster		Wuhan City		
Year	Retail sales of social consumables (billion RMB)	Nominal growth rate (%)	Retail sales of social consumables (billion RMB)	Nominal growth rate (%)	Proportion in the metropolitan area (%)
2006	216.56	12.70	129.33	14.60	59.72
2007	255.67	18.06	151.83	17.39	59.39
2008	315.04	23.22	185.01	21.85	58.72
2009	362.91	15.20	216.41	16.97	59.63
2010	441.42	21.63	257.04	18.78	58.23
2011	—	—	295.90	15.12	—

Source: Compiled from the *Wuhan Statistical Yearbook (2006–2011)* and relevant data from the *China Statistical Bulletin of National Economic and Social Development (2006–2011) of each city in Wuhan metropolitan cluster*

Note: "—" means unavailable data due to lack of statistical information for Xiantao, Tianmen and Qianjiang for 2011

period, the average growth rate of retail sales for social consumables in Wuhan City was 18.16 %; in 2011, retail sales for social consumables reached 295.90 billion RMB, increasing by 15.12 % compared to that in 2010 (see Table 6.2).

6.1.4 Total Volume of Import and Export Trade

During the "Eleventh Five-Year Plan" period, total volume of import and export trade in Wuhan metropolitan cluster generally maintained a rapid growth, except for the negative growth in 2009 resulting from the global financial crisis. In 2011, the total volume of import and export trade in this area was 27.20 billion USD, increasing by 28.91 % compared to 2010, as shown in Fig. 6.2.

6.1.5 Industrial Structure

In 2010, added value of the primary, secondary and tertiary industries in Wuhan metropolitan cluster was 95.21 billion RMB, 447.64 billion RMB and 420.63 billion RMB, respectively. During the "Eleventh Five-Year Plan" period, the proportion of primary industry's added value in the total added value gradually declined, while that of the secondary industry increased slightly and that of the tertiary industry kept at a relatively stable level. The ratios of added values of the primary, secondary and tertiary industries changed from 11.77: 44.39: 43.84 in 2006 to 9.88: 46.46: 43.66 in 2010, as shown in Table 6.3.

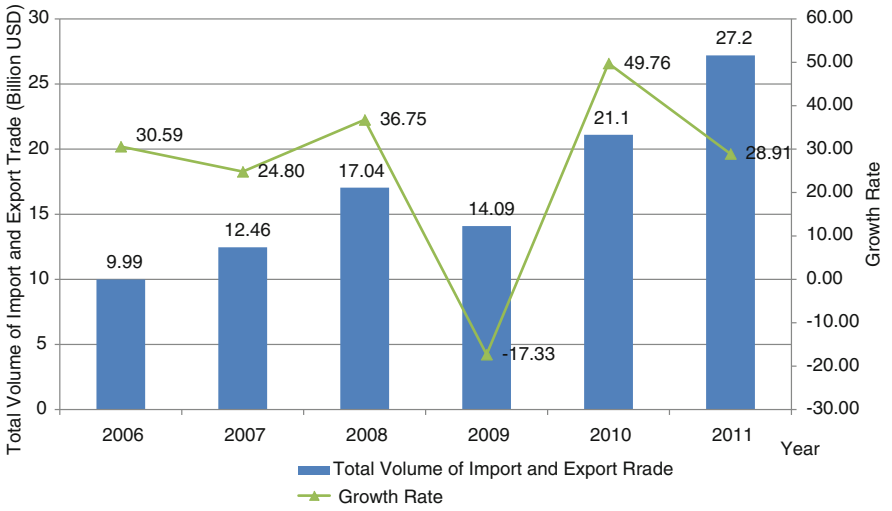

Fig. 6.2 Total volume of import and export trade in Wuhan metropolitan cluster for 2006–2011 (Source: Compiled from the *China Statistical Bulletin of National Economic and Social Development* (2006–2011) of each city in Wuhan metropolitan cluster)

Table 6.3 GDPs and proportions of the three industries in Wuhan metropolitan cluster for 2006–2010

		Primary industry		Secondary industry		Tertiary industry	
Year	Regional GDP in metropolitan cluster (billion RMB)	Added value (billion RMB)	Proportion in regional GDP (%)	Added value (billion RMB)	Proportion in regional GDP (%)	Added value (billion RMB)	Proportion in regional GDP (%)
2006	459.94	54.12	11.77	204.16	44.39	201.66	43.84
2007	555.67	64.03	11.52	247.68	44.57	243.97	43.91
2008	697.21	76.12	10.92	317.20	45.50	303.89	43.59
2009	800.04	82.25	10.28	370.26	46.28	347.53	43.44
2010	963.58	95.21	9.88	447.64	46.46	420.63	43.66

Source: Compiled from the *Hubei Statistical Yearbook (2007–2011)*

There exists considerable difference in the industrial structure of different cities in Wuhan metropolitan cluster. In 2010, the proportion of tertiary industry in Wuhan City was the highest, reaching 51.44 %. The secondary industry played a dominant role in Huangshi, Ezhou and Qianjiang, each with a proportion exceeding 50 %. Other cities also gave priority to the secondary industry, while the proportions of their primary industry were higher than that in the above four cities, as shown in Table 6.4.

Under the guidance of government policy and the influence of market behavior, cities within Wuhan metropolitan cluster are forming an industrial pattern featuring

Table 6.4 Status of three industries of each city in Wuhan metropolitan cluster for 2010

Index	Regional GDP (billion RMB)	Primary industry (billion RMB)	Proportion in regional GDP (%)	Secondary industry (billion RMB)	Proportion in regional GDP (%)	Tertiary industry (billion RMB)	Proportion in regional GDP (%)
Wuhan	556.59	17.00	3.06	253.28	45.51	286.31	51.43
Huangshi	69.01	5.36	7.77	39.49	57.21	24.16	35.01
Ezhou	39.53	5.15	13.02	23.14	58.52	11.25	28.46
Xiaogan	80.07	17.12	21.38	36.09	45.08	26.86	33.54
Huanggang	86.23	24.70	28.64	32.82	38.06	28.72	33.30
Xianning	52.03	10.10	19.41	23.78	45.70	18.16	34.90
Xiantao	29.10	5.41	18.60	13.79	47.40	9.89	34.00
Qianjiang	29.07	4.82	16.58	15.21	52.32	9.04	31.10
Tianmen	21.95	5.55	25.30	10.05	45.77	6.25	28.48
Total	963.58	95.21	9.88	447.64	46.46	420.63	43.65

Source: Compiled from the *Hubei Statistical Yearbook* (2011)

rational division of labor and complimentary development. For Wuhan City, auto machinery, iron and steel, optoelectronics information and petrochemicals are pillar industries; medicine industry, light industry, apparel and textile industry, building materials and food industry have been developed to considerable scale; modern services such as finance, logistics, modern business and information service are comparatively developed. Huangshi City and Ezhou City give priority to the development of metallurgy, petrochemicals, biomedicine and building materials industries. Xiaogan, Xiantao, Qianjiang, and Tianmen give preference to the development of textile and apparel industry, food processing industry and chemical industry. Meanwhile, auto and accessories industry, machinery industry are also developed in these cities to support the electromechanical industry of Wuhan City. Major industries of each city in Wuhan metropolitan cluster are shown in Table 6.5.

6.2 Characteristics of Logistics Development in Wuhan Metropolitan Cluster

Logistics in Wuhan metropolitan cluster plays an important role in the national logistics network. With rapid development of the regional economy, the overall scale of logistics market in the cluster has expanded rapidly. Bolstered by the booming business development and the construction of Wuhan Newport, Wuhan metropolitan cluster enjoys a well-developed business logistics and prosperous port logistics. Meanwhile, to promote the integration and development of regional economy, Wuhan metropolitan cluster has continually promoted the construction of integrated regional logistics system.

Table 6.5 Major industries in Wuhan metropolitan cluster

City	Major industries
Wuhan	Iron and steel, machinery, ship, auto, optoelectronics information, petrochemical, light industry, equipment manufacturing, logistics
Huangshi	Metallurgy, building materials, textiles, machinery, chemical, medicine, light industry, mechanical manufacturing
Ezhou	Non-ferrous metals, iron and steel, auto, petrochemical, textile, food, electronic information, tobacco, building materials, medicine
Xiaogan	Electromechanical, electronic information, new energy, salt-phosphor chemical, textile, food, metal products, plastic products, paper products, medicine, materials
Huanggang	Food, textile, pharmaceutical chemical, auto parts, building materials
Xianning	Electrical energy, textile, food, mechanical electronics, logging, metallurgical building materials
Xiantao	Textile and apparel, food, pharmaceutical chemicals, mechanical electronics
Qianjiang	Pharmaceutical chemicals, metallurgical machinery, textile, food
Tianmen	Textile, pharmaceutical chemicals, food, auto parts

Source: Compiled from relevant data in the *Hubei Statistical Yearbook* (2011)

6.2.1 Ever-Increasing Logistics Scale

6.2.1.1 Added Value of Transportation, Storage and Postal Industry

In 2011, added value of the transportation, storage, and postal industry for Wuhan, Ezhou and Huanggang cities increased by 35.52 billion RMB, 2.71 billion RMB and 3.92 billion RMB, respectively, as shown in Table 6.6.[4] From 2006 to 2011, the nominal average annual growth in added value of the transportation, storage and postal industry for Wuhan, Ezhou, and Huanggang is respectively 16.24 %, 9.39 %, and 13.08 %. As a result of the latest global financial crisis, added value of the transportation, storage and postal industry for Wuhan decreased in 2009; in the same year, this value for Huanggang increased by only 1.89 %,,which was much lower than its average growth rate for 2006–2011.

6.2.1.2 Freight Volume and Freight Turnover

From 2009 to 2011, freight turnover in Wuhan metropolitan area increased generally. The average annual growth rate of freight turnover for Wuhan, Ezhou, Huanggang and Xianning from 2009 to 2011 was 17.97 %, 9.45 %, 42.37 % and 17.17 %, respectively, as shown in Table 6.7.

As an important transport hub of Wuhan metropolitan cluster and Hubei Province, Wuhan City undertook a large quantity of freight. Table 6.8 shows the freight

[4] Since relevant data on the transportation, storage and postal industry for Huangshi, Xianning, Xiantao, Qianjiang and Tianmen are unavailable, they are not listed in the Table.

Table 6.6 Added value and growth rate of transportation, storage, and postal industry of four cities in Wuhan metropolitan area for 2006–2011

	Wuhan		Ezhou		Xiaogan		Huanggang	
Year	Added value (Unit: RMB billion)	Nominal growth rate (%)	Added value (Unit: RMB billion)	Nominal growth rate (%)	Added value (Unit: RMB billion)	Nominal growth rate (%)	Added value (Unit: RMB billion)	Nominal growth rate (%)
2006	16.74	—	1.73	—	—	—	2.12	—
2007	18.30	9.32	1.89	9.25	—	—	2.06	−2.83
2008	23.31	27.38	1.91	1.06	—	7.90	2.64	28.16
2009	23.07	−1.03	2.16	13.09	—	14.20	2.69	1.89
2010	30.69	33.03	2.21	2.31	—	15.10	3.33	23.79
2011	35.52	15.74	2.71	22.62	—	20.70	3.92	17.72
Average annual growth (%)	—	16.24	—	9.39	—	—	—	13.08

Source: Compiled from the *China Statistical Bulletin of National Economic and Social Development (2006–2011) of Wuhan, Ezhou, Xiaogan and Huanggang*, whererin data of added value of Xiaogan are absent

Table 6.7 Freight turnover in Wuhan metropolitan cluster for 2009–2011 (Unit: gigaton kilometer)

Year	Wuhan	Huangshi	Ezhou	Xiaogan	Huanggang	Xianning	Xiantao	Qianjiang	Tianmen
2009	190.01	—	2.32	—	4.66	3.00	1.92	1.91	0.74
2010	226.36	—	2.41	—	7.35	3.43	3.16	2.61	1.06
2011	264.42	—	2.78	—	9.44	4.12	—	—	—
Average annual growth rate (%)	17.97	—	9.45	—	42.37	17.17	—	—	—

Source: Compiled from the *China Statistical Bulletin of National Economic and Social Development (2009–2011) of Wuhan, Ezhou, Huanggang, Xianning, Xiantao, Qianjiang and Tianmen*

volume and freight turnover of Wuhan City for 2006–2011. As can be seen, freight volume and freight turnover of Wuhan City in 2011 was 418.04 megatons and 264.42 gigaton-kilometers respectively, increasing by 104.07 % and 107.43 % respectively compared to that in 2006. Highway, railway and water transportation undertook most of the freight volume in Wuhan. In 2011, freight volume via highway, railway and water transportation accounted for 53.68 %, 24.06 % and 22.23 % of total freight volume respectively. Freight turnover of Wuhan City showed an equal emphasis of railway and water transportation. In 2011, freight turnover through railway and water transportation in Wuhan City accounted for 46.39 % and 40.69 % of total freight turnover respectively.

Table 6.8 Freight volume and freight turnover of Wuhan City for 2006–2011

Indicator	2006	2007	2008	2009	2010	2011
Freight volume (megaton)	204.86	225.55	291.43	344.09	—	418.04
Railway	89.90	97.29	102.02	98.39	—	100.59
Water transportation	25.17	28.99	84.18	78.84	—	92.93
Highway	89.72	99.18	105.16	166.79	211.00	224.42
Aviation	0.07	0.09	0.08	0.07	—	0.10
Freight turnover (gigaton kilometer)	127.48	141.80	175.00	190.00	226.36	264.42
Railway	102.14	113.82	109.69	103.24	114.46	122.66
Water transportation	18.32	20.40	57.33	58.46	81.03	107.28
Highway	6.94	7.48	7.89	28.22	30.76	34.33
Aviation	0.08	0.10	0.09	0.08	0.11	0.15

Source: Compiled from the *China Statistical Bulletin of National Economic and Social Development (2006–2011) of Wuhan*

Table 6.9 Cargo and container throughput of Wuhan Newport for 2008–2011

Year	2008	2009	2010	2011
Cargo throughput (million ton)	83.16	86.57	103.30	1.15
Container throughput (million TEU)	0.47	0.56	0.65	0.71

Source: http://www.whxg.gov.cn

6.2.1.3 Throughput of Port

Wuhan Newport is centered on the Port of Wuhan and composed of part of other ports in Ezhou, Huanggang and Xianning, with a planned port area and hinterland of 9,300 km^2, a shoreline of 548.2 km and a maximum berthing capacity of 7,000 t. In 2010, its cargo throughput surpassed 100 million tons. Cargo throughput and container quantity of Wuhan Newport for 2008–2011 are shown in Table 6.9.

6.2.1.4 Air Cargo Throughput

In 2011, cargo throughput and aircraft take-off/landing in Wuhan's Tianhe Airport were 122,800 t and 117,000 times, respectively, increasing by 11.4 % and 4.0 % respectively compared to those in 2010. Table 6.10 shows the cargo tthroughput and take-off/landing in Tianhe Airport for 2006–2011. From 2006 to 2010, the average annual growth rate of cargo throughput in Wuhan Tianhe Airport was 7.3 %. Due to the global financial crisis in 2008 and the opening of Wuhan-Guangzhou high-speed railway in 2010, the growth rates of cargo throughput and take-off/landing of aircrafts in Tianhe Airport plummeted in these 2 years.

Table 6.10 Cargo throughput and take-off/landing in Wuhan Tianhe airport for 2006–2011

	Cargo throughput		Take- off/landing of aircrafts	
Year	Total (thousand ton)	Growth rate (%)	Times	Growth rate (%)
2006	73.8	15.2	66,876	29.1
2007	89.6	21.5	93,498	39.8
2008	89.9	0.4	98,372	5.2
2009	101.9	13.4	113,332	15.2
2010	110.2	8.2	112,521	–0.7
2011	122.8	11.4	117,010	4.0

Source: Compiled from the *Statistical Bulletin of Nationwide Airports (2006–2011)*, published by the Civil Aviation Administration of China

6.2.2 Significant National Transport Hub and Logistics Center

Wuhan City is an important comprehensive transport hub in China. First, it is one of the six major freight centers in China; Wuhan North Marshalling Station is the largest train marshalling station in Asia; Wuhan Railway Container Central Station is an important node in national railway container transportation, and one of the 18 container central stations constructed according to the *National Mid- and Long-Term Railway Network* planning. Secondly, Wuhan is one of the major highway hubs in China; in the *National High Speed Highway Network* planning, there are altogether six high speed highways passing through the Wuhan metropolitan cluster. Thirdly, Wuhan City is a hub of water transportation at the middle reaches of Yangtze River, and the Port of Wuhan is a national first-class hub port. Wuhan is deemed as one of the three inland navigation centers in the *Views on Accelerating the Development of Water Transportation on Yangtze River and Other Rivers* issued by the State Council. In addition, Wuhan Tianhe International Airport is the sole comprehensive hub airport in Central China, one of the six major regional air transportation hubs, and the air passenger and cargo gathering/dispersing center and aviation hub port. In 2007, the State Council approved the *Mid- and Long-Term Development Plan of Multimodal Transport Network*, in which Wuhan was designated as one of the eight pilot cities taking lead in initiating the connection of multi-modal transport hubs.

Wuhan metropolitan cluster is the logistics center of the Central Region. In the *Adjusting and Revitalization Plan about the Logistics Industry* in China, the "Central Logistics Region" centered on Wuhan and Zhengzhou was authorized as one of the nine priority areas for logistics development, and Wuhan was also designated as one of the 21 national first-class logistics nodes. Moreover, in the *Planning of National Zoning by Primary Functions* issued in 2010, Wuhan metropolitan cluster was also positioned as a major national comprehensive transport hub and logistics center.

6.2.3 Well-Developed Trade Logistic Center

Wuhan metropolitan cluster is an important inland commodity distributing center, in which Wuhan City is the largest inland logistics center and entrepot. Besides,

Wuhan's metal trading market plays a visible role in the nation's metal trading markets while Wuhan's materials market is the largest logistics trade center in Central China. In 2009, Wuhan City had 637 commodity trading markets, of which 67 had attained an annual trade value over 100 million RMB. A great number of large-scale wholesale markets of consumables and specialized markets such as small commodity markets in Hanzheng Street had appeared in the cluster.

In 2010, total sales of social consumer goods in Wuhan metropolitan cluster amounted to 441.42 billion RMB, of which, the total retail sales of social consumer goods for Wuhan City reached 257.0 billion RMB. This business scale ranked seventh in China, trailing behind Beijing, Shanghai, Chongqing, Tianjin, Guangzhou and Shenzhen.

Fostered by the flourishing trade business development, Wuhan metropolitan cluster realized a brisk development in commercial logistics. In 2010, total amount of commercial logistics in Wuhan City reached 745.4 billion RMB, increasing by 28.2 % compared to that in 2009, and accounted for 50.16 %[5] of the total social logistics in Wuhan City.

The development of commercial logistics in Wuhan area brought about the massive and professional development of business logistics enterprises. As the logistics transfer post in Central China, Wuhan established a large number of warehousing facilities for production materials such as metal, lumber, mechanical and electrical products, and possessed business networks across the entire country. Some large-scale commercial enterprises and logistics enterprises such as Carrefour, Metro, Wal-Mart, Gefco of France, Maersk of Denmark, Honda, Itochu, Sumitomo, Nissan, Nippon Express of Japan, Octopus of Taiwan, Silon of Hong Kong, Shanghai CNEX Express Co. Ltd, Gome, Suning, Jingdong, had gained access into the logistics industry of Wuhan metropolitan cluster through joint venture, cooperation and sole proprietorship.

6.2.4 Distinctive Logistics Development in Inland Port

As the largest port on the middle and upper reaches of Yangtze River, Wuhan Newport has developed an outstanding and distinctive port logistics in Wuhan metropolitan cluster owing to its excellent port condition, superior geographic location and vast economic hinterland.

First, logistics related industries of the Wuhan Newport are developed rapidly. The area of its hinterland reaches 9,000 km^2 with a GDP index 40 % higher than that of Hubei province. The hinterland of Wuhan Newport extends to Chongqing, Sichuan, Hunan, Shaanxi, Shanxi, and Henan via railway, highway, and waterway on Han River and Yangtze River. With the rapid economic development of its

[5] "Rapid Development of Wuhan Logistics in 2010," http://www.mofcom.gov.cn/aarticle/resume/dybg/201105/20110507564180.html.

hinterland, Wuhan Newport has maintained a rather swift development in both port throughput and container throughput in recent years.

Secondly, constant expansion of port range and continual improvement of Yangtze River waterway have provided new opportunities for the logistics development of Wuhan inland port. Wuhan Newport has successively established freight trade routes and launched intermittent freight services with Japan, Southeast Asian countries, Korea, and the Hong Kong/and Macao regions. The sailing time of "river-sea-non-stop" route from Wuhan to Shanghai Yangshan Port is shortened to 2 days, affording inland foreign trade logistics with convenient and speedy service. The opening of "COSCO Express" connecting to the European main route not only greatly reduces the shipping cost to Europe, but also shortens the voyage time by 1 week. The opening of freight route from Wuhan to Taiwan strengthens the cooperative exchange between Taiwan and the Mainland. With continual improvement of its logistics facilities and ever-expanding routes, Wuhan Newport assumes the foreign trade cargo logistics for Henan, Chongqing, Hunan, and Sichuan. Meanwhile, more domestic-bound goods from coastal regions like Fujian, Zhejiang are gradually choosing Newport as their freight transfer station.

Thirdly, port logistics parks and port-surrounding industries are gaining a sound development momentum. Wuhan metropolitan cluster focuses on the development of highly-augmentable industries such as water-land unified transport and river-sea unified transport, forming a large number of integrated entities such as harbor industrial zone, logistics base, warehousing bonded zone, and export processing zone. Wuhan Newport has invested over ten billion RMB in the construction of more than 10 industrial and logistics parks. By serving Wuhan Iron and Steel (Group) Corp., Wuhan Newport has established a first-class steel logistics base in Central China, integrating steel trading, processing, warehousing and transportation. Relying on its business development, Wuhan has become the international trade logistics group in Central China; on the basis of its deepwater port, Wuhan has constructed the largest coal reserve base in Hubei province, integrating warehousing, and processing; by virtue of its comprehensive traffic advantages, Wuhan has founded a national rice trading center, integrating warehousing, processing, trading and service.

6.2.5 On-Going Regional Cooperation

Wuhan metropolitan area has continually improved the construction of integrated regional logistics system and promoted the integration and development of regional economy by strengthening a seamless connection of its logistics infrastructures and establishing a regional logistics cooperation mechanism.

First, Wuhan has stressed the integration of its transportation infrastructure. The *General Plan of Wuhan Metropolitan Area* issued in 2007 proposed to establish an integrated and comprehensive transportation system with high speed and networking capability. The Plan called for the construction of infrastructure in highway, railway and waterway. For highway, the plan was to build the "one-hour transport circle"

centering on Wuhan City and reaching other major surrounding cities; for railroad, it planned to build the rail transport network by steps in order to consolidate Wuhan's position as one of the four major railway junctions. With respect to waterway channels, an inland waterway backbone network above level 5, linking the rivers and the seas was to be built. The network would include Yangtze River, Han River, Hanbei River as the main channels, the 12 branches of Yangtze River and Han River such as Fushui River, Qishui River, Xishui River, and Fuhe River as the ancillary channels, as well as Dongjing River, Tongshun River and other inland river systems as the supplementary channels.

Secondly, Wuhan has focused on establishing a collaborative mechanism. In July 2004, Hubei Province established the Steering Office to promote the construction of Wuhan metropolitan cluster, which has been operating effectively up to present. A multifaceted joint conference system was gradually formed among nine city governments to provide a sound platform for communication and cooperation among the cities. In 2004, departments in charge of commerce circulation of the nine cities signed the *Cooperation Agreement of Circulation in Wuhan Metropolitan Cluster* and the *Joint Council System of Circulation and Collaboration in Wuhan Metropolitan Cluster.* Various regions established liaison systems and set up professional information circulation teams to build a closer relationship among them, and launched the circulation coordination organization and collaborative mechanism of Wuhan metropolitan cluster. The Commerce departments of these cities further refined the interactive planning of circulation and collaboration, the innovative and collaborative system, and strengthened the construction of information platform on the basis of cooperative joint conference. Moreover, various industry associations were guided to expand their scope of operations, extend the range of task, and organize multi-level and multi-form learning, communication and enterprise cooperation.

6.3 Future Development of Logistics in Wuhan Metropolitan Cluster

In 2011, the *Twelfth Five-Year Plan for Modern Logistics Development in Hubei Province* was issued, which clearly spelled out the logistics development orientation of Wuhan metropolitan cluster, the logistics development direction of each city and the major fields of development.

6.3.1 Overall Orientation of Logistics Development

The goal of the logistics development of Wuhan metropolitan cluster is to build it into a "kernel-axis" regional logistics network system with the goal of supporting the cluster's economic advancement. Wuhan metropolitan cluster not only aims to

become the logistics hub for serving the industry chain in the Central Region and for linking the transfer of regional goods, but also strives to grow into a modern logistics center in China, and even one in the world.

6.3.2 Logistics Development Direction in Each City

The chief tenet of logistics development for Wuhan City is to promote and elevate its functions as a nationwide logistics nodal city, and to serve the manufacturing, trade and tourism industries in Wuhan City and Wuhan metropolitan cluster. It will actively support the construction of the comprehensive bonded zone in Donghu District, improve the logistics service level, and strengthen the effective connection of various transportation modes including railway, waterway, highway, and aviation. It will also accelerate the construction of key logistics parks and logistics centers, establish national logistics industrial demonstration zone, and build a key modern logistics center in China and a comprehensive bonded logistics base in the Central Region.

Logistics development of Huangshi City mainly revolves around metallurgy, building materials, new energy resources, coal, agriculture products processing, food, and tourism industries. Xiaogan City focuses on developing a logistics industry for relevant pillar industries in agriculture and manufacturing, as well as for the organic chemical and trade industries. Ezhou City emphasizes on developing logistics for modern agriculture, machinery, pharmaceutical chemicals, building materials, food processing, and apparel industry. Huanggang City is engaged in developing logistics of key clustered enterprises such as agriculture, forestry products processing, shipbuilding, steel structure, pharmaceutical chemicals, machinery manufacturing, and electronics industries. Xianning City specializes in logistics industries of specialty agriculture, electric power, textile, logging, electromechanics, auto parts, metallurgy, and building materials. Xiantao City places its logistics priority on industries such as textile, apparel, fine chemicals, mechatronics, non-woven fabrics, medical equipment, and food processing. Logistics in Qianjiang City mainly serves the oil extraction and processing, chemical medicine, metallurgical machinery, auto parts manufacturing, textile and apparel, and agricultural products processing industries. Tianmen City attaches more importance to logistics for agriculture and agro-processing, textile and apparel, auto parts manufacturing, machinery and electronics, medicine and chemical, and trade industries.

6.3.3 Development of Key Logistics Industries in Wuhan Metropolitan Cluster

Key logistics industries involved in Wuhan metropolitan cluster comprise industrial logistics and commercial logistics.

It was stated in the *Twelfth Five-Year Plan for Modern Logistics Development in Hubei Province* that modern industrial logistics service networks[6] with "one core and five zones" was to be formed in Hubei Province based on the current status and future planning of its industrial development. The five logistics zones consist of the metallurgy and building materials logistics service zone, the auto parts logistics services zone, the petrochemical and salt chemical logistics services zone, the food, medicine and phosphorus chemical industry logistics services zone, and the textile, apparel and household appliances logistics services zone.

The trade logistics of the cluster aims to establish a national trade logistics service base and form a significant commercial logistics and trading center in the Central Regions. The goal is to focus on developing logistics networks compatible to all commercial networks, and to complete the construction of a tri-tiered business logistics service base node encompassing logistics distribution center within enterprises, professional processing distribution centers and integrated logistics parks.

6.3.4 Key Fields in Logistics Development

During the "Twelfth Five-Year Plan" period, key fields of logistics development in Wuhan metropolitan cluster include: bonded logistics, transit logistics, express logistics and emergency logistics.

In terms of bonded logistics, it is essential to achieve the full functions of bonded logistics center in Dongxihu District (type B), bonded warehouse in Yangluo Port and export processing zone in Zhuankou. Besides, it is necessary to accelerate the construction of Donghu comprehensive bonded zone and set up Huangshi bonded logistics center, promote the bonded zone, bonded logistics park, logistics processing zone and other special customs supervision areas. By so doing, the pilot projects pursuing the principle of "functional integration and policy superposition" could be implemented. Development of transit logistics mainly refers to optimizing the mode of transportation and distribution via aviation, railway and highway. Main tasks for include enhancing handling and transit capacity of various transportations, completing auxiliary services of various transportations, establishing logistics service base at logistics transit nodes, and providing high value-added services such as sorting and dispatching, processing and packaging for transit logistics. For emergency

[6] "One core and five zones" industrial logistics service network refers to Wuhan City and other five neighboring zones. The five zones include: a. the "Wuhan—Ezhou—Huangshi" metallurgy and building materials logistics service zone to the southeast of Hubei; b. the "Wuhan—Suizhou—Xiangyang—Shiyan" automobile and parts logistics service zone to the southwest of Hubei; c. the "Wuhan—Qianjiang—Jingmen" petrochemical and salt chemical logistics service zone toward Jianghan Plain; d. the "Xiangyang—Jingzhou—Jingmen—Wuhan—Ezhou—Huangshi" textile, apparel and household electrical appliances logistics service zone in the east and west; e. the Wuhan—Yichang food, medicine and phosphorus chemical industry logistics service zone to the west of Hubei.

logistics, it is crucial to establish the logistics system by relying on the emergency logistics base of the national strategic material reserves in Central China and including Wuhan as the site for relief material reserves.

6.4 Summary

This chapter describes the logistics development of Wuhan metropolitan cluster in terms of the regional economic development, features of its logistics development and the future trend of logistics development in this area. In view of the regional economic development, Wuhan metropolitan cluster has realized a sustained growth in regional economic aggregate, total sales of social consumables and import and export trade. In terms of the features of logistics development, Wuhan metropolitan area is an important logistics and transportation junction in China, with continually expanding logistics markets, advanced commercial logistics, distinctive inland port logistics and ongoing regional logistics cooperation. According to the *Twelfth Five-Year Plan for Modern Logistics Development in Hubei Province*, Wuhan metropolitan cluster will be built into a logistics hub for the industrial chains in the Central Regions and serving as a transit linkage of goods between different regions. At the same time, Wuhan metropolitan cluster will be established into a national or international modern logistics center; many cities within the area will develop diverse forms of industrial and commercial logistics by virtue of their distinctive industries. The primary fields of logistics development in Wuhan metropolitan cluster include bonded logistics, transit logistics, express logistics and emergency logistics.

Chapter 7
Logistics Development of Inner Mongolia Autonomous Region

Jianhua Xiao

Lying in China's north borderland and adjacent to Russian and Mongolia, Inner Mongolia Autonomous Region (hereinafter referred to as "Inner Mongolia") is China's important energy base, production and processing base for nonferrous metals, green agricultural, and animal products. In recent years, Inner Mongolia has accelerated the opening of its border ports, greatly developed its advantageous specialty industries, and achieved rapid economic and social development. Driven by sustained and rapid economic development and the implementation of relevant policies, logistics in Inner Mongolia also develops swiftly, and has become one of the regions in Western China with more thriving logistics development.

This chapter comprises three parts. The first part introduces the economic development status of Inner Mongolia, including the economic indicators and the main composition and characteristics of its industries; the second part explains the logistics market development of Inner Mongolia, addressing the demand and supply conditions of logistics market and general characteristics of logistics development; the third part presents the logistics development of Inner Mongolia's ports, including the overall growth of its ports, the development of its major ports, and the main problems existing in port logistics development.

7.1 Economic Development Conditions in Inner Mongolia

Inner Mongolia abounds in natural resources such as coal, rare earth, and wind energy, and possesses a well-developed livestock processing industry. Recently, it leverages the advantages of its resources and geographical location to greatly develop its distinctive industries in energy, metallurgy, chemical engineering,

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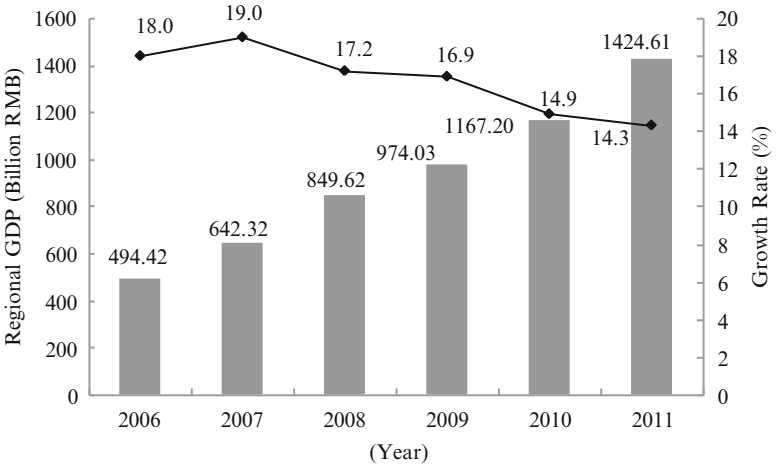

Fig. 7.1 Regional GDP and growth rate of Inner Mongolia for 2006–2011 (Source: Compiled from the *Statistical Yearbook (2011) of Inner Mongolia* and the *Statistical Bulletin of National Economic and Social Development (2011) of Inner Mongolia,* published by the Statistics Bureau of Inner Mongolia)

equipment manufacturing, agricultural and animal products processing, and high and new technology, thus enhancing its economic strength considerably.

7.1.1 Major Economic Indicators of Inner Mongolia

7.1.1.1 Regional GDP

In 2011, Inner Mongolia realized a regional GDP of 1,424.61 billion RMB, viz. a year-on-year growth of 14.3 %[1]; the growth rate, ranking fifth among all provinces in China, is 5.1 % points higher than the national average. Since 2009, Inner Mongolia has sped up the pace in changing its mode of economic development, made effort to adjust the sole coal-relying industrial structure and striven to develop non resource-based industries; these moves have aptly slowed down its economic growth. Figure 7.1 shows the annual data.

7.1.1.2 Industrial Added Value

In 2011, Inner Mongolia realized an industrial added value of 715.89 billion RMB, viz. a year-on-year growth of 18.2 %. Therein, the added value of above-the-scale industrial enterprises[2] achieved a year-on-year growth of 19 %, viz. 5.1 % points

[1] In this chapter, price variations have been taken into consideration when growth rates of indicators such as GDP, industrial added value and foreign trade volume of imports and exports are calculated. They refer to actual growth rates unless otherwise specified.

[2] Industrial enterprises above designated size are those industrial firms with annual main business income over 20 million RMB.

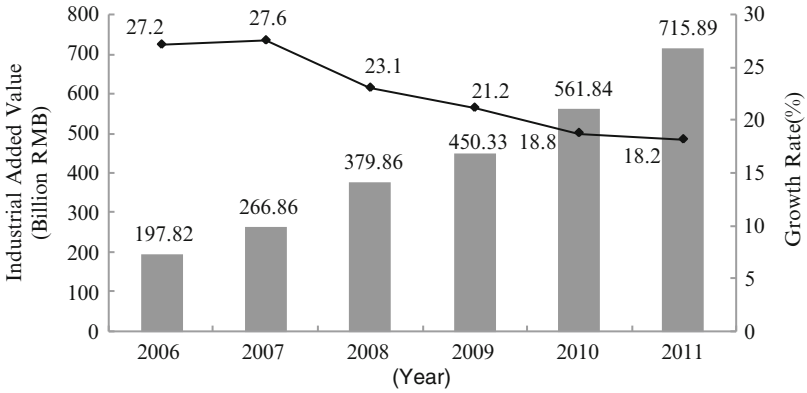

Fig. 7.2 Industrial added value and growth rate of Inner Mongolia for 2006–2011 (Source: Compiled from the *Statistical Bulletin of National Economic and Social Development (2006–2011) of Inner Mongolia,* published by the Statistics Bureau of Inner Mongolia)

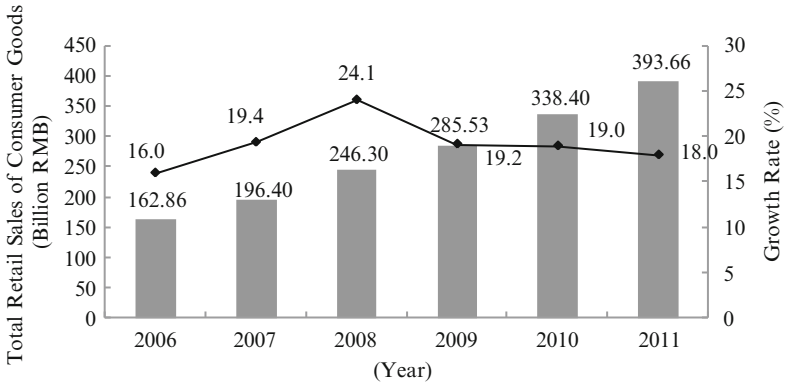

Fig. 7.3 Total retail sales of consumer goods and growth rate of Inner Mongolia for 2006–2011 (Source: Compiled from the *Statistical Yearbook (2011) of Inner Mongolia* and the *Statistical Bulletin of National Economic and Social Development (2011) of Inner Mongolia,* published by the Statistics Bureau of Inner Mongolia)

higher than the national average growth. The increase of added value of the light industry was 12 %, which was lower than the increase of 20.5 % for the heavy industry. Figure 7.2 shows the annual data.

7.1.1.3 Total Retail Sales of Consumer Goods

In 2011, total retail sales of consumer goods in Inner Mongolia reached 393.66 billion RMB, with a year-on-year growth of 18.0 %, which was 0.9 % points higher than the national average growth rate. Figure 7.3 shows the annual data.

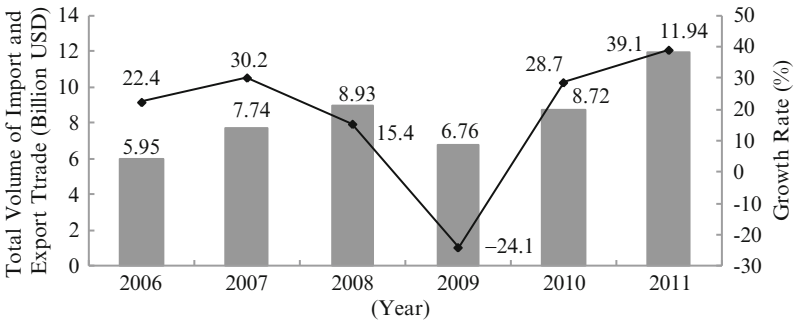

Fig. 7.4 Total volume of import and export trade and growth rate of Inner Mongolia for 2006–2011 (Source: Compiled from the *Inner Mongolia Statistical Yearbook (2011)* and the *Statistical Bulletin of National Economic and Social Development (2011) of Inner Mongolia,* published by the Statistics Bureau of Inner Mongolia)

7.1.1.4 Total Value of Import and Export Trade

The total value of import and export trade in Inner Mongolia reached 11.94 billion USD in 2011, with a year-on-year growth of 39.1 %, which was16.6 % points higher than the national average growth rate. Figure 7.4 shows the annual data for 2006–2011. Therein, total value of export trade was 4.69 billion USD, an increase of 40.6 % over 2010; while total value of import trade was 7.25 billion USD, an increase of 38.2 % over 2010. The trade deficit was 2.56 billion USD.

Among its principal trade partners, the first in trade volume is Russia, while the trade growth between Inner Mongolia and Mongolia was more rapid. In 2011, total trade volume of Inner Mongolia with Russia was 480 million USD, and total trade volume of Inner Mongolia with Mongolia was 2.85 billion USD; the latter with a year-on-year growth of 68.3 %. Total volume of import and export trade of Baotou, Manzhouli and Hohhot each broke 2 billion USD, viz. 2.77 billion USD, 2.50 billion USD and 2.03 billion USD, respectively.

7.1.2 Industrial Structure and Characteristics

7.1.2.1 Industrial Structure of Inner Mongolia

In recent years, Inner Mongolia has continually adjusted its industrial structure; the ratio of three industries was adjusted from 12.8: 48.1: 39.1 in 2006 to 9.2: 56.8: 34.0 in 2011. Therein, the proportion of added value of the primary industry and tertiary industry decreased year by year, while that of the secondary industry rose

Table 7.1 Compositions of the three industries in Inner Mongolia for 2006–2011

Year	Primary industry		Secondary industry		Tertiary industry	
	Added value (billion RMB)	Proportion (%)	Added value (billion RMB)	Proportion (%)	Added value (billion) RMB	Proportion (%)
2006	63.49	12.8	237.50	48.1	193.43	39.1
2007	76.21	11.9	319.37	49.7	246.74	38.4
2008	90.80	10.7	437.62	51.5	321.21	37.8
2009	92.96	9.5	511.40	52.5	369.67	38.0
2010	109.53	9.4	636.77	54.5	420.90	36.1
2011	130.49	9.2	809.21	56.8	484.91	34.0

Source: Compiled from the *Statistical Bulletin of National Economic and Social development (2011) of Inner Mongolia* and related data from Bureau of Statistics of Inner Mongolia Autonomous Region, published by the Statistics Bureau of Inner Mongolia

continually under the pull of its six advantageous specialty industries. Compositions of the three industries in Inner Mongolia for 2006–2011 are shown in Table 7.1.

7.1.2.2 Main Characteristics of Industrial Development

Acceleration of Extension and Upgrade of Resourced-Based Industries

Despite of the abundant resources and rapid development of its resource-based industries like coal, electric power, and metallurgy, Inner Mongolia is still confronted with the problems of short industrial chains and having chiefly primary and low-end products. In recent years, Inner Mongolia has actively undertaken industrial transfer from the nation's developed regions and pushed forward the extension and upgrade of its resource-based industries. Examples of these actions include extending the industrial chain by utilizing new technology, new equipment and new process, developing refined processing, and accelerating the structural adjustment and upgrading/updating of the steel products. Further examples cover (a) strengthening the post-processing of rare earth, steel and aluminum and extended processing of construction plastics and methanol, (b) promoting the extension and upgrade of advantageous industries such as steel, non-ferrous metal and chemical engineering, and (c) improving the conversion and deep processing level of agricultural and animal products.

In addition, Inner Mongolia has also adjusted and optimized its product structure by carrying out major projects in industrial technological upgrade, and enhanced the added value and competitiveness of its products. For example, Baotou Iron & Steel (Group) Co., Ltd. attained these improvements by setting up advanced production line and eliminated outdated capacity by introducing SMS-MEER, DANIELI and other world-class technologies.

7.1.3 Acceleration in Industrialization of Animal Husbandry

Inner Mongolia has copious husbandry resources—grassland area, per capita cultivated land and forestry area ranking first in China, which make it an important production base of commodity grain and agricultural and animal products. Its total output of meat, milk and eggs, as well as the aggregate production level of animal husbandry rank first among five pasturing areas in China; the yield of cashmere, sheep wool and camel's hair also rank first in China. Recently, Inner Mongolia strives to cultivate and develop advantageous specialty industries involving milk, meat, wool, tomato, cereal and oil, and poultry farming. This endeavor has formed the pattern of husbandry industrialization, led by the dairy product processing industry and supported by the food and cashmere industries, covering diverse development of advantageous industries, traditional industries and distinctive industries. Consequently, a host of leading enterprises in husbandry industrialization like Yili and Mengniu have emerged. By the end of 2011, Inner Mongolia has had 38 nationally-leading industrialized husbandry enterprises, 39 renowned Chinese-brands of agricultural and animal products, and 29 enterprises with annual business revenue exceeding one billion RMB.

In 2011, there were 1,779 processing enterprises of industrialized husbandry, each with a sales revenue of over 5 million RMB in Inner Mongolia, which together realized a total sales revenue of 265.81 billion RMB, viz. a year-on-year growth of 9.9 %; this equals an added value of 80.85 billion RMB, viz. a year-on-year growth of 12.1 %, and accounts for about 11.3 % of the industrial added value of Inner Mongolia.

7.1.4 Rapid Development of Strategic New Industry

Relying on its abundant natural resources, resource-based industries of Inner Mongolia had developed rapidly in the past. Yet problems resulting from singular industrial structure are gradually becoming obvious due to much emphasis on resource-based industries. In May 2011, the Inner Mongolia Autonomous Government published the *Guiding Opinion on Undertaking Industrial Transfer, Developing Non-Resource-based Industries and Constructing Diverse Development and Multiple Supporting Industrial System of Inner Mongolia Autonomous Government* in order to actively develop non-resource-based industries and emerging strategic industries.

In 2011, the proportion of investment in non-resource-based and emerging strategic industries in Inner Mongolia rose from 47.5 % to 59.2 %, among which 60 non-resource-based industrial clusters realized sales revenue of 580 billion RMB, viz. a year-on-year growth of 41.0 %. Meanwhile, emerging strategic industries of Inner Mongolia, such as new energy, new material, biological pharmacy, etc. also achieved rather swift development; an example of which is the rapidly developing new energy by capturing the abundant wind energy resources. In 2011, Inner Mongolia had installed wind-powered generators totaling 14.56 million kW, ranking first in the nation, and wind-powered generation of 25.85 billion kW-hours, viz. a year-on-year growth of 29.7 %.

7.2 Development of Logistics Market in Inner Mongolia

In recent years, logistics demand in Inner Mongolia continues to rise, logistics infrastructure is gradually perfected and informatization is continuously improved; these factors has prompted the rapid promotion of its logistics supply and the successive establishment of professional logistics systems.

7.2.1 Logistics Market Demand of Inner Mongolia

7.2.1.1 Added Value of Transportation, Storage and Postal Service

During 2006–2010, added value of transportation, storage and postal service in Inner Mongolia had generally increased with an average annual growth rate of 15.5 %. Impacted by the global financial crisis, the growth rate of added value of transportation, storage and postal service in Inner Mongolia slumped in 2009. Along with the gradual recovery of the nation's economy and logistics, the added value reached 87.56 billion RMB in 2010, viz. a year-on-year growth of 13.2 %. Figure 7.5 shows the annual data.

7.2.1.2 Freight Volume and Freight Turnover

Table 7.2 shows freight volume and freight turnover of Inner Mongolia for 2006–2011. In 2011, its total freight volume was 1.567 billion tons, viz. a year-on-year growth of 18.5 %; among which the freight volume completed by railway transportation was 530 million tons, viz. a year-on-year growth of 12.8 % and accounting for 33.8 % of the total freight of Inner Mongolia; the freight volume carried by highway transportation was 1,037 million tons, showing a year-on-year growth of 21.7 % and accounting for 66.2 % of the total volume. Figure 7.6 shows the freight volume and nominal growth rate of Inner Mongolia for 2006–2011.

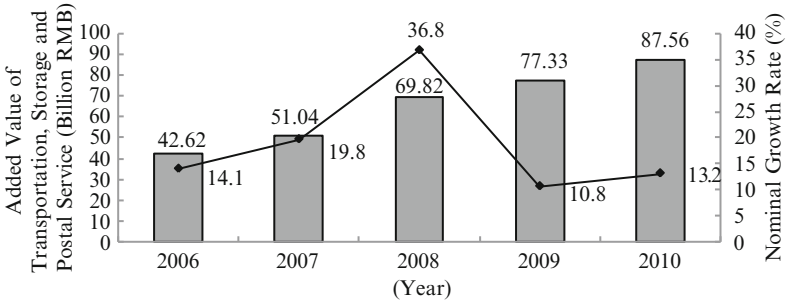

Fig. 7.5 Added value and nominal growth rate of transportation, storage and postal service in Inner Mongolia for 2007–2010 (Source: Compiled from the *Statistical Yearbook* (2007–2011) *of Inner Mongolia,* published by the Statistics Bureau of Inner Mongolia)

Table 7.2 Freight volume and freight turnover of Inner Mongolia for 2006–2011 (Freight volume: megaton, turnover: gigaton-kilometer)

	Total		Railway		Highway		Civil aviation	
Year	Freight volume	Turnover	Freight volume	Turnover	Freight volume	Turnover	Freight volume	Turnover
2006	841.37	179.84	251.57	141.40	589.78	38.41	0.020	0.02
2007	1029.07	212.14	296.05	162.94	733.00	49.20	0.018	0.02
2008	1000.12	354.84	390.70	191.10	609.41	163.74	0.011	0.01
2009	1165.08	396.31	456.75	207.79	708.32	188.53	0.010	0.01
2010	1322.05	394.92	470.40	168.81	851.62	226.11	0.031	0.009
2011	1567.00	435.30	530.00	162.60	1037.00	273.70	—	—

Source: Compiled from the *Statistical Yearbook* (2011) *of Inner Mongolia* and the *Statistical Bulletin of National Economic and Social development (2011) of Inner Mongolia*

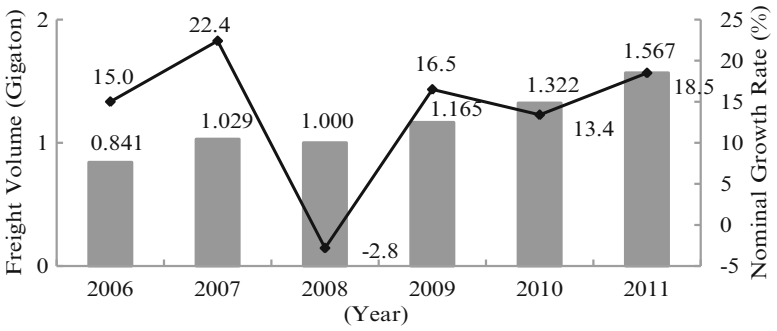

Fig. 7.6 Freight volume and nominal growth rate of Inner Mongolia for 2006–2011 (Source: Compiled from the *Statistical Yearbook* (2011) of *Inner Mongolia* and the *Statistical Bulletin of National Economic and Social Development (2011) of Inner Mongolia,* published by the Statistics Bureau of Inner Mongolia)

In 2011, Inner Mongolia finished 436.30 gigaton-kilometers in freight turnover, viz. a year-on-year growth of 10.2 %; among which the turnover completed by railway was 162.60 gigaton-kilometers, a decrease of 3.6 %, while that completed by highway was 273.70 gigaton-kilometers, an increase of 21.1 %. The freight turnover and nominal growth rate of Inner Mongolia for 2006–2011 are shown in Fig. 7.7.

Cargo Throughput at Ports

In 2011, inbound and outbound freight volume at Inner Mongolia ports reached 61.73 million tons, viz. a year-on-year growth of 17.7 %; among which, inbound freight volume was 44.88 million tons, increasing by 1.9 %, outbound freight volume was 9.12 million tons, increasing by 117.5 %, and transit freight volume was 7.73 million tons, increasing by 84.1 %. The freight volume and nominal growth rate of Inner Mongolia ports for 2006–2011 are shown in Fig. 7.8.

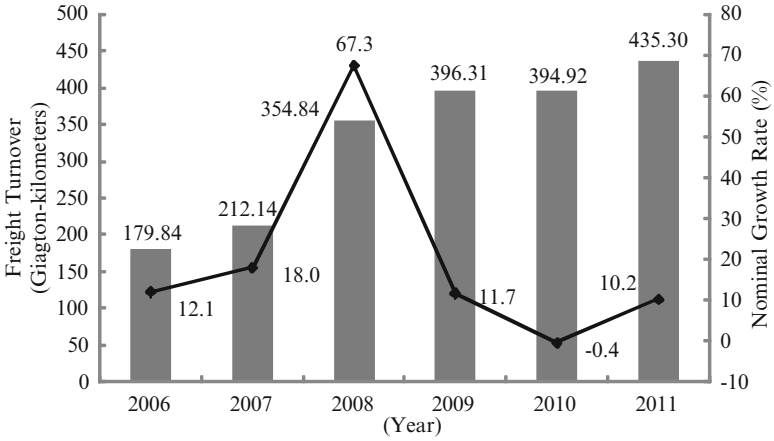

Fig. 7.7 Freight turnover and nominal growth rate of Inner Mongolia for 2006–2011 (Source: Compiled from the *Statistical Yearbook* (2011) of *Inner Mongolia* and the *Statistical Bulletin of National Economic and Social Development (2011) of Inner Mongolia,* published by the Statistics Bureau of Inner Mongolia)

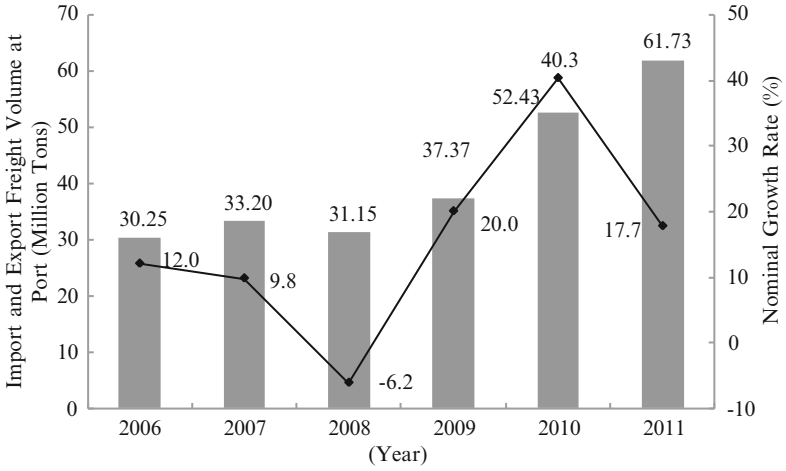

Fig. 7.8 Freight volume and nominal growth rate of Inner Mongolia ports for 2006–2011 (Source: Compiled from relevant data published by the Commerce Department of Inner Mongol Autonomous Region)

Among imported commodities in 2011, raw coal, mineral products and timber ranked as the top three items, with imported volume of 20.40, 10.55 and 9.61 million tons respectively, and showing a year-on-year growth of 21.57 %, 134 % and 17.8 % respectively. Among exported commodities, the top three items on the list were mineral products and building materials, apples and chemical products, which achieved an export volume of 0.726, 0.458 and 0.339 million tons respectively, showing a year-on-year growth of 12.5 %, 30.1 % and 14.2 % respectively.

7.2.2 Logistics Market Supply of Inner Mongolia

7.2.2.1 Conditions of Transport Infrastructure

1. Railway construction

To further take advantage of the railway in large-volume, long- distance transport of major bulk commodities, Inner Mongolia has sped up the construction of three major railway channels. The first is the construction of the west-east transport channel, by completing, for example, the Dongsheng-Wuhai Railway, and the Tongliao-Ulanhot Railway.

The second is the fortification of railway construction to all major ports; this includes completing and opening the Linhe-Ceke Railway, and commencing the railway construction of Bayan Obo—Mandula Port. The third is the amplification of the railway construction of land-exit-to-sea channel; exemplified by the completion of the Hohhot-Junggar Railway, and the Jining-Zhangjiakou Railway. The third is the acceleration of the railway construction for coal transport, such as commencing the Junggar-Shuozhou Coal Transport Railway Project, expanding the capacity of Datong-Junggar coal transport railway line and introducing the high-powered electric locomotive for Datong-Baotou railway line, so as to improve the coal transport capacity of railways.

By the end of 2011, the length of operating railways in Inner Mongolia had reached 9,670 km, accounting for 26.9 % of the total railway mileage in West China. During the "Twelfth Five-Year" period, Inner Mongolia will further strengthen its railway construction to realize a total investment in railway construction of 230 billion RMB, reaching a total operational mileage of 16,000 km and a total railway freight capacity of over 1 billion tons.

2. Highway construction

During 2006–2010, Inner Mongolia also witnessed a rapid development in highway construction. By the end of 2010, its total highway mileage added up to 157,000 km, viz. an average annual growth rate of 14.7 %; among which expressways reached 2,370 km with an average annual growth rate of 18.8 %, first-class highways were 3,390 km with an average annual growth rate of 9.6 %, and high-grade highways reached 18,000 km with an average annual growth rate of 9.4 %. In 2011, total highway mileage of Inner Mongolia exceeded 160,000 km.

It is predicted that by the end of the "Twelfth Five-Year" period, mileage of newly constructed highways in Inner Mongolia will have reached 13,000 km, raising the total highway mileage to 170,000 km and the total expressway mileage to 6,000 km.

3. Airport construction

In recent years, Inner Mongolia has successively constructed the Ordos Airport, Erenhot Airport, the ArxanShan Airport, and expanded the Hohhot, Baotou, Hailar, Ulanhot, Xilinhot, Tongliao airports. By the end of 2011, Inner Mongolia had 13

Table 7.3 Cargo throughput and ranking of airports in Inner Mongolia in 2011

Airport name	National ranking	Cargo throughput (thousand tons)	Growth rate (%)
Hohhot Baita Airport	35	25.218	22.0
Baotou Airport	50	7.492	23.3
Ordos Ejin Horo Airport	51	5.993	95.0
Hailar Dongshan Airport	62	2.987	40.2
Chifeng Yulong Airport	89	0.509	52.5
Xilinhot Airport	93	0.446	107.7
Wuhai Airport	101	0.712	450.8
Manzhouli Airport	102	1.528	25.5
Tongliao Airport	117	1.187	148.6
Ulanhot Airport	122	0.225	86.5
Erenhot Saiwusu Airport	138	0.007	−65.8
ArxanShan Airport	176	—	—
Bayannur Tianjitai Airport	177	—	—

Source: Compiled from the *Statistical Bulletin of Nationwide Airports* (2011), published by the Civil Aviation Administration of China

civil airports, ranking second in number in China. Cargo throughput and ranking of airports in Inner Mongolia in 2011 are shown in Table 7.3.

During the "Twelfth Five-Year" period, Inner Mongolia will possess 16 above-branch-route airports and will put into operation a total of 20 civil air carrier airports (including general and commuting airports).

7.2.2.2 Development of Logistics Information Platform

In the last few years, Inner Mongolia has accelerated the logistics information platform construction, strengthened the capacity of logistics resource integration and improved the logistics service level.

The public transportation logistics information platform of Inner Mongolia was put into operation in May 2010. The platform integrated six application systems, namely, the logistics information service web, the logistics enterprise credit management system, the highway freight trade information service system, the vehicle positioning and cargo tracking system, the vehicle maintenance and rescue service system, and the port logistics information service system. Meanwhile, this platform also improved the capability of information acquisition and resource integration of transport logistics through establishing the data sharing and exchange platform, the business integration platform and the contents dissemination and management platform.

Moreover, all leagues and municipal governments of Inner Mongolia also actively established their local logistics information platform. In August 2011, the construction of Ordos Logistics Information Port with a total investment of 3.3 billion RMB was completed and launched into full operation. The port comprised two main parts: the Ordos highway port and the Ordos general logistics information

platform; the latter mainly provided on-line resources, vehicles, transport quotation and other services for logistics enterprises, thus fortifying the informationized, networked, intelligent and intensive development of Ordos logistics industry.

7.2.2.3 Construction of Logistics Parks

Since 2006, Inner Mongolia has accelerated its construction of logistics parks, and built 78 logistics parks, each with investment of over 100 million RMB. For example, Chifeng Hongshan Logistics Park has invested nearly 10 billion RMB, attracted 198 various enterprises and over 600 registered industrial and commercial firms to station in the park and achieved a 32.2 billion RMB trading volume. Moreover, it has set up six major functional zones: logistics distribution, material storage, auto trading, specialty market, tourism business and emerging business type zones.

Besides, relying on its advantages of coal, chemicals, metallurgy building materials, equipment manufacturing industries, Inner Mongolia has successively established a host of professional logistics parks. The first example is the construction of Dongsheng Coal Logistics Park and Baiyinhua Coal Comprehensive Logistics Center at the coal production base and transferring base. The second is the establishment of a host of professional logistics parks for hazardous chemicals at the chemical production base in Ordos, Xilin Gol, Wuhai and Hulun Buir. The third example refers to the Baotou Steel Deep Processing Logistics Park, Ulan Qab Zhonglian Building Materials Logistic Park based at the metallurgy and building materials production base and areas with large demand for these products.

7.2.2.4 Development of Logistics Enterprises

Logistics enterprises of Inner Mongolia developed momentously in recent years. By the end of 2010, there were 1913 registered logistics enterprises in Inner Mongolia, among which 210 logistics enterprises each had a registered capital exceeding 10 million RMB, and 18 of those processed a Triple-A or higher rating. Presently, logistics enterprises in Inner Mongolia can be generally classified into four types. The first type are logistics enterprises majoring in bulk materials and express transportation, set up by local railway, highway, civil aviation and postal departments by utilizing their inherent advantages in transport resources. For example, Hohhot Railway Administration had established eight logistics companies along the railway line, which had become the backbone of bulk logistics transportation in the Midwest of Inner Mongolia. The second type refers to logistics enterprises developed from restructuring of local traditional transportation and storage companies, such as Ankuai, Zhonghao, Bayun, Tongyun, and Inner Mongolia Material Storage. The third type are well-known domestic and foreign logistics enterprises, such as COSCO, Sinotrans, CRCT, ZJS Express, DHL and other large logistics conglomerates, stationed in Inner Mongolia for market participation. The fourth type is logistics distribution enterprises centered on commercial distribution chain; these include large domestic commercial chain businesses such as Beijing Hualian, and

Table 7.4 Main lines connecting the eastern and western logistics channels of Inner Mongolia

Channel type	Main lines
First-class highway	Alxa Left Banner-Wuhai, Dongsheng and Qipanjing
Expressway	Wuhai-Jining, national highway 111 and Chifeng-Tongliao
Provincial highway	Jining-Arong Banner-Hailar
Railway	Beijing-Baotou, Baotou-Lanzhou, Beijing-Chifeng-Manzhouli, and Xilinhot-Huolin River-Ulanhot

GOME Appliances. Besides, medicine chain logistics is also developing rapidly and the Inner Mongolia Free Pharmaceutical Chain Corporation has developed into a key enterprise of Inner Mongolia.

7.2.3 General Characteristics of Logistics Development in Inner Mongolia

7.2.3.1 Preliminary Formation of the Three Logistics Channels

In recent years, by centering on industrial clusters, ports and entrepots, Inner Mongolia has formed three major logistics channels: the east–west crossing channel, the port channel and the land-exit-to-sea channel.

The channels connecting the east and west of Inner Mongolia start from Alxa Left Banner in the west to Hailar and Manzhouli in the east, through Baotou, Hohhot, Jining, Chifeng and Tongliao, as shown in Table 7.4.

The land-exit-to-sea channels can be classified into three regional logistics channels to the Northwest/Southwest, North China and the Northeast, with main lines shown in Table 7.5.

The logistics channels of ports are mainly composed of highway channels, railway channels and aviation channels to all ports. Currently, highways are accessible to all ports. As for railway channels, Manzhouli and Erenhot ports both have completed the cross-border railways, Ceke Port had opened the railway from Linhe to Ceke in November 2010, and tracks for the Ganquan Railway of Ganqimaodu Port are laid and the line is expected to begin operation in 2012. For aviation channels, three airports of Hohhot, Hailar and Manzhouli have already been formed.

7.2.3.2 Rapid Development of Port Logistics at Borderlines

Inner Mongolia is one of the provinces with multiple ports in China and owns 19 ports opening to foreign countries, including 12 category-1 ports and 7 category-2 ports. Centering on Manzhouli Port in the east, Erenhot Port and Ganqimaodu Port in the middle and Ceke Port in the west, it has gradually formed the pattern of "fully opening up" in railway, highway, waterway and aviation.

In 2011, Inner Mongolia had an inbound and outbound freight volume of 61.73 million tons at ports, viz. a year-on-year growth of 17.7 %. Therein, the cargo

Table 7.5 Main lines of land-exit-to–sea channels

Channel direction	Channel type	Main lines
Logistics channel to the Northwest/ Southwest	Highway	National expressway 110, national expressway 210, national highway 109 and Dongsheng-Wuhai (Ningxia)
	Railway	Baotou-Lanzhou Railway, Baotou-Xi'an Railway and Dongsheng-Wuhai Railway
Logistics channel to North China	Highway	National expressway 110, national expressway 208, national expressway 109, Dongsheng-Shiqigou (Shanxi), national highway 207 and national highway 111
	Railway	Beijing-Baotou Railway, Dazhun Railway (Datong-Xuejiawan of Jungar Banner), Jining-Erenhot Railway, Beijing-Tongliao Railway and Lanfeng Railway
Logistics channel to the Northeast	Highway	National highway 301, national highway 302 (Ulanhot-White City), national highway 303 (Tongliao-Shuangliao), national highway 304 (Tongliao-Zhangwu), provincial road 206 (Chifeng-Maojingba) and provincial road 205 (Chifeng-Chaoyang)
	Railway	Harbin-Manzhouli Railway, Baicheng-ArxanShan Railway in Jilin, Chifeng-Jinzhou Railway, Tongliao-Daqing Ranghulu Railway and Fuxin-West Ujimqin Banner Railway

towards Russian ports was 26.65 million tons, showing a year-on-year growth of 2.1 %; the cargo towards Mongolia ports was 32.22 million tons, showing a year-on-year growth of 22.9 %, and the international container transit freight volume of inland ports was 2.86 million tons. In 2011, the trade volume of Inner Mongolia towards Russia and Mongolia reached 5.74 billion USD, which accounted for 48.1 % of its total foreign trade volume. Therein, trade volume toward Mongolia was 2.85 billion USD while that toward Russia was 2.89 billion USD, showing an increase of 68.3 % and 20.5 %, respectively.

7.2.3.3 Distinctive Characteristics of Industrial Logistics and Professional Logistics

In recent years, Inner Mongolia strives to develop six major logistics systems centering on its six advantageous specialty industries involving coal, chemicals, metallurgy and building materials, equipment manufacturing, agricultural and animal products processing and urban and rural distribution, with distinctive characteristics of industrial logistics and professional logistics. Take coal for example: Inner Mongolia has constructed a comprehensive coal logistics service system for coal transport via railways around the nation's coal base. By improving the transaction mode of coal trade, it reduces the intermediate links of coal logistics and lessens the environmental pollution during coal storage, transport, loading and unloading

operations. Meanwhile, by establishing a number of large coal logistics parks to perform on-site washing, blending and dispatching of coal, it has raised the added value and the comprehensive utilization ratio of coal resource.

Moreover, Inner Mongolia also formed some industrial logistics and professional logistics with distinctive characteristics, based on the development of other relevant industries. For example, hazardous goods logistics and pipeline logistics founded on the chemicals industry; distribution logistics of steels and building materials processing based on the metallurgy and building materials industry; parts and finished products logistics depending on the equipment manufacturing industry; container and cold chain logistics relying on the agricultural and animal products processing industry.

7.3 Logistics Development of Inner Mongolia's Ports

Thanks to its long borderline, numerous border ports, favorable resources, and location advantages, Inner Mongolia is considered China's most crucial northward-opening energy import channel. As Sino-Russian and China-Mongolia economic and trade cooperation being gradually enhanced and port infrastructure being continually perfected, port logistics of Inner Mongolia has achieved rapid development with steadily improved throughput capacity and rapidly expanded logistics scale.

7.3.1 General Conditions of Port Construction

Presently, Inner Mongolia possesses 19 ports located in 14 banners (cities) at the border, as well as at Hohhot City and Hulun Buir City, as shown in Table 7.6.

In 2011, the inbound and outbound freight volumes of Manzhouli, Erenhot, Ceke and Ganqimaodu ports all topped 10 million tons. These four ports are significant nodes in port logistics of Inner Mongolia; the total freight volume of these ports reached 57.92 million tons and accounted for 94 % of the total volume of Inner Mongolia. Figure 7.9 shows the locations of the four major ports of Inner Mongolia.

7.3.2 Development of Key Ports

7.3.2.1 Manzhouli Port

Situated in the triangle area of China, Russia and Mongolia, Manzhouli Port is the largest port along China-Russia border and takes on about 65 % of the Sino-Russia freight volume each year. Constituted of railway, highway and aviation ports, Manzhouli Port is the largest border land port in China with freight volume consistently ranking first.

Table 7.6 List of opening ports of Inner Mongolia

Country	Port name	Location of port	Time of approval for opening	Description
People's Republic of Mongolia (10 ports)	Erenhot railway port	Erenhot City	1956	Bilateral perennial opening port
	Erenhot highway port	Erenhot City	1992	Bilateral perennial opening port
	Ganqimaodu highway port	Bayannur City Urat Middle Banner	1992	Bilateral perennial opening port
	Ceke highway port	Alxa League Ejin Banner	1992	Bilateral perennial opening port
	Zhuen Gada Buqi highway port	Xilin Gol League East Ujimqin Banner	1992	Bilateral perennial opening port
	Mandula highway port	Baotou City Damao Banner	1992	Bilateral seasonal opening port (16th-30th of March, May, August and November)
	Arihashate highway port	Hulun Buir City New Barag Right Banner	1992	Bilateral seasonal opening port (6th-25th of January and April 1 to October 31)
	Kabuduge waterway port	Hulun Buir City	1992	Bilateral seasonal opening port (1st-20th of February, May, August and November)
	ArxanShan highway port	Xingan League ArxanShan City	2012	Bilateral seasonal opening port
	Bagemaodu highway port	Bayannur City	1993	Closed temporarily due to port reorganization in 2000
Russia (6 ports)	Manzhouli railway port	Manzhouli City	1901	Bilateral perennial opening port
	Manzhouli highway port	Manzhouli City	1998	Bilateral perennial opening port
	Heishantou waterway port	Argun City Hulun Buir City	1990	Bilateral perennial opening port
	Shiwei waterway port	Argun City Hulun Buir City	1991	Bilateral perennial opening port
	Hulieyetu waterway port	Hulun Buir City Old Barag Banner	1992	Closed temporarily due to port reorganization in 2000
	Erka highway port	Manzhouli City	—	Not opened
International (3 ports)	Hohhot aviation port	Hohhot City	1992	National category-1 airport and international airport
	Hailar aviation port	Hulun Buir City	1995	Opened Hailar-Chita route
	Manzhouli aviation port	Manzhouli City	2009	Opened Manzhouli-Russia Irkutsk and Manzhouli-Chita International routes

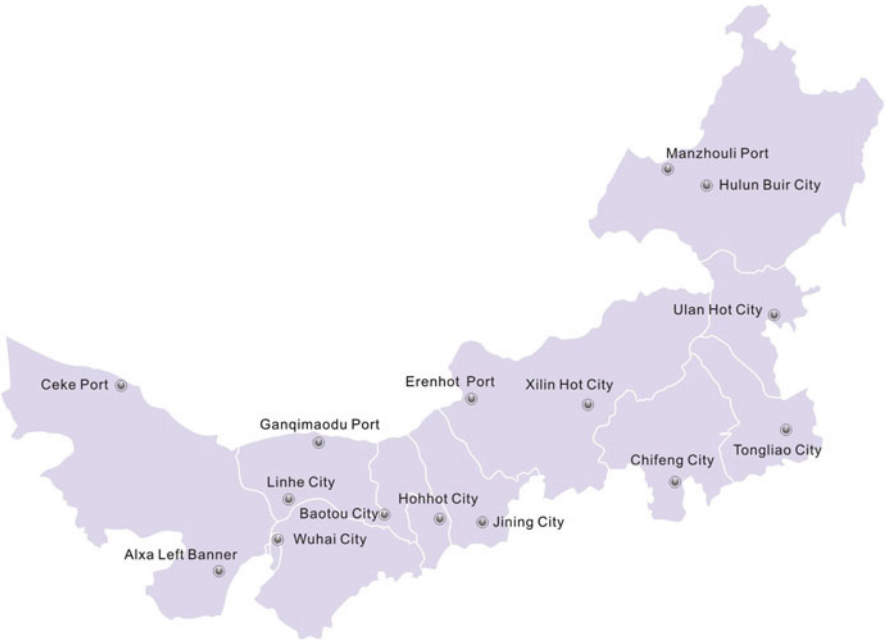

Fig. 7.9 Locations of the four major ports in Inner Mongolia

In 2011, freight volume of Manzhouli Port reached 26.60 million tons, viz. a year-on-year growth of 1.8 %, among which, the volumes of import, export and transit of railway port were 16.10, 2.11 and 7.73 million tons, while that of the import and export of highway port was 0.66 million tons. The freight volume and nominal growth rate of Manzhouli Port for 2006–2011 are shown in Fig. 7.10.

Import cargos of Manzhouli Railway Port constitute mainly of bulk products such as timber, crude oil, chemical products, paper, chemical fertilizer, iron ore, and synthetic rubber; while export cargos include mainly light industrial products, mechanical and electrical products, mineral products, petroleum coke, foods, and building materials. For highway port, scrap steel and timber account for more than 90 % of the total import cargos; vegetables and fruits account for over 85 % of the total export cargos. As a whole, crude oil amounts to about 50 % of the import freight volume.

Currently, Manzhouli Port owns nine well-equipped and all-around large or professional reloading storage bases, with an annual comprehensive reloading capacity of 30 million tons. At present it is undergoing an orderly construction of new international freight yard, with an annual comprehensive reloading capacity expected to reach 60 million tons.

7.3.2.2 Erenhot Port

Lying in the central part of Inner Mongolia, Erenhot Port is the only cross-border port between China and Mongolia, and also the land port nearest to Beijing. In 2011, the

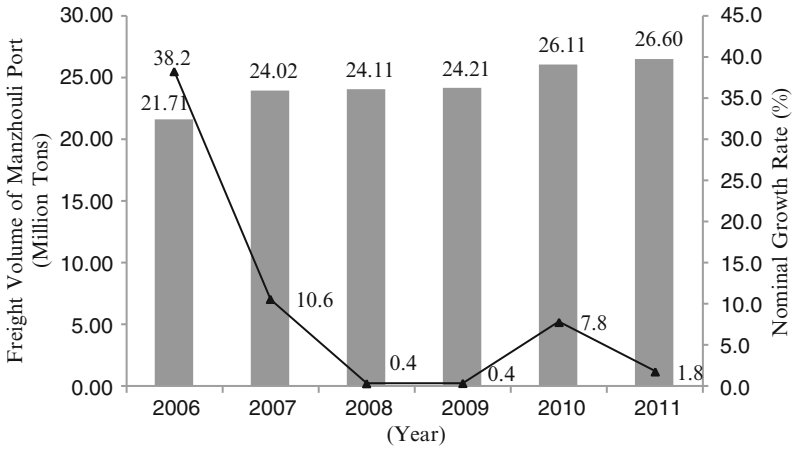

Fig. 7.10 Freight volume and nominal growth rate of Manzhouli port for 2006–2011 (Source: Compiled from relevant data published by the Commerce Department of Inner Mongol Autonomous Region and the Statistical Bureau of Manzhouli)

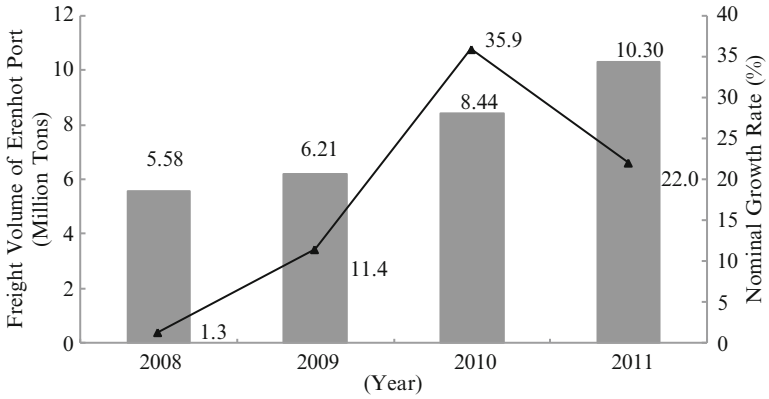

Fig. 7.11 Freight volume and nominal growth rate of Erenhot port for 2008–2011 (Source: Compiled from the *Economic Operation Report of Erenhot (2011)* and related data published by the Commerce Department of Inner Mongol Autonomous Region)

freight volume of Erenhot Port broke 10 million tons for the first time, reaching 10.30 million tons, showing a year-on-year growth of 22 %. Therein, the import freight volume was 7.57 million tons, showing a year-on-year growth of 16.2 %, while that of export was 2.73 million tons, marking a year-on-year growth of 29.8 %. The freight volume and nominal growth rate of Erenhot Port for 2008–2011 are shown in Fig. 7.11.

Erenhot's import cargos are mainly bulk goods such as timber, crude oil, powered copper ore, iron ore, and animal products, while its export cargos consist mainly of processed trade products and general trade products such as mechanical and

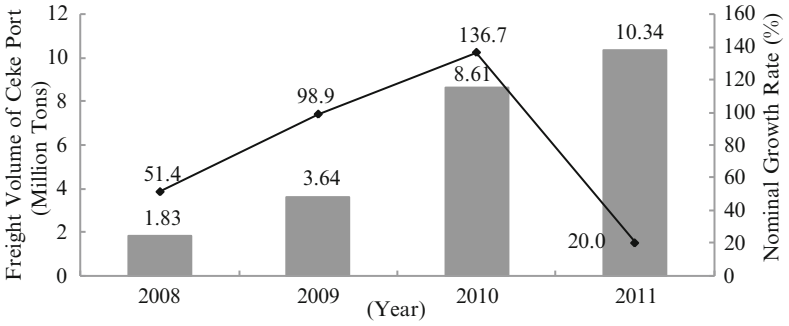

Fig. 7.12 Freight volume and nominal growth rate of Ceke port for 2008–2011 (Source: Compiled from related data published by the Commerce Department of Inner Mongol Autonomous Region)

electrical products, clothing, foods, building materials, and furniture. Therein, import cargos are mainly carried by railway, while export cargos are transported half by railway and half by highway.

Currently, Erenhot Port owns the largest packing/loading yard and reshipment warehouse of bulk goods in Asia. It has completed the construction of the H986 freight train inspection system and a joint inspection office hall, and possesses five warehouse operations areas, as well as 117 quasi-wide gauge railway lines. At present time, it is accelerating the construction of highway and railway logistics parks and perfecting its port logistics infrastructures.

7.3.2.3 Ceke Port

Set in the Ejin Banner of Inner Mongolia, Ceke Port is the only open land port shared by Shaanxi, Gansu, Ningxia and Qinghai provinces. In the last few years, Ceke Port had experienced a sharp increase in freight volume and become the seventh largest land port in China, and the third largest one in Inner Mongolia. In 2011, Ceke Port had a total freight volume of 10.34 million tons, showing a year-on-year growth of 20 %, which made it the second highway port breaking ten million tons of freight volume in Inner Mongolia. Therein, imported raw coal was 10.16 million tons, viz. a year-on-year growth of 18 %. The freight volume and nominal growth rate of Ceke Port for 2008–2011 are shown in Fig. 7.12.

Imported commodity of Ceke Port consists mainly of raw coal and non-ferrous metals, while exported commodity mainly includes grain and oil, daily necessities, clothing, building materials and farming equipment. Coal is the main cargo in import, with a proportion reaching 98.3 % of the imported goods in 2011.

Presently, Ceke Port has established seven special supervision sites and opened the Jiayuguan-Ceke Port Railway. Meanwhile it is actively constructing an express customs clearance system to improve the port's customs clearance capability.

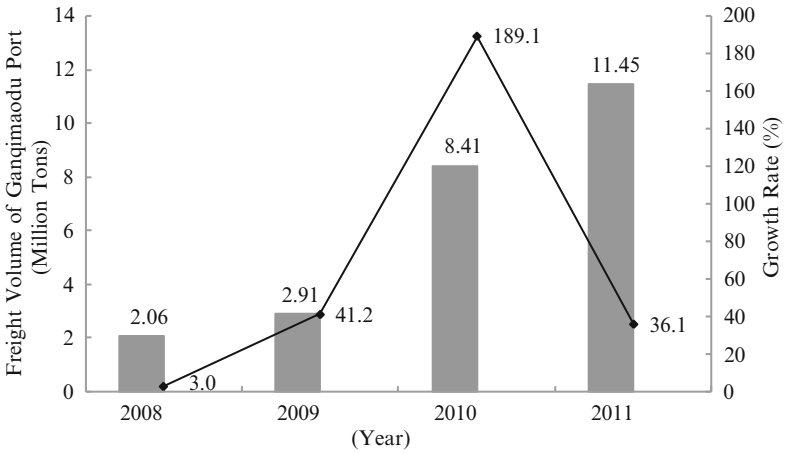

Fig. 7.13 Freight volume and growth rate of Ganqimaodu port for 2008–2011 (Source: Compiled from the *Statistical Bulletin of National Economic and Social Development (2008–2011) of Bayannur* and related data published by the Commerce Department of Inner Mongol Autonomous Region)

7.3.2.4 Ganqimaodu Port

Ganqimaodu Port is located at the border of China and Mongolia; it is the second highway port of China toward Mongolia and also a crucial energy and resources import/distribution centre in China. In recent years, freight volume of the port has increased rapidly. In 2011, the freight volume at Ganqimaodu Port reached 11.45 million tons, breaking the threshold of ten million tons and showed a year-on-year growth of 36.1 %; the trade volume achieved 1576.37 million USD, viz. a year-on-year growth of 83.5 %. Ganqimaodu Port has become the highway port with the largest freight volume in Inner Mongolia, and the comprehensive port ranking second only to Manzhouli Port. The freight volume and growth rate of Ganqimaodu Port for 2008–2011 are shown in Fig. 7.13.

Imported commodity of Ganqimaodu Port consists mainly of coal, powered copper ore, iron ore, animal products and bulk cargos, while exported commodity includes mainly processed trade products and general trade products such as light industrial products, motor vehicles, mechanical and electrical products, foods, vegetable and fruits, etc. Currently, import takes up more than 90 % of the total freight volume of Ganqimaodu Port, and the imported cargo is predominantly coal, accounting for about 95 % of the total import volume.

Currently, Ganqimaodu Port owns four customs supervision sites, its coal transport channel being increased to 10, thus the port's customs clearance capability and logistics system has basically been established.

7.3.3 Main Problems in Port Logistics Development

7.3.3.1 Infrastructure of Port Logistics Remains Weak

Most ports of Inner Mongolia are located in border areas with unfavorable natural conditions. Except for the four "ten-million-ton" land ports: Manzhouli, Erenhot, Ganqimaodu and Ceke, as well as the three aviation ports, the rest of ports are equipped with relatively backward infrastructure construction, manifested in three aspects. First, the construction of transport infrastructure is slow and only highway is currently available for most ports; these highways are of low grade and density. Moreover, railway construction develops slowly due to systems limitations and shortage of funds. Secondly, logistics parks are single-functioned, most of them are equipped with only storage function; environmental protection infrastructures for highly-polluting coal logistics parks and metal supervision areas lag behind. Finally, the construction of logistics information platform is inadequate, lacking effective logistics information platform and sound logistics operations network. Presently, the information platform among port enterprises as well as between enterprises and Mongolia has not been established yet, so the synergistic economic benefits of logistics service could not be fully attained.

7.3.3.2 Spatial Arrangement of Logistics Parks to Be Optimized

With the support of all local governments in Inner Mongolia, the planning and construction of port logistics parks is continually moved forward toward informatization, intensification and socialization. However, the spatial placement of logistics parks for most ports is still dispersed at present, not being located in close vicinity or around clustered industries. This drawback is to the disadvantage of intensive management and operations of port parks.

Besides, some logistics parks are close to the boarder gateway and towns, hence causing severe environmental pollution to the townships. Moreover, dwelling area and industrial area in townships are not segregated, causing overloaded transport channels; this condition is disadvantageous to the sustainable development of the towns and the ports.

7.3.3.3 Specialization of Logistics Enterprise Is Low

In recent years, all ports of Inner Mongolia are actively developing into comprehensive port and engaging in international business like import and export of light industrial products, foods, mechanical and electrical products, along with rapid development of professional logistics such as container and hazardous chemicals. Presently, in spite of their rapid development, most port logistics enterprises operate under a singular service mode and provide mainly simple transportation and storage services, with minimal specialization.

In addition, third-part logistics of ports is still under-developed and port logistics usually adopts the self-managed logistics mode with fairly low proportion of outsourcing. Meanwhile, for some port logistics enterprises the operations scale is small, the management and informatization level is low, the service quality is uneven, and the service awareness is in need of improvement.

7.4 Summary

This chapter discusses the current logistics development conditions of Inner Mongolia in three aspects: economic profile, logistics market conditions and port logistics development. From the economic development standpoint, Inner Mongolia strives to develop its advantageous specialty industries such as energy, metallurgy, chemicals, equipment manufacturing, agricultural and animal products processing and strategic new industries, by leveraging its resource and location advantage. These efforts have noticeably improved its level of industrial development and enhanced its economic strength. From the perspective of logistics market in Inner Mongolia, the scale of its logistics market demand continues to expand, the capability and level of its logistics supply are raised rapidly, its logistics infrastructure is perfected gradually, and its logistics channel and professional logistics system are formed successively. Finally, port logistics of Inner Mongolia has witnessed a marked growth, with rapidly expanding scale and steadily improved transport capability. As the infrastructure for port logistics being continually perfected and the specialization level of logistics enterprises being enhanced, logistics of Inner Mongolia will undoubtedly realize further development.

Chapter 8
Development of E-Commerce Logistics in China

Zhilun Jiao

With the elevation of its residents' consumption level and the popularization of electronic network media, China has witnessed a tremendous development in e-commerce. Logistics, as a critical link in consummating the e-commerce transaction and an essential factor on cost and efficiency, has gradually becomes the core in the competition of all kinds of e-commerce enterprises.

This chapter comprises four sections. The first section shows the classification and basic flow of e-commerce and describes the operations mode of e-commerce logistics in China. The second section introduces the current development of e-commerce logistics in China from the aspects of demand scale, logistics enterprise, operations mode, and industry policy. The third section puts forth the problems of e-commerce logistics, and Sect. 8.4 analyzes the development trend of e-commerce logistics in China.

8.1 Overview of E-Commerce Logistics

E-commerce is the electronization of the entire trading process and mainly consists of the diverse commercial activities with computer network (i.e., enterprise LAN and internet) as the medium.

8.1.1 Classification of the Modes of E-Commerce Transaction

At present, e-commerce transaction in China can be classified into three types: Business to Business (B2B), Business to Consumer (B2C) and Consumer to

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Table 8.1 Selected E-commerce service providers and their types

Type	Service provider	Product range	Service provider	Product range
B2B	GQPT.com	Integrated	chemnet.com.cn	Chemical equipment and products
	globalmarket.com	Integrated	pharmnet.com.cn	Medical equipment and drugs
	alibaba.com	Integrated	texnet.com.cn	Textile raw materials and products, printing and dyeing
	ic98.com	Integrated	efu.com.cn	Clothing
	99114.com	Integrated	cn.gasgoo.com	Automobiles and components
B2C	amazon.cn	Integrated	360 buy.com	Integrated, mainly household appliances and digital products
	tmall.com	Integrated	dangdang.com	Integrated, mainly books
	meituan.com	Integrated	redbaby.com.cn	Products for mothers and babies
	juegg.com	Digital products and household appliances	suning.com	Integrated, mainly household appliances
	m18.com	Clothing and household goods	vancl.com	Clothing and household goods
C2C	taobao.com	Integrated	paipai.com	Integrated

Consumer (C2C).[1] Since consumer is involved in transaction directly, B2C and C2C are also referred to as online-shopping. Enterprises engaged in e-commerce platform operations are called "E-commerce Service/Website Providers." E-commerce service providers in China mainly fall into the following categories:

1. B2B Service Provider can be classified into integrated B2B service provider and vertical B2B service provider. Wherein, the former type refers to e-commerce platforms involved in transaction of various types of products; typical enterprise includes "GQPT.com", "globalmarket.com", "alibaba.com", "ic98.com", etc. The latter type are platforms involved in product transaction of certain specific industry, including "chemnet.com.cn", "pharmnet.com.cn", "texnet.com.cn", "efu.com.cn" and so on. Selected e-commerce service/website providers and their types are shown in Table 8.1.
2. Online-shopping Service Provider includes B2C online-shopping Service Provider and C2C online-shopping Service Provider. Wherein, the former type is the online shop built by an enterprise for its consumers; the latter refers to a

[1] B2B (Business to Business) refers to e-commerce among enterprises. B2C (Business to Customer) refers to e-commerce between enterprise and consumers. C2C (Customer to Customer) refers to e-commerce among consumers. In addition to the above three types, there are some unusual types, such as B2G (Business to Government) and Online to Offline.

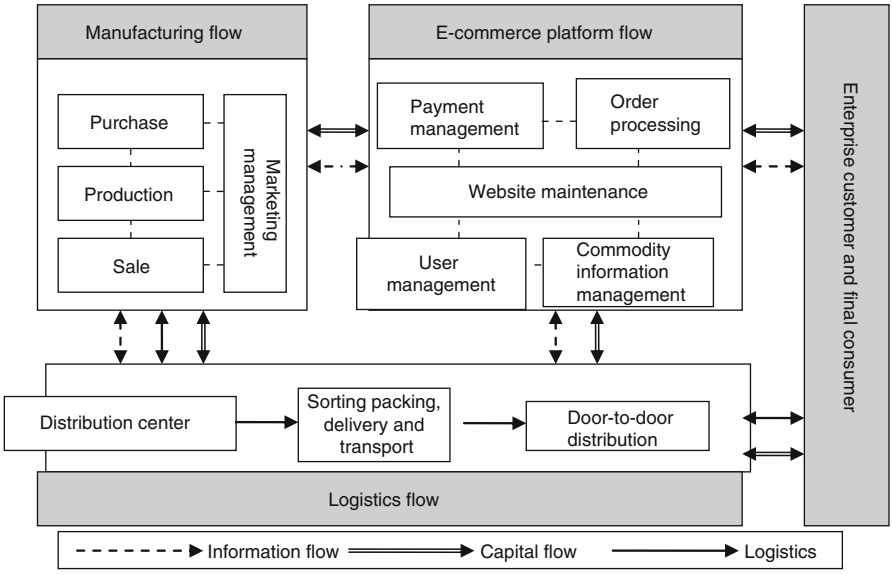

Fig. 8.1 General flow of E-commerce logistics (Source: Synthesized by the author)

platform for selling/purchasing commodities or transferring second-hand goods between consumers on the internet. Typical B2C online-shopping service providers include amazon.cn, 360buy.com, dangdang.com, meituan.com, tmall.com, juegg.com, etc.; the most typical C2C online-shopping service provider in China is taobao.com. Table 8.1 lists more details of these service providers.

8.1.2 Basic Flow of E-Commerce Logistics

Figure 8.1 shows a general model of e-commerce logistics flow in China. Consumers first acquire the transaction information and release the order through an e-commerce platform. The supplier processes the order and then hands over corresponding products to the logistics service provider, which delivers the products to the consumers to complete the final delivery.

8.1.3 Operations Modes of E-Commerce Logistics

8.1.3.1 Self-Operated Logistics of Industrial and Commercial Enterprises

Some manufacturing, sales or service enterprise establishes its own e-commerce platform and self-operated logistics business mainly through the following modes: (1) spin off the original information network service department and logistics

department from its enterprise to establish a subsidiary through assets integration; (2) form a subsidiary by infusing funds or merging the existing e-commerce service providers and logistics enterprises; (3) without separating out the e-commerce platform and logistics, establish a company website to carry out the e-commerce functions and to undertake the distribution via its own logistics department.

Most of traditional large-scale manufacturing and retail enterprises adopt the self-operated logistics type to realize online sales. The company's existing logistics network and customer advantage afford it a favorable basis for expanding its e-commerce logistics business. Haier Group in China is the typical representative company which adopts the self-operated distribution logistics system.

8.1.3.2 Logistics Operations of E-Commerce Service Providers

With the increasingly intensified competition in the e-commerce market, logistics has become one of the core competitive factors to e-commerce service providers, hence more and more e-commerce service providers began to offer logistics services. Since China has a large territory, most of the e-commerce service providers prioritize their logistics operations by focusing on certain key regions; they take on the logistics of some more important cities with the self-operated mode, and delegate the logistics service to other logistics firms in regions with relatively less online shopping. For example, amazon.cn has presently established distribution centers in Beijing, Shenyang, Xi'an, Suzhou, Wuhan, Chengdu and Xiamen, to offer various types of services such as regular express, evening delivery and appointment delivery, but entrust some third-party logistics (TPL) service providers to make delivery in other regions with less demand.

8.1.3.3 The Third-Party Logistics Mode

The third-party logistics mode refers to a form that industrial and commercial enterprises or e-commerce service providers entrust the third-party logistics service providers to carry out their logistics distribution services. Since more personalized logistics solutions can be realized through suitable contractual cooperation, this mode is widely adopted in B2B, B2C and C2C and is one of the logistics operations modes commonly taken by e-commerce service providers in China. For example, in C2C, both parties are consumers, and the transaction between them can only be achieved with the cooperation of third-party logistics enterprises.

8.2 Current Development of E-Commerce Logistics in China

In China, the e-commerce transaction market has expanded rapidly, both in market demand and in supply. This section introduces the current development of e-commerce market in China from the aspects of logistics demand, logistics supply, logistics network, service type, and industry policy.

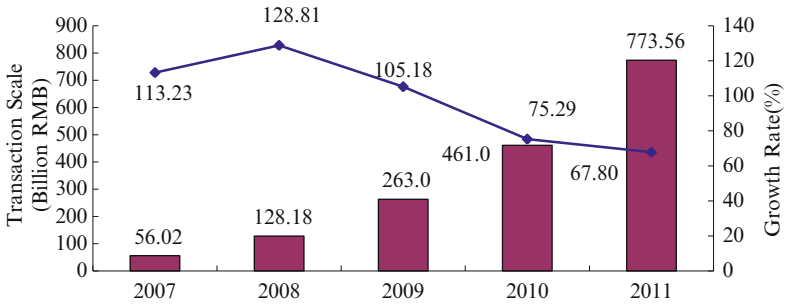

Fig. 8.2 Scale of online market transaction in China for 2007–2011 (Source: Compiled from the *China E-Commerce Research Report (2010–2011)* published by iResearch Consulting Group)

8.2.1 Logistics Demand

8.2.1.1 Scale of E-Commerce Transaction

From 2000 to 2008, the market of e-commerce in China had kept a steady and speedy growth of above 40 % every year. In 2009, due to the international financial crisis, some export-oriented B2B activities in China were noticeably affected; the volume of e-commerce transactions was 360 million RMB, increasing by 23.0 % year-on-year, which was the lowest growth in 10 years. In 2010, e-commerce transaction in China bounced back with the volume reaching 480 million RMB, equaling a growth of 32.4 % year-on-year. The rapid increase of e-commerce transactions has apparently led to the corresponding increase in the demand for e-commerce logistics.

From 2007 to 2011, the online shopping market, dominated by B2C and C2C, expanded tremendously, with the annual average growth rate of 92.7 %. In 2011, online market transaction reached 773.56 billion RMB in China, increasing by 67.8 % year-on- year. The scale of online market transactions in China from 2007 to 2011 is shown in Fig. 8.2. Since online shopping is a form of e-commerce in which consumers are directly involved, the transactions usually lead to prompt demand for logistics.

8.2.1.2 Magnitude of E-Commerce Users

E-commerce users include enterprises applying B2B transaction and consumers shopping online. In 2011, the Internet penetration rate in China reached 38.3 %, and the number of citizens on the Internet amounted to 513 million.[2] From 2003 to 2009 the number of small- and medium-sized enterprises utilizing third-party e-commerce

[2] *"The 29th Study Report on Internet Development in China,"* China Internet Network Information Center, CNNIC, January 2012.

platforms had boomed from below four million to over ten million. By December 2010, online users in China had exceeded 180 million,[3] which is the total number of online users in France, Germany and Canada.

8.2.1.3 Scale of E-Commerce Service Providers

The size of e-commerce service providers increases briskly both in number and scale. Up to June 2010, the number of e-commerce websites above designated size had reached 20,700, including 8,200 B2B enterprises and 12,500 B2C and C2C enterprises, representing an increase of 54.1 % and 79.5 % respectively, compared to those in 2009. With the rapid expansion of the scale of e-commerce transactions, some e-commerce enterprises also witnessed a tremendous expansion of their business scale. Take 360buy.com for sample, since its formal development of e-commerce service in 2004, the annual growth rate of its business has exceeded 200 % successively for the following 6 years.

8.2.2 Logistics Supply

Accompanying the rapid expansion of e-commerce market scale in China, e-commerce logistics supply has also increased persistently; in the process of rapidly enhancing their logistics services, express logistics enterprises have also continuously grown in strength.

8.2.2.1 Volume of Express Business

In recent years, the volume of express business in China increased greatly, with an annual growth rate exceeding 20 % each year. In 2011, express enterprises above designated size[4] in China realized a business volume of 3.67 billion pieces, increasing by 57 % year-on-year. Figure 8.3 shows the business volume of express enterprise above designated size in China for 2007–2011. The great majority of express service parcels result from online shopping in e-commerce. Among the people shopping online, about 90 % of the users choose EMS (Express Mail Service) or other non-state-operated regular express. In 2010, express parcels generated by e-commerce in China exceeded 2.9 billion.[5]

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[3] "*Investigation Report on E-commerce in China of 1997–2009*," the China e-Commerce Research Center (CECRC), http://b2b.toocle.com/, September 11, 2009.

[4] Statistics of "express enterprises above designated size" include only express enterprises with annual sales above 2 million RMB.

[5] "*Report on Development of E-commerce and Logistics in China*," Research Department of *Truck Logistics*, China Research Center of the Internet of Things, February 2012.

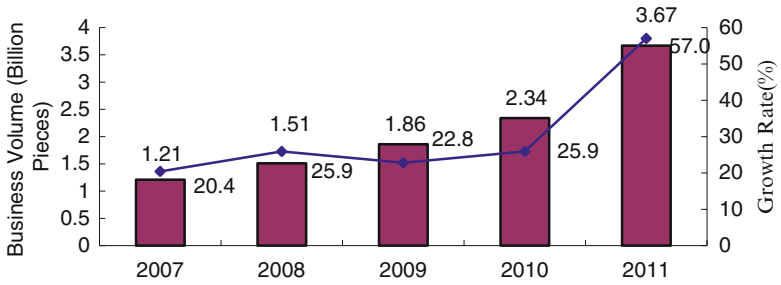

Fig. 8.3 Business volume and growth rate of express logistics enterprises above designated size in China for 2007–2011 (Source: Compiled from the *Operation of Postal Service Industry (2007–2011)* published by the State Post Bureau of China)

8.2.2.2 Types of Express Logistics Enterprise

In China, logistics enterprises can be categorized into the following three types: (1) Large-sized foreign-funded logistics enterprises such as FedEx, UPS, and DHL. Such enterprises are mostly capital and technology intensive enterprises with advanced management technology, and most often provide special B2B logistics service featuring high transaction volume, high price and special product type. (2) State-owned logistics enterprises, mainly including EMS (Express Mail Service), CRE (China Railway Express) and CAE (China Air Express). These enterprises feature substantial capital and extensive logistics coverage, and mainly process B2B, B2C and C2C logistics services with strict requirements on delivering time and higher price. (3) Private logistics enterprises, such as SF Express, Shentong Express and YTO Express, as well as numerous small- and medium-sized express enterprises. These enterprises are the main undertakers of online shopping logistics in China, which have the advantages of flexible operations and low prices.

8.2.3 Logistics Network

8.2.3.1 Service Range

Presently, e-commerce logistics enterprises have essentially established the logistics network covering the entire area of China. Large-sized logistics enterprises have basically set up the service network covering most regions of China, opened up international market extensively, and have better scale service capacity for B2B; small- and medium-sized private logistics enterprises focus on establishing logistics service network in major large- and medium-sized cities to meet the concentrated demand of online shopping e-commerce in such cities. Logistics network and spatial distribution characteristics of major e-commerce logistics enterprises in China are shown in Table 8.2.

Table 8.2 Service range of logistics network of some E-commerce logistics enterprises

Enterprise name	Enterprise type	Year established	Service range (within China, except for EMS)
EMS	State-owned	1980	Some 200 countries world-wide; more than 2,000 cities in China
Shentong Express	Private	1993	More than 800 outlets and 1,100 franchised outlets in large- and medium-sized cities
YTO Express	Private	2000	More than 1,200 cities
SF Express	Private	1993	More than 250 large- and medium-sized cities; 1,300 county-level cities and towns
ZTO Express	Private	2002	3,000 service outlets in large- and medium-sized cities
ZJS EXPRESS	Private	1994	3,000 outlets in more than 2,000 urban areas
YUNDA	Private	1999	53 regional transfer centers
TTK Express	Private	1994	Six wholly-owned subsidiaries in Beijing, Shanghai, Nanjing, Hangzhou, Wuhan and Dongguan; more than 200 franchised outlets and 2,000 outlets
HOAU	Private	1995	1,500 outlets
CNEX Express	Private	1993	736 outlets in 275 cities; providing door-to-door service in 380 large- and medium-sized cities

Source: Compiled from the "*Report on Development of E-commerce and Logistics in China,*" published by Research Department of *Truck Logistics* and China Research Center of the Internet of Things, February 2012

8.2.3.2 Mode of Logistics Network Expansion

Logistics enterprises expand their logistics service network mainly through cooperation, franchising and some other unique modes.

As for the cooperation mode, small- and medium-sized logistics enterprises typically cooperate with other logistics companies in areas where their network service is unavailable, and rely on the partners' facility and equipment to supplement their logistics service.

In terms of the franchising mode, some e-commerce express enterprises (such as Shentong Express and TTK Express) expand their service outlets by means of franchised chain to rapidly increase their outlets and realize nationwide coverage of the logistics network. The problem with franchising lies in the difficulty in upholding the service quality of the franchised outlet.

In addition, for certain special institutions with relatively concentrated demand, logistics enterprises often adopt a special mode of network expansion and service, such as the "Agency in Universities and Colleges" mode. Students in universities and colleges are one of the main groups of e-commerce consumption. Due to the intermittent semester time frame and the campus access restriction practice, it is often-time difficult for delivery staff to deliver the parcels to the recipients there. Some express companies (such as 360buy.com and YTO Express) have established on-campus agency locations, so that students can fetch their parcels from the agency locations, or return them there. Such special mode only exists in a few communities and enterprises.

8.2.4 Service Type

Diversity of demand, division of labor and intense competition fostered the incessant development of the following diversified service types and operations modes of e-commerce logistics enterprises in China.

8.2.4.1 Basic Service Products

E-commerce logistics enterprises generally promise to provide customers with choice of diversified services, including: (1) optional logistics mode, i.e., on some shopping websites, consumers can choose from the self-operated logistics mode offered by the e-commerce service provider, or the third-party logistics mode of delivery service; (2) optional service level, i.e., some e-commerce logistics enterprises offer customers a choice of logistics services at different speeds and types. For example, EMS offers next-morning delivery, next day, timed express (promise to deliver within the time period required by the customer), as well as other regular express services; (3) optional delivery time, i.e., some websites provide the service of delivering only on weekdays, holidays or in the evening, and other appointed time according to customers' requests.

8.2.4.2 Other Services

According to the particular attributes of online shopping, some e-commerce logistics enterprises offer other auxiliary services, including collecting payment of goods on delivery, picking up returned goods, notification of delivery with SMS, order status query, etc. Logistics service modes and auxiliary services of typical B2C and C2C enterprises are shown in Table 8.3.

8.2.5 Industry Policy

Mail service in China is wholly managed by the Government. China Post Group, as a large state-owned enterprise, is engaged by law in the proprietary operation of general mail service, and also participates in the commercial operations for competitive mail service. Its legal position in competitive market was ascertained gradually during the rapid development phase of express industry. In April 2009, *the Postal Law of the People's Republic of China* was enacted, which for the first time explicitly stipulated the business scope and entry system of private express enterprises, and specified the legal position of express enterprises.

The Chinese Government has been emphasizing, supporting and encouraging the rapid development of e-commerce and related logistics, by means of continual legislation of various policies. For example, in May 2010, SAIC (the State

Table 8.3 Logistics service and value-added services of typical B2C and C2C enterprises

Type	Logistics enterprise	Logistics mode	Service mode
B2C	360buy.com	Self-operation oriented	Collection on delivery, mobile POS swiping, picking up goods for return or exchange, order status query
	amazon.cn	Self-operation and outsourcing	Alert via SMS and mail, return and exchange service, timed delivery
	dangdang.com	Outsourcing oriented	Alert via SMS and mail, collection on delivery, 24 h customer service, 4 h special delivery in urban area of Beijing
	newegg.com.cn	Self-operation oriented	Optional computer installation, buyer pickup at community delivery outlet, collection on delivery, guaranteed 24 h delivery in some cities
	M18.com	Self-operation and outsourcing	Alert via SMS, return and exchange service
C2C	taobao.com	Outsourcing	Order status query
	paipai.com	Outsourcing	Order status query

Administration for Industry and Commerce of the People's Republic of China) released the *Tentative Management Measures on Transaction of Network Commodities and Related Service Conducts* to regulate the order of e-commerce logistics market. In 2011, the Government issued a series of policies relating to e-commerce express industry, as listed in Table 8.4.

In May 2012, China began to officially implement the *"Express Service"* series national standards (GB/T 27917), which elevated the standards of the express industry from industry-wide to the national level. These standards explicitly specified the supervision of franchising in express enterprises, the international service agency, the inspection and endorsement and other aspects. They further regulated the e-commerce logistics market and afforded a favorable basis for improving the express service level and promoting the transformation and upgrade of the express industry.

8.3 Problems in Development of E-Commerce Logistics in China

E-commerce in China has developed at an unprecedented pace, and altered the traditional mode of production, circulation and consumption. However, there are still many problems in e-commerce logistics industry to date, including the shortage of supply, high rate of complaints on logistics services, and imperfect supervision mechanism.

Table 8.4 Policies and main contents regarding postal express industry in recent years

Policy	Main contents
Measures for the Supervision and Administration of the Security of Postal Industry	It specifically regulates the responsibility for supervision and management of mail security, and particularly puts forth that enterprises shall carry out security surveillance on pick-up, sorting, transport and delivery links to prevent shortage, loss and damage of mail and parcel during delivery
Notice on issuing the Guidelines for Alteration of Business License of Express Service	It specifies the detailed requirements and processing mode for alteration of business license of express service
Notice on issuing the Measures for the Administration of Rating of Express Delivery Enterprises (for Trial Implementation)	It defines the rating issues of express delivery enterprises, and divides the express industry into four grade levels (A, B, C and D)
Guiding Opinions on the Merger and Restructuring of Express Delivery Enterprises	It clarifies the basic principles, main objectives and key contents of merger and restructuring of express delivery enterprises set by the government
Notice on issuing the Measures for Treatment of Customer Complaint in Postal Industry	It regulates the complaint response agency and its responsibility, complaint acceptance conditions and treatment, investigation, as well as conciliation
Notice on Issuing the Operations Instructions of Express Service	It puts forth guiding opinions on the pick-up, sorting, transport and delivery, as well as information recording links
Guiding Opinions of the State Post Bureau on the Promotion of Scientific and Technological Progress in Postal Industry in 2011	It guides and strengthens the scientific and technological progress in postal industry by means of preparing planning, carrying forward standards, raising standings, and building platforms
The Express Service National Standards (GB/T 27917)	It specifies the aspects of franchising management, international service agency, trans-provincial business qualification, recompense, complaint, inspection and endorsement of different express delivery enterprises

8.3.1 Shortage of Supply

In China, the service capacity of e-commerce logistics has yet to be augmented; the capacity insufficiency is shown specifically in several areas. (1) It is hard for logistics services to meet the demand of online shopping at peak season during holidays, resulting in prolonged waiting time for customers; some e-commerce enterprises have had to inform customers in advance of delivery stoppage on holidays. This was called the "capacity burst" of the logistics enterprises. (2) The enterprises have inferior integrated and professional service capability. First, the logistics service design capability is generally weak, and presently only few third-party

logistics enterprises can provide total logistics solutions for the e-commerce service providers. Secondly, professional logistics service capability of logistics enterprises is poor, especially due to their outdated supporting service capability in packaging, and safeguard for cold chain, and the high risk in mishandling fresh products, luxury goods and fragile products.

8.3.2 High Rate of Complaints on Logistics Services

In China, the service level of e-commerce logistics is relatively low, which causes a high rate of service complaints. According to the *Monitoring Report on E-commerce User Experience and Complaint in China* released by the China E-Commerce Research Center in 2012, China E-commerce Complaint and Rights Public Service Platform recorded nearly 100,000 e-commerce complaints in 2011. The major complaints covered the following hot issues: (1) late issuance of order shipment, (2) order cancellation by merchant, (3) incorrect order fulfillment, (4) product loss and damage, (5) slow delivery and failure in meeting the promise, and (6) difficulty in returning merchandise.

8.3.3 Imperfect Supervision Mechanism

Presently, e-commerce logistics is still plagued with problems of imperfect supervision mechanism. For example, a consumer who has problems with goods purchased through e-commerce from another city must file the complaint to that city's local industry and commerce authority. The long-distance contact between different locations causes difficulties to the consumer and results in ineffective resolution of the complaint. Another example in C2C is that the legal market standing of many online shops is difficult to ascertain and the shipper's actual address is unavailable, which create difficulty in supervision by the government.

8.3.4 Continuous Rise of Logistics Cost

Along with the continuous upswing of fuel price, land price and labor cost, the operating cost of e-commerce logistics enterprise continues to rise. Among all factors of operating cost, the labor cost of express industry increases the fastest. For regional franchised enterprises of ordinary e-commerce, oil price and labor cost account for about 10 % and 50 % of the total operating cost respectively. Since the series of new "*Express Service*" national standard was implemented in 2012, stricter operations

standards were put forth for the express industry. Certain kind of improvement on service standards, such as allowing customer to "examine goods before signing off," hike up the cost of logistics enterprise furthermore.

8.4 Development Tendency of E-Commence Logistics

E-commerce transaction develops rapidly and apparently has a huge market potential in China. Along with the expanded scale of Internet users, the improvement of technological level and the innovative development of business model, the development of e-commerce logistics will be accelerated furthermore. In this section, the development tendency of e-commerce logistics in China is discussed, including the expansion of market scale, the integration via merger and acquisition, and the improvement of operational and management level.

8.4.1 Rapid Expansion of Market Scale

The increasing e-commerce market demand will definitely boost the market scale of e-commerce logistics. First of all, the Government attaches great importance to the development of e-commerce, and has explicitly put forth in the "12th Five-Year Plan" various measures to encourage online payment and the construction of infrastructure and logistics distribution centers relating to e-commerce. Secondly, with the economic development and the improvement of the income level of China's populace, consumption capability in Chinese market will be enhanced continually. Hence, the demand scale of e-commerce logistics will be enlarged continuously owing to the gradual popularization of Internet. Thirdly, large-scale venture-capital investment groups have invested enormous sums of money in the e-commerce field. For example, from 2007 to 2011, 360buy.com successively received multi-round of investments from Capital Today, Bull Capital, Tiger Fund, Digital Sky Technologies and other enterprises, with the total investment exceeding 680 million USD; VANCL and dangdang.com also acquired multiple venture-capital investments.

8.4.2 Increase in Ratio of Self-Operated Logistics of E-Commerce Service Providers

To improve their logistics service level, many e-commerce service providers are shifting from outsourcing logistics of the earlier stage to the self-built logistics network, establishing distribution centers, especially around cities with relatively

concentrated demand in southeastern coastal areas, to realize self-operated logistics. For example, previously dangdang.com had cooperated with more than 100 private express companies in 66 cities in China to distribute all its products by these third-party logistics enterprises. However, dangdang.com has now begun to build its own distribution centers and logistics system.

8.4.3 Increasingly Intense Market Competition and Further Accelerated Integration

At present, China has a great many small- and medium-sized online shopping logistics enterprises on the market and the competition among them is fierce. Discerning the raging expansion of e-commerce market in China, foreign-funded express enterprises and large-sized state-owned enterprises begin to enter the online shopping e-commerce logistics market. Integration of e-commerce logistics market will conceivably be further accelerated. The integration includes several main types. First, more and more large-sized manufacturing and retail enterprises step into the e-commerce field and integrate e-commerce logistics enterprises by means of merger and acquisition. For example, in October 2010, GOME acquired 80 % shares of Coo8.com at 48 million RMB to formally enter the e-commerce and logistics field. Secondly, large-scale foreign-funded or local enterprises acquire small- and medium-sized logistics enterprises. In 2010, China had 11 cases of merger and acquisition in logistics industry; in the first quarter of 2011, the number of merger and acquisition cases in logistics industry hit a record high of seven in a quarter, and the amount of funds for merger and acquisition reached 111 million USD. Thirdly, large scale e-commerce service providers begin to acquire logistics network through merger and acquisition. For example, alibaba.com acquired Vendio, Auctiva and Shenzhen Datong in 2010 to further expand its customer base and export logistics services.

8.4.4 Further Standardization of Logistics Operations

The Chinese Government places great emphasis on e-commerce logistics operations, and has continually formulated and released related laws, regulations, plans and standards to standardize the operational mode of e-commerce logistics enterprises, and has gradually resolved many problems that emerged during the hasty development of e-commerce logistics. The release and implementation of the series of "*Express Service*" national standards, as well as further substantiation of various regulations concerning e-commerce logistics, have gradually established a sound legal ground for e-commerce logistics operations, further regulated the market order, and more effectively protected the interest of investors and consumers.

8.4.5 Gradual Improvement of Innovation Capacity

E-commerce transaction possesses the characteristics of diversified operational modes and frequent adoption of new technology; consequently, e-commerce logistics service must adapt to the constant development of e-commerce and strengthen its innovation capability. Presently, several new types of e-commerce begin to emerge in China, and the market of mobile network (including 3G), Social Networking Services (SNS), micro blog e-commerce, and e-commerce search engine are spreading briskly. In this context, e-commerce logistics enterprises are mandated to further improve their flexibility and adaptability. However, e-commerce logistics enterprises in China still lack the ability to properly adapt to new e-commerce modes, and are in need of improving their logistics innovation capability.

8.5 Summary

This chapter presents a comprehensive discussion of the recent development of e-commerce in China, covering the characteristics of self-operated and outsourcing modes of e-commerce logistics, the current status of various forms of e-commerce logistics operations, the existing shortcomings in the system and the future outlook of e-commerce in China. It is noted in recent years that the scale of logistics demand for e-commerce has expanded rapidly, the volume of express business has grown swiftly, logistics networks were established in various forms, diverse business types emerged constantly, and the industry policy on e-commerce was improved accordingly. Problems for express logistics industry in China due to shortage of service supply, high complaint rate, imperfect supervision mechanism, and incessant rise of operating cost are in need of attention. As for the future trends of e-commerce in China, it is expected that the e-commerce logistics market scale will expand persistently and rapidly, the ratio of self-operated logistics by e-commerce service providers will rise gradually, the competition will be intensified, and the market integration will be further accelerated. With the increasingly diversified e-commerce demand, e-commerce logistics market will expand with ever-progressing innovations.

Chapter 9
Development of Chain Business Logistics in China

Xiang Li

Presently, chain operation is the most dynamic mode of operation in commodity circulation industry. With the deepening reform of the circulation system, chain business develops rapidly in China with much contribution to China's recent economic growth. Logistics provides a pivotal support for the operation of chain business, and its performance is directly related to the efficiency and benefit of chain business. Development of chain business logistics is not only a necessary means to strengthen the core competitiveness of China's business enterprises, but also a pressing mandate to improve the development of China's logistics.

This chapter comprises three sections aimed to portray the development of chain business logistics in China. The first section introduces the market environment of chain business logistics in China, the second section describes the current development of chain business logistics, and the third section discusses the future development trend of chain business logistics in China.

9.1 Development Environment

In the early 1990s, with the reform of China's business organization, the operations mode of chain business began to emerge China. After more than a decade of evolution, chain business has dominated the retail market of large and medium-sized cities in China. In recent years, chain business witnesses a marked trend of rapid growth and continual expansion of the business scale, which has led to much higher requirements on the chain business logistics system. Particularly, during the crucial period of transformation and upgrading of China's consumer market, chain business logistics has been endowed with a favorable development environment and great opportunity.

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Current Chinese Economic Report Series, DOI 10.1007/978-3-642-34525-8_9,

Table 9.1 Scale of retail chains for 2006–2010

Indicator\Year	Number of stores (thousand)	Employees (million)	Business area (million square meter)
2006	128.9	1.87	90
2007	145.4	1.86	100
2008	168.5	1.97	102
2009	175.7	2.11	118
2010	176.8	2.25	128

Source: Compiled from the *China Statistical Yearbook* (2011), published by the National Bureau of Statistics of China

9.1.1 Market Environment

9.1.1.1 Continually Enlarged Business Scale

Chain business has evolved rapidly in China, and the business scale has expanded continually. In 2010, the number of Chinese chain stores of retail business[1] reached 176,800, with a total business area of 128 million square meters and the number of employees over 2.25 million. These three indicators grew by 37.2 %, 42.2 % and 20.3 %, respectively, compared to with those in 2006, as shown in Table 9.1.

Furthermore, data from the China Chain Store & Franchise Association[2] indicates that the total number of stores of top 100 chain enterprises[3] reached 150,000 in 2010, increasing by 9.8 % compared with that of 2009. Total sales of the top 100 enterprises amounted to 1.66 trillion RMB, accounting for 11 % of total retail sales of consumables; this sales figure represents an upswing by 21.2 % compared with that of 2009, which is 7.7 percentage points higher than the growth rate of 2009.

9.1.1.2 Status of the Diversified Industry

Chain business makes continual expansion in China with the coverage spreading across various fields of retail industries. Especially in recent years, with the stimulus of the opening-up policies on the automobile market and the reform of health care system, market demand for automobiles, medicines and other products have risen; specialty chain stores such as auto shops, pharmacies have developed rapidly. A categorical snapshot of retail chain industry in China in 2010 is shown in Table 9.2.

It can be seen from the broad categories of industries that chain business in China has developed from the supermarket initially, into other industries such as specialty chain stores, franchised stores and convenience stores. And the earliest supermarket

[1] Refers to the retail chains with annual sales over five million RMB and the number of employees equal to or over 60 by yearend.

[2] *China Chain Store Almanac 2011*, published by the China Chain Store & Franchise Association, China Business Press, July 2011.

[3] Refers to the top 100 national chain enterprises in terms of sales volume.

Table 9.2 Categorical data of retail chain industry in 2010

Type of industry		Number of main stores	Number of retail stores	Employee (thousand)	Business area (million square meter)
General retailing		841	62,657	1,377	59.695
Specialized retail	Food, beverage and tobacco	137	8,553	45	0.492
	Textile, apparel and daily necessities	130	12,184	63	1.278
	Cultural and sporting goods and equipment	79	2,018	45	1.629
	Medicine and medical equipment	538	31,049	176	3.487
	Automobile, motorcycle, fuel and accessories	171	16,428	156	27.518
	Household appliance and electronic product	192	3,165	132	7.599
	Hardware, furniture and indoor decoration material	17	116	9	0.693
	Others	24	458	4	0.071

Source: Compiled from the *China Statistical Yearbook* (2011), published by the National Bureau of Statistics of China

Table 9.3 Distribution of chain industry in 2010

Type of industry	Number of retail stores	Employees (thousand)	Business area (million square meter)	Sales volume (billion RMB)
Specialty store	84,678	831	67.55	1,723.32
Franchised store	58,681	455	51.92	1,289.55
Supermarket	39,140	886	37.68	568.60
Department store	4,239	250	14.81	267.15
Convenience store	14,202	75	1.07	24.66
Others	6,784	30	1.33	41.90

Source: Compiled from the *China Statistical Yearbook* (2011), published by the National Bureau of Statistics of China, and revised draft of *National Standard on Classification of Retail Formats* (2010)

has progressed from single-type large supermarket to multi-type supermarket, including large supermarket, general supermarket, community supermarket, fresh food supermarket, etc. At present, a diversified chain business pattern founded primarily on specialty store, franchised store and supermarket, and supplemented by department store and convenience store has basically taken shape in China. Table 9.3 shows the sales volume, number of retail stores, business area and employees in various forms of chain industry in 2010.

In order to adapt to the diversified needs of the consumers, chain enterprises are actively upgrading the industrial structure on the basis of market segmentation.

For example, the "OLE" supermarket under Vanguard chiefly focuses on high-end consumers, and its stores are mainly located in posh business areas, office buildings and residential areas in Shanghai, Beijing and Shenzhen. Over 40 % of its products are directly imported from abroad; and it has undergone noticeable upgrade over the traditional supermarket in terms of product positioning, product mix, and service functions. Suning Appliance has set up flagship stores of the fifth generation electronic products in Guangzhou, Nanjing, Wuhan and other cities and upgraded its traditional comprehensive household appliances stores into the intelligentized, diversified and experience-based stores in terms of their functions.

9.1.1.3 Trans-Regionally Expanded Large and Medium-Sized Enterprises

Chain enterprises in China have gained an increasingly apparent momentum in trans-regional expansion; especially, since markets in the first-tier cities are getting saturated, many chain enterprises with reasonable scale began to explore markets in tier 2, 3 and 4 cities. For example, Suning Appliance and Gome Electrical Appliance had set up over 600 new chain stores in tier 3 and 4 cities in 2011, and "Suremoov" automobile maintenance chain announced that it would set up after-sales market service stores in "China's top 100 counties."[4]

Furthermore, chain enterprises also explored markets in rural areas and actively participated in the construction of rural market circulation channels by way of setting up direct-sale chain stores or franchises, building and transforming agricultural bases and distribution centers. By the end of 2010, 520,000 chain farmer's stores were set up across the country for agricultural products and materials; 2,667 associated distribution centers were established throughout the country, covering 80 % of the villages and towns and 65 % of the administrative villages of China. Meanwhile, through production-to-sales linkage with specialized farmers' cooperatives, most of the chain supermarkets have become the terminal receptor of the "Producer to Supermarket" circulation pattern of agricultural products, and the organizers and participants of the national demonstration project of "Connecting Farmers' Cooperatives and Supermarkets." The expanding scope of chain business sphere has created a huge demand for the chain business logistics.

9.1.1.4 Diverse Forms of Ownership in Competition

Along with the deepening reform of the economic system in China, chain business exhibits a tendency of diversification of business entity, branding of business, internationalization of competition and professionalization of management. As

[4] "China's top one hundred counties" were objectively selected through estimation and assessment by the National Bureau of Statistics on comprehensive social and economic development, based on social and economic statistics of over 2,000 counties across the country.

Table 9.4 Business status of some major foreign-funded chain enterprises in 2010 (According to the related rules in P.R. China, the statistics incorporate companies, enterprises and other organizations or individuals in Hong Kong, Macao and Taiwan as well as enterprises set up in China Mainland by Chinese citizens living abroad with sole ownership of all capitals.)

Name of enterprise	Number of stores	Growth rate (%)	Sales volume (billion RMB)	Growth rate (%)
Kangcheng Investment (China) Co., Ltd. (RT-Market)	143	18.2	50.23	24.2
Carrefour (China) Management Consulting Services Co., Ltd.	182	16.7	42.00	14.8
Wal-Mart (China) Investment Co., Ltd.	219	25.1	40.00	17.6
Yum! Brands Inc., China Division	3,500	9.4	33.60	16.7
Best Buy Solutions, Inc. (China Mainland)	277	5.7	27.00	5.1
New Word Department Store China Limited	37	8.8	17.90	19.3
Parkson Retail Group Limited	47	6.8	16.56	33.9
Trust-Mart Management Consulting Service (Shanghai) Co., Ltd.	104	0.0	16.50	0.0
Tesco China	109	38.0	15.90	19.5
Lotte Mart (China Mainland)	80	2.6	14.45	18.1

Source: Compiled from the *China Chain Store Almanac 2011*, published by the China Chain Store & Franchise Association, China Business Press, July 2011

well-known domestic chain enterprises are swiftly developing, foreign-funded chain businesses also accelerate their development in the Chinese market. In 2010, among the top 100 chain enterprises, 21 are foreign-funded; of which five large supermarkets set up 140 new stores, increasing by 22 % compared with the previous year. The growth rate of newly-established stores of six foreign-funded enterprises exceeds 20 %. The status of some major foreign-funded chain enterprises in 2010 is shown in Table 9.4.

9.1.1.5 E-Marketing as Hot Spot of Development

With the rapid development of e-commerce in China in the past decade, many traditional chain enterprises have actively developed corresponding network sales business and resulted in enhanced profit margins. Owing to a variety of entity their large number of physical business outlets, traditional chain enterprises have more advantages than regular e-commerce enterprises in terms of procurement, logistics, after-sales service, brand and capital. Among the top 100 chain enterprises in 2010, 34 enterprises have branched out to network retail business and realized a total sales volume of about 3 billion RMB .[5]

For example, Bailian Group launched its B2C e-commerce platform “Blemall.com” in December 2009, to provide online shopping, nearby pick-up and home

[5] “Investigation and Analysis on Top 100 Chain Enterprises of China in 2010,” China Chain Store & Franchise Association, July 2011.

delivery services; "Suning.com" was officially launched by Suning Group in February 2010, achieving an average daily sales volume of 3 to four million RMB. In addition, some chain enterprises are strengthening their network marketing capability through cooperation with e-commerce enterprises. For example, besides its self-built online shopping mall, Gome Electrical Appliance also established the "Gome Electrical Appliance Mall" on dangdang.com by associating with Dangdang and committed to providing shoppers with the same quality services of Gome online shopping mall in terms of goods delivery, installation, after-sales service, etc.

On the whole, network marketing of chain enterprises had a late start, but has since developed briskly, which has brought about much higher requirements for the functions and service levels of chain business logistics. Hence, establishing an effective logistics system has become the crucial pathway for chain enterprises to conduct network marketing business.

9.1.2 Policy Environment

9.1.2.1 Policy on the Reform of Circulation System

With the deepening reform of the circulation system reform in China, relevant regulations and policies for accelerating construction of a modern business circulation system have been successively issued, which points to head the direction for the development of chain business logistics. The "National Meeting on Promoting Circulation Modernization" was held in Shanghai in January 2002, in which chain operation was determined as one of the three priorities in promoting circulation modernization in China. In September of the same year, the *Circular of Several Opinions on Promoting Development of Chain Business* was issued by the State Council. An overall plan was made in the *C*ircular to accelerate the construction of chain logistics delivery system and raise the proportion of centralized purchasing and distribution of goods in chain enterprises. In October 2003, it was pointed out in the *Decision of the Central Committee of the Communist Party of China on Some Issues Concerning the Improvement of the Socialist Market Economy* to develop e-commerce, chain operation, logistics distribution and other modern circulation modes, so as to promote the adjustment of development strategy of circulation industry in China.

9.1.2.2 Policies on the Development of Chain Logistics for Agricultural Materials and Products

In June 2004, the General Office of the State Council released the *Guidelines on Further Improving Rural Commodity Circulation*, with the requirements to vigorously develop chain supermarket, convenience store types of circulation business, to reform the traditional trade markets in rural areas through chain operation, joint

distribution and other modern operation modes, and to actively develop chain operation for agricultural materials.

In 2005 and 2006, the Ministry of Commerce respectively carried out the "Ten Thousand Villages and One Thousand Townships" Market Project and the "Two Hundred Markets" Project, giving priority to develop modern circulation network in rural areas. In May 2006, the Ministry of Commerce approved the *Specification for Construction and Reform of Countryside Stores,* which mandates accelerating the development of retail chains of agricultural products and corresponding logistics system and encouraging the establishment of retail stores to sell agricultural production materials in the form of chain operation.

In December 2008, the Ministry of Commerce and the Ministry of Agriculture jointly issued the *Circular on Carrying out Pilot Project of Linking Farmer's Cooperative and Supermarket,* which supports chain enterprises to accentuate the advantages of networking, informatization, and distribution to set up a new-type of supply chain for fresh agricultural products; and to carry out the pilot project of "Linking Farmer's Cooperative and Supermarkets" for fresh agricultural products via selected large chain enterprises in some large and medium-sized cities.

In November 2009, the State Council issued the *Guidelines on Accelerating Reform and Development of Supply and Marketing Cooperatives*, which purports to strengthen the construction of regional logistics distribution centers, chain supermarkets, convenience stores and rural retail terminals.

9.1.2.3 Specialized Policies on Logistics

In March 2009, the State Council issued the *Adjustment and Development Plan of Logistics Industry*. It was emphasized in the following actions: to develop cold-chain logistics of agricultural products and improve chain operation network of agricultural materials and rural consumables; to develop joint distribution in urban areas and improve the logistics distribution efficiency of food, salt, tobacco and publications; to carry out centralized purchasing and joint distribution of medicines to promote the development of medicine logistics; to develop key projects of delivery in urban areas and encourage enterprises to utilize modern logistics management technology so as to adapt to the development needs of e-commerce and chain business, develop socialized common distribution oriented to circulation enterprises and consumers in large and medium-sized cities.

In April 2010, the Ministry of Commerce issued the *Opinions on Improving the Circulation System of the Production Materials.* It was highlighted in the *Opinions* to develop modern circulation patterns of chain operation, e-commerce, and logistics distribution, in accordance with commodity features, regional advantage and actual condition of the enterprises.

In March 2011, the Ministry of Commerce, the National Development and Reform Commission (NDRC) and the All China Federation of Supply and Marketing Cooperatives (ACFSMC) jointly issued the *Project Planning for Business Logistics Development*, which declares to support the construction of large chain

enterprises and the reformation of modern logistics distribution center, to develop joint distribution and refine the level of logistics distribution of chain enterprises. It also puts forward corresponding specific targets and assurance measures. Moreover, policies and regulations on logistics in the fields of automobile, medicine, and agricultural cold chain have been or will be issued to guide the continuous development of chain business logistics.

9.2 Current Development

With the increasing on-going improvement of the market and policy environment, chain business logistics in China develops rapidly, mainly in the following aspects: the scale of chain business logistics is continually expanding; the intensification of logistics is significantly improved; the cooperation between the third-party logistics and chain enterprises is further enhanced; the supporting role of modern logistics technology is increasingly evident; the coordination and collaboration within supply chain is further deepened.

9.2.1 Demands for Chain Logistics

Along with the expansion of their scale, chain business enterprises in China vigorously developed circulation patterns such as centralized purchasing, joint distribution, thus creating a considerable market demand for chain business logistics. Table 9.5 shows the status of demand for logistics of national chain retail enterprises for 2006–2010.

What's more, the scale of chain business logistics for certain hot consumption industries has also been expanded rapidly, particularly those involving food,

Table 9.5 Status of demand for logistics of chain retail enterprises

Indicator	Sales volume of commodity (billion RMB)	Amount of purchased commodity (billion RMB)	Amount of purchased commodity through joint distribution (billion RMB)	Amount distributed by self-built distribution center (billion RMB)	Amount distributed by non self-built distribution center (billion RMB)
2006	1,495.22	1,344.74	1,056.57	772.97	138.40
2007	1,775.43	1,591.70	1,254.24	905.70	170.73
2008	2,046.65	1,719.31	1,378.21	865.49	311.88
2009	2,224.00	1,934.37	1,472.31	—	
2010	2,738.54	2,404.46	1,741.25	—	

Source: compiled from the *China Statistical Yearbook* (2009–2011), published by the National Bureau of Statistics of China

Table 9.6 Demand for logistics of chain retail enterprises in various industries in 2010

Item		Annual sales of commodity (billion RMB)	Amount of purchased commodity (billion RMB)	Commodity through joint distribution (billion RMB)
Comprehensive retail		1,078.99	902.65	532.04
Specialized retail	Food, drink and tobacco products	21.44	17.88	15.67
	Textile, apparel and daily necessities	25.55	18.74	14.36
	Cultural and sporting goods and equipment	37.68	38.89	37.44
	Medicines and medical appliances	43.73	38.44	33.88
	Automobile, motorcycle, fuel and accessories	622.86	551.53	450.08
	Household electrical appliances and electronic products	176.88	173.21	134.56
	Hardware, furniture and indoor decoration material	6.74	3.85	2.90
	Others	1.49	1.36	1.28

Source; compiled from the *China Statistical Yearbook* (2011), published by the National Bureau of Statistics of China

household electrical appliances, medicines, and automobiles. For example, in 2010, the sales volume of household electrical appliances and electronic products of chain enterprises in China increased by 16.5 % compared with the previous year and the volume via joint distribution increased by 33.8 %. Data of sales volume of chain enterprises in various industries for 2010 are shown in Table 9.6.

9.2.2 Construction of Logistics Distribution Centers

With the expansion of business scope and geographical radius, large chain enterprises begin to successively hasten the construction of logistics distribution centers, thus enlarging the scale and improving the functions of their distribution centers. By the end of 2009, national chain retail enterprises possessed 3,426 distribution centers for various commodities; the volume of commodity distributed to chain enterprises through distribution centers amounted to 1.2 trillion RMB, and over 90 of the top 100 chain enterprises have established their own logistics distribution centers.

For example, Suning Appliance, ranking first among the national top 100 chain enterprises, had built three major logistics bases in Beijing, Hangzhou and Jiangsu. In 2010, Suning Appliance acquired the land for construction of logistics bases in Jinan, Qingdao, Hangzhou, Yancheng, and signed contracts for 12 reserved

projects. Walmart (China) also successively established large logistics distribution centers with a total area exceeding 40,000 square meters in Shenzhen, Tianjin and Jiaxing and it is now planning to build the fourth logistics distribution center in Sichuan Province. In May 2010, the Huabei Distribution Center of Wu-mart located on Beijing's East 5th Beltway was officially put into operation, covering an area of 70,000 square meters and with an annual distribution capacity of 7.45 billion RMB, and it is the largest logistics distribution center of chain retail industry in North China.

Accompanying the construction project, many chain enterprises also strengthened and improved the refrigeration, fresh food processing and other functions of their distribution centers. For example, the construction area of fresh food processing and distribution center of Lianhua Supermarket in Shanghai covers 35,000 square meters, with an annual capacity of 20,000 tons, to handle 1,200 types of products in 15 categories. By 2011, 80 of the national top 100 chain retail enterprises of fast-moving consumables had established independent fresh food distribution centers (65 of which have already been completed and 15 were under construction). Most of the enterprises employing fresh food distribution centers can deliver commodities to retail stores twice or more times daily.

9.2.3 Integration of the Circulation Channel

Many chain enterprises order goods directly from the upstream distributors or manufacturers and bypassed the small and medium-sized wholesalers, which expands the scale of purchasing through centralized purchasing and joint purchasing. This operating mode is conducive to the integration of chain business logistics and the optimization in product mixing, sorting, distribution and information processing in circulation channel, and thus greatly improves the concentration level of chain business logistics. For agricultural products, in particular, many large chain supermarkets fortify their efforts on the "Linking Farmer's Cooperative and Supermarket", and the "Purchasing Directly from Bases" initiatives, and thus further shorten the circulation channel and reducing the logistics cost.

For example, Beijing CSF Market has engaged in the "Linking Farmer's Cooperative and Supermarket" initiative with over 70 agricultural cooperatives throughout the country. Among the fresh produces of CSF Market, 80 % of the vegetables and 50 % of the fruits are purchased directly from production bases. CSF Market carries out joint distribution mainly to direct chain stores in other cities (Chengde, Zhangjiakou, Xuanhua, etc.) and adopts the "two-way logistics mode" to combine the tasks of distributing commodity to chain stores and purchasing agricultural products. That is, each day haulage vehicles of logistics centers will first distribute commodity to retail stores in other cities then the vehicle will swing by the nearest agricultural cooperatives to pick up goods, before returning to the center. Logistics resources can be fully utilized and integrated by adopting this mode, thus reducing logistics cost and improving logistics efficiency.

9.2.4 Cooperation with Third-Party Logistics Enterprises

With the improvement of the capacity and level of services provided by the third-party logistics enterprises, chain enterprises in China have bolstered their cooperation with the third-party logistics enterprises to fulfill chain distribution. For example, Gome outsources most of its distribution to the third-party logistics enterprises and uses its self-owned vehicle fleet only for bulk distribution among retail stores. Gome has set up a sophisticated assessment system for screening the third-party logistics enterprises and also signing standardized service contracts with multiple carriers to ensure the quality of logistics service.[6]

Some chain enterprises also establish strategic alliances with the third-party logistics enterprises and continually expand the cooperation in terms of depth and breadth. For example, Jingong Supermarket integrates its advantage in community commercial network with the logistics distribution advantage of Tianjin Traffic Group to establish a stable strategic partnership. In March 2009, the two parties jointly established the Tianyuntong Logistics Co., Ltd. dedicated to undertake the distribution business of Jingong Supermarket, so that all of the deliveries to its 356 retail stores can be accomplished by only 14 medium-sized vehicles. In 2011, Jingong Supermarket and Tianjin Traffic Group jointly set up a fresh food distribution center, marking a new phase of deeper cooperation between the two parties.

9.2.5 Automation and Informatization

9.2.5.1 Logistics Equipment

Chain business in China has made significant progress in logistics equipment and technology and brought in great improvement in mechanization and automation of the logistics facilities. Many chain enterprises have set up modern logistics centers with considerable scale and high-level modernization. They have adopted modern logistics equipment and technology such as high rack, sorting production line, stacker, forklift and pallet, electronic tag, bar code and radio frequency, to improve the mechanization and automation of the logistics operations.

For example, Wu-mart's newly established Huabei Distribution Center adopts various modern logistics equipment and technology. The distribution center is equipped with 99 forklifts of various types, 32,000 pallet racks, 200 sets of handheld radio frequency terminal and sorting system with the functions like speedy sorting and transport, automatic weighing and detection as well as electronic tag sorting. The distribution center also has advanced cold-chain logistics storage, with the designed daily distribution quantity of fruit and vegetable storage of 300 tons and

[6] "Report on China's E-commerce and Logistics Development of 2012," Research Department of *Truck and Logistics,* Research Center of Huaxia Internet of Things.

that of the refrigeration storage of 12,000 pieces. This distribution center provides efficient logistics distribution service not only for all chain stores in Beijing, but also for part of the chain stores in Tianjin and Hebei.

9.2.5.2 Logistics Information Technology

The application of logistics information technology to chain business is constantly strengthened in China. Chain enterprises commonly utilize the logistics information systems and further explore technology of information sharing and docking, data analysis and data mining, etc. According to the report jointly issued by the China Chain Store & Franchise Association and Accenture, 90 % of the sample chain retail enterprises in the survey have adopted purchasing management system, 91 % of them have adopted POS (Point of Sale) and tagging system, 80 % of them have carried out inventory planning and adopted replenishment management system, and 92 % of them have adopted customer order management information system.[7]

For example, by adopting the SAP-ERP management information system, Wu-mart effectively realizes the informatization along its supply chain links in customer demand forecasting, procurement operations, supplier management, operation of logistics distribution centers, and transportation management. With the support of the SAP-ERP management information system, the distribution center can also conduct assessment and management over logistics carriers according to set targets on service, damage rate, settlement, cost, and delivery accuracy, thus effectively reduce the transportation cost and improving distribution quality.

9.2.6 Supply Chain Collaboration

Chain business in China actively adopts supply chain collaboration to improve logistics operation efficiency of the whole channel by various means. Specific means of collaboration between chain business enterprises and suppliers include: jointly designing the process flow of supply chain; jointly setting targets for inventory turnover, shortage rates and logistics cost control; jointly conducting sales forecast and common procurement plan; establishing information sharing mechanism for data, jointly improving application of logistics technology, and jointly making plan on loss prevention and protection.[8]

For example, in 2005, the Wu-mart Group established strategic partnerships with Yanjing Beer, Uni-President, Yili, P&G and other brand suppliers to provide them with support in information sharing, and inventory analysis. In 2006, Suning Appliance achieved docking with Motorola's IT system, thus sharing information

[7] "IT Benchmark Research Report of Chinese Retail Industry 2010," China Chain Store & Franchise Association, July 2011.

[8] "Major discoveries in research on distribution of China's chain retail industry in 2010," China Chain Store & Franchise Association, July 2011.

on demands and inventory of Suning retail stores with Motorola. It also leveraged Motorola's regional inventory distribution system to perform collaborative forecasting, advance replenishment and direct store fulfillment, thus significantly improving the logistics efficiency. In 2010, P&G Company developed the "P&G-Wal-Mart Palletized Transport Pilot Project" with War-Mart (China) Company. Upon implementation of the project, War-Mart's distribution center doubled its processing capacity and shortened the processing time of the whole supply chain by one day without incurring additional logistics cost

9.3 Problems and Development Trend

Chain business logistics has recently enjoyed a rapid development in China, but there still exist some problems including comparatively low level of joint distribution, lagging development in specialized logistics services and lacking in implementation and deepening of policies. With the improving development environment and logistics technology, chain business logistics in China will maintain a good development momentum in the future. Chain logistics functions in certain key realms will be strengthened, socialized logistics services will be broadly applied and supply chain collaboration will be deepened.

9.3.1 Problems

9.3.1.1 Comparatively Low Proportion of Joint Purchasing and Distribution

The advantage of chain business lies in the reduction of logistics cost through joint ordering and distribution, thus increasing the enterprise's competitive strength. However, hampered by the operational concepts, management level, hardware capability, etc., part of some small and medium-sized chain enterprises in China still implement operate under the traditional mode of single-store purchasing and stocking by individual stores, hence, the proportion of joint distribution is comparatively low and advanced logistics management modes, such as cross-docking, common-delivery, and vendor-manage-inventory, have not been widely used yet. At present, the proportions of joint distribution in above-the-scale[9] chain supermarkets and the "thousands of villages" countryside stores in rural areas are respectively about 63.4 % and 50 %; there is still a large gap between these numbers and the average of 80 % for developed countries.

Therefore, in March 2011, the Ministry of Commerce, NDRC and ACFSMC jointly issued the *Project Planning for Business Logistics Development*. The goal of the Project is to raise the joint distribution rate of above-the-scale chain

[9] Above-the-scale merchandising enterprises refers to wholesale enterprises with annual sales volume over 20 million RMB and retail enterprises with annual sales volume over five million RMB.

supermarkets and countryside stores in "thousands of villages" project in rural areas to 70 % and 60 % respectively, and to improve the distribution rate of agricultural material chain enterprises to over 80 % by 2015.

9.3.1.2 Low Level of Specialized Logistics Service

At present, the service level of logistics enterprises in China can hardly meet the logistics requirements of chain businesses for frequent, prompt and punctual delivery; especially in some professional fields, the development level of chain business logistics needs to be elevated urgently. For example, with respect to cold-chain logistics of fresh food, China is still short of cold-chain equipment and facility and behind in technology. According to statistics, the per capita cold storage capacity in China is only 7 kg; refrigerated truck accounts for only 0.3 % of all freight vehicles, comparing to 1 %, 2.6 % and 3 % in the US, the UK and Germany respectively. The existing refrigeration facilities in China are generally outdated, and almost half of the nation's refrigerated store houses have been in use for over 30 years. There are few enterprises that can provide coordinated cold-chain logistics services of fresh food warehousing, transportation and distribution, which constrains further development of chain business logistics in China.

9.3.1.3 Policy Environment Needs to Be Improved

Though China's Ministries and Commissions have successively issued a series of policies to support the development of chain business logistics in recent years, yet the policy environment of chain business logistics still needs to be improved. For example, diminution of land for urban logistics and shortage of logistics infrastructure had led to rising rent for warehouses and storage yards around large and medium-sized cities, thus increasing the logistics cost for chain businesses. This mandates the government to strengthen the planning of land usage in order to meet the logistics distribution centers' need on land for warehousing facilities. As another example, urban traffic control ordinances (such as setting restricted vehicle-access areas in urban district, forbidding thoroughfare of vehicles at certain times or for daytime) leads to difficulty in driving or parking for delivery vehicles at "the last mile," which debilitates the development of chain logistics distribution.

9.3.2 Development Trend

9.3.2.1 Functions of Chain Logistics in Key Fields Will Be Strengthened

Construction of logistics in the field of business distribution in China will be continually accelerated. Development will be made for specialized logistics systems involving agricultural product logistics, food cold-chain logistics and

medicine; the function of chain logistics also will also be strengthened; distribution network for inter-regional transportation will be improved and construction of cold-chain logistics will be a priority in the development of chain logistics. The *Project Planning for Business Logistics Development* issued in March 2011 clearly points out to raise the proportions of cold-chain transportation rate for fruit and vegetable, meat, and aquatic product to 20 %, 30 % and 36 %, respectively, by 2015. As for medicine chain distribution, the reorganization, optimization and integration of medicine circulation enterprises have become an inevitable trend, so that the functions and efficiency of medicine logistics will be strengthened.

9.3.2.2 Socialized Logistics Services Will Be Utilized More Widely

The service capacity of third-party logistics enterprises in China will be further improved. These enterprises will not be limited to offering simple distribution and storage services, instead, they will develop deeper cooperation with chain merchandising enterprises in areas of value-added services such as inventory management, circulation processing, logistics information service, and logistics cost control. Socialized logistics service will provide a higher-level service support for chain business.

Furthermore, in the fields of household electrical appliances, apparels, cosmetics and health care products, some large producer enterprises begin to use their massive capability in logistics distribution to set up dedicated third-party logistics enterprises and extend it to socialized logistics distribution. These third-party logistics enterprises are gradually meeting the requirements of the chain enterprises and getting involved in providing logistics services to the latter. This segment of the socialized logistics service also will play a significant role in the field of chain business logistics.

9.3.2.3 Further Development Will Be Made in Supply Chain Collaboration

Member enterprises of the supply chain will improve the logistics efficiency of the channel through cooperation, thus attaining a wider profit margin. Beijing Capital Agribusiness Group (CAG) and Wumart Group established a strategic partnership to jointly build the Eastern Suburb Wu-mart New Logistics Distribution Center; in August 2009, the Center began operation under contract. On June 30, 2010, Gome Electrical Appliance and Haier Group signed the largest cooperation project in domestic household electrical appliance industry, thus promoting both parties to develop a deeper strategic cooperation in the third-tier and fourth-tier markets across the country. All these events signify that there will be a more evident tendency of deeper cooperation between the upstream and downstream parties of the chain business supply chain and a coordinated development of logistics in China.

9.4 Summary

This chapter gives an overall description of the development of chain business logistics in China. The first section introduces the policy and market environment of chain business logistics in China, providing the background for a better understanding of the development environment of chain business logistics in China. The second section analyzes the current development of chain business logistics in China from the standpoint of the scale of demand for chain logistics, the construction of logistics distribution center, the integration of circulation channel, the cooperation with the third-party logistics enterprises, automation and informatization, and the supply chain collaboration. The third section expounds on the existing problems and the direction of future development based on the current status of chain business logistics in China.

Chapter 10
Development of Medicine Logistics in China

Lanbing Li

Recently medicine logistics has made apparent progress in China. Yet admittedly there still exist some major problems such as out-dated infrastructures and weak enterprise competitiveness. At present, the development of medicine logistics still has not adapted to the new requirements of the medical system reform and the market evolution. Thus, acceleration of medicine logistics development is of great significance to regulating the order of medicine production and circulation, achieving the scientific development of the medicine production and circulation industry, and ensuring the safety, reasonableness and convenience of medicines for the general populace.

This chapter comprises three parts. The first part introduces the characteristics, the operations subjects, the operations procedures, the operations network and the service modes of China's medicine logistics. The second part explains the current development status of China's medicine logistics, and the third part analyzes the problems and strategies of medicine logistics development in China.

10.1 Overview of Medicine Logistics

Modern medicine logistics aims to plan, regulate and control medicines and the relevant information through applying advanced management concepts and relying on modern information technology and facilities, so as to realize the effective flow of medicines and the relevant information from suppliers to demanders. Narrowly speaking, medicine logistics is the whole process which begins with medicine production and ends with it reaching he consumers through medicine circulation. Generalized medicine logistics extends the process to include medicine raw material suppliers, so it comprises the linkages of raw material supply, production, circulation,

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and final consumers. The scope of discussion for this chapter is confined to the narrowly-defined medicine logistics.

10.1.1 Main Characteristics, Operations Subjects and Operations Procedures of China's Medicine Logistics

10.1.1.1 Main Characteristics of Medicine Logistics

First of all, safety is of foremost importance. Ensuring medicine safety is the primary requisite for medicine logistics as a critical support system throughout medicine production and circulation. Secondly, the effective operations of medicine logistics necessitate higher requirements on technologies, talents and facilities. For instance, medicine logistics enterprises hold stringent standards in choosing pharmacological professionals such as licensed pharmacists; To comply with the low-temperature operating environment, medicine logistics enterprises must invest in cold chain logistics facilities. Furthermore, the medicine logistics industry has a strict market access and regulation system. For example, China's medicine production and operation enterprises must pass the GMP and GSP certifications respectively.

10.1.1.2 Operations Subjects of Medicine Logistics

The medicine production and circulation process from production to end-users covers five circulation subjects, namely, pharmaceutical factories, agents, distributors, hospitals and pharmacies, and patients. The operations subjects of medicine logistics mainly comprises the first four categories—pharmaceutical factories, agents, hospitals and pharmacies; the final link from hospitals or pharmacies to the patients in medicine circulations is ordinarily completed by the patients through fetching medicines themselves.

10.1.1.3 Medicine Logistics Operations

Medicine production logistics occurs in a pharmaceutical factory and refers to logistics activities during the medicine production process. It starts from raw materials input and ends in the finished products warehouse. The main procedure of medicine production logistics includes the acquisition of raw materials and packageing substance, warehousing and storage management, raw materials withdrawal and mixing, finished products packing, warehousing and storage, order-picking and outbound shipping of finished products.

Medicine sales logistics refers to the effective flow of medicines and the relevant information between suppliers and demanders, and the resultant processes of planning, regulating and control for accomplishing this flow. The key links of medicine sales

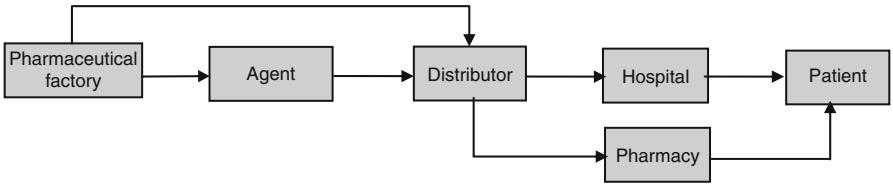

Fig. 10.1 Basic logistics process of domestic medicines through agents or distributors

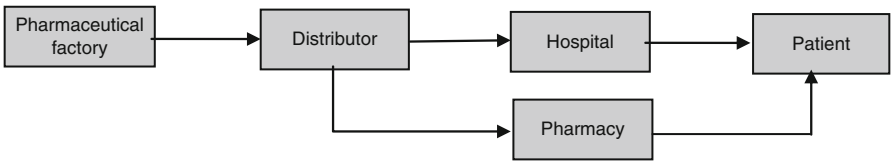

Fig. 10.2 Basic logistics process of domestic medicines through factory promotion

logistics include medicine ordering and information processing, medicine packing, storage, transportation, delivery, loading, unloading, and handling.

Hospital medicine logistics occurs in a hospital and refers to the logistics management aiming to guarantee the effective circulation of purchased medicines and on-site preparations; it mainly comprises medicine purchase, storage, loading, unloading, and handling.

10.1.2 Operations Network of China's Medicine Logistics

Based on the different producing countries, medicines can be classified into domestic medicines, joint-ventured medicines and imported medicines. Wherein, the domestic medicines can be classified by the sales channel as sold through individual agents and sold directly through manufacturers.

There are two forms of domestic medicines circulation through individual agents. One way is for pharmaceutical manufacturers to directly authorize and send the medicines to the distributors, and then from the distributors to hospitals or pharmacies. Another way is for medicines to flow from manufacturers to agents, dispatched by agents to distributors with corresponding qualifications, then delivered by distributors to hospitals or pharmacies, and finally sold to patients or purchasers. Medicine logistics under this mode mainly include the following types: (1) Production logistics in a pharmaceutical factory; (2) Hospital logistics; (3) Medicine sales logistics for the orderly circulation among factories, agents, distributors, hospitals and pharmacies, as shown in Fig. 10.1.

The circulation subjects of domestic medicines via the form of direct marketing by manufacturers and jointly-ventured producers are basically the same, which include pharmaceutical manufacturers, distributors, hospitals and patients. The agents' role is assumed by the pharmaceutical companies or their subsidiaries, as shown in Fig. 10.2. Medicine logistics of this form contains the following types: (1) Production

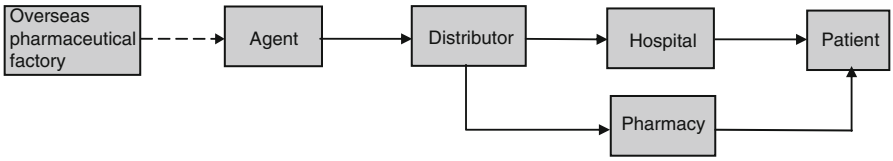

Fig. 10.3 Basic logistics process of imported medicines

logistics in a pharmaceutical factory; (2) Hospital logistics; (3) Medicine sales logistics for the orderly circulation among factories, distributors, hospitals and pharmacies.

The circulation subjects of the imported medicines include agents, distributors, hospitals and pharmacies; production logistics of overseas pharmaceutical factories is excluded due to foreign ownership. The logistics process is composed of international logistics and domestic logistics, with agents as the main executor of international logistics. The medicine distribution process from agents to distributors, and then to hospitals or pharmacies takes the form of domestic logistics, as shown in Fig. 10.3.

10.1.3 Service Modes of China's Medicine Logistics

There are two distinct service modes in China's medicine logistics: self-operated mode and outsourced mode. The self-operated mode of medicine logistics means that medicine enterprises and medical institutions carry out the logistics process on their own. This mode has the merits of stronger control over the logistics linkages, the sole right to choose distribution channels, and lesser chance of leakage of commercial secrets. However, it also has the drawbacks of consuming large amount of capital and diversion from the key enterprise's business focus. Production logistics of pharmaceutical manufacturers and medicine logistics of large medicine commercial enterprises and hospitals still engage in this type of self-operated mode.

Outsourced logistics mode means that medicine manufacturers, medicine commercial enterprises, and medical institutions outsource their logistics activities and entrust the third-party logistics enterprises to provide them with professional logistics services. For example, the Ministry of Commerce chose the Jointown Group Co., Ltd., the Sinopharm Group Co., Ltd. and the Beijing Pharmaceutical Co., Ltd. as the subjects of extended demonstration project of outsourced medicine logistics, to encourage modern medicine logistics enterprises to participate in the outsourcing of hospitals' pharmacy service and provide a collaborative platform of customerized supply chain management for hospitals and pharmacies.

With the deepening reform of China's medical system, the development of specialized logistics mode has become a crucial avenue to regulate the order in medicine production and circulation. However, since third-party medicine logistics enterprises in China are still at the initial development stage, demand for medicine logistics service from medicine manufacturers, medical service institutions and

medicine commercial enterprises are gradually being met by outsourcing. Hence, the logistics service mode of mixing self-operated logistics and outsourced logistics has become the popular choice for many medicine logistics demand subjects.

The logistics service mode of combining self-operated and outsourced services mainly exists in some large and powerful medicine commercial enterprises in China. On the premise of accomplishing the medicine logistics services on their own, these enterprises can provide pharmaceutical factories, pharmacies, hospitals and other small medicine commercial enterprises with the third-party logistics service through the third party's extensive regional medicine logistics centers, strong logistics transportation networks, efficient logistics service and management systems and advanced logistics technology platforms.

10.2 Current Development of China's Medicine Logistics

Nowadays, the development of China's medicine logistics is manifested in the following ways: the emerging third-party medicine logistics enterprises have taken a preliminary step in development; large-scale medicine commercial enterprises are actively expanding their third-party logistics capabilities; specialized medicine logistics services have begun to extend to hospitals; the capability of medicine cold-chain logistics service has also been enhanced. At the same time, local governments and enterprises are vigorously developing medicine logistics centers, medicine distribution centers and medicine logistics parks. On the whole, China's medicine logistics market holds a promising and wide-open prospect and has plenty of room for further development.

10.2.1 Emergence of Third-Party Medicine Logistics Enterprises

It is clearly mandated in the *Outline for Development Program of National Pharmaceutical Circulation Industry (2011–2015)* to promote the development of professional medicine logistics service. On the premise of meeting medicine logistics standards, it is essential to develop third-party medicine logistics through effective utilization of external logistics resources such as postal services and other storage facilities. Meanwhile, multiple factors such as increasingly fierce competition in medicine markets, changes in medicine marketing approach and elevation of the level of logistics demand in pharmaceutical industry jointly propel the initial development of two types of third-party medicine logistics enterprises in China.

Type I refers to the third-party logistics enterprises which specialize in medicine logistics services. For example, Hangzhou Bangda Logistics Co., Ltd. gained access into the third-party medicine logistics field in 2001, and has been providing medicine manufacturers and commercial enterprises with medicine logistics distribution

services. Pharmaceutical companies such as Conba, Sanofi, and Intermedichave outsourced their medicine logistics to Bangda Logistics.

Type II includes comprehensive third-party logistics enterprises or third-party logistics enterprises specialized in other industries which sprawl their business to the medicine logistics field. For example, in 2009, DHL established the Life Science & Healthcare Logistics Center in Shanghai to provide its clients—domestic and foreign medicine companies, biochemical laboratories and medicine manufacturers with one-stop logistics supply chain solutions.[1]

10.2.2 Functional Expansion of Large Medicine Commercial Enterprises

The issuance of the *Opinions of the CPC Central Committee and the State Council on Deepening the Healthcare System Reform* in April 2009 signified the launching of a new health system reform in China. With the continuous deepening and promotion of China's medical system reform, large medicine enterprises began to actively transition from the traditional revenue-generating mode through medicine underwriting and distribution to the operational mode of "third-party logistics."

Sinopharm Pharmaceutical Logistics Co., Ltd. operates in three regions in East China, North China and South China. It has built regional logistics centers and distribution center systems in Shanghai, Beijing, Guangzhou, Tianjin, and Shenyang to offer professional medicine storage, delivery, distribution processing, information service and other customized services. Currently, the company has provided many domestic and foreign manufacturers, medicine circulation enterprises and retail chain enterprises such as Bayer Healthcare Co., Ltd. and GlaxoSmithKline Pharmaceutical (China) Co., Ltd. with storage and distribution services.

Shanghai Pharmaceutical Holding Co., Ltd. established a logistics center in Suzhou City in December, 2009 to serve as its main base of third-party logistics to undertake modern storage and logistics function thereof. On one hand, it can embark on a new business mode via the third-party logistics to complement its primary business mode of direct sales to hospitals, medicine wholesale and terminal distribution. On the other hand, it can effectively connect the upstream enterprises and downstream users, reduce medicine distribution costs for the upstream manufacturers and medicine circulation enterprises.

Moreover, leading commercial medicine enterprises like Jointown Pharmaceutical Group, Sinopharm Group Co., Ltd. and Nanjing Pharmaceutical Co., Ltd. not only established their own modern medicine logistics centers but also successively acquired some third-party logistics enterprises to make advance in this arena.

[1] "Logistics giants in China's supply chain segments-the first Life Science and Medical Care Logistics Center of DHL was established in Shanghai", Beijing Business Today, 2009-06-19.

10.2.3 Extending Professional Medicine Logistics Service Functions to Hospitals

In June 2011, the Ministry of Commerce initiated the demonstration project of "medicine logistics extension" to promote the model of medicine distribution enterprises extending the modern medicine logistics services to hospitals. Jointown Pharmaceutical Group, Sinopharm Group Co., Ltd and Beijing Pharmaceutical Co., Ltd. were chosen by the Ministry of Commerce as the pilot enterprises of the demonstration project for medicine logistics extension.

Jointown Pharmaceutical Group established three medicine logistics extension service models including "unified distribution within hospital", "intelligent medicine storage transformation" and "extension of central medicine storage." The model of unified distribution within hospital implies that Jointown is responsible for receiving medical materials and settling up account with the original suppliers, and furnishing medicines in a centralized manner as supplier and distributor. Intelligent medicine storage transformation focuses on the intelligentization of hospitals pharmacies, the automation of central medicine storage and the electronization of external interaction, so as to transition from manpower to intelligence-based operation. The extension of central medicine storage mainly provides receiving service and storage service on medicine delivery, within-hospital distribution service, and software service.[2]

Beijing Pharmaceutical Co., Ltd. has established the "Tiantan model" which focuses on specialization and informatization. This model aims to extend the modern medicine logistics information system, automation technologies and management service into the hospital medicine storeroom, pharmacies and patient wards. It provides help to set up the hospital medicine storeroom logistics management system meeting GSP management requirements, and improve the informatization level and distribution efficiency of medicine management.[3]

10.2.4 Improved Medicine Cold-Chain Logistics Service

Medicines such as vaccines and biological agents pose stringent requirements on ambient temperature during storage and transportation. Handled improperly, they will deteriorate due to physical, chemical and other reactions. Thus, cold-chain logistics plays a critical role in ensuring medicine quality. In recent years, the medicine cold-chain logistics capability in China has been improved.

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[2] "Jointown logistics extension service enters into hospitals to considerably improve the efficiency". http://news.hexun.com/2011-09-05/133106147.html.

[3] Xu Jiaping, "Various Extension Service Models for Medicine Logistics Innovated by Beijing Pharmaceutical Co., Ltd.", Pharmaceutical Economic News, 2011.

Beijing Pharmaceutical Co., Ltd. designed and established the first constant temperature and humidity refrigerator in the nation's pharmaceutical circulation industry at the beginning of 2010. With the construction of the new refrigerator, the company had achieved the design qualification, installation qualification, operational qualification and performance qualification (4Q for short). To carry out the monitoring on cold-chain medicines during the warehousing and distribution processes, it imported a new RFID system in September 2010 and launched it in December 2010 to commence data collection and recording and full-range cold-chain management. In January 2011, the Promotion Center for Internet of Things of the Ministry of Industry and Information Technology of the People's Republic of China formally commended the cold-chain logistics project of Beijing Pharmaceutical Co., Ltd. with the Award of Excellence in "China's RFID Demonstration Project for Cold-chain Internet of Things."

Sinopharm Group Co., Ltd. also actively develops cold-chain logistics to provide services such as cold-chain packing, storage and transportation as well as vaccine services, thus ensuring that the medicines quality will not be impaired by improper temperature. Real-time monitoring of temperature and humidity is realized for the entire process of medicine distribution, so as to resolve the major problem concerning medicine safety on delivery and in storage in China.

10.2.5 Rapidly-Developed Medicine Logistics Center

The rapid pace of planning and construction of medicine logistics centers in China lays a firm foundation for its medicine logistics development. From the view of regional placement, medicine logistics centers are mostly concentrated in the Eastern Region, then in the Central and Western Regions with few in the Northeast Region. Medicine logistics centers have transformed from traditional logistics suppliers to medicine supply-chain managers, the latter integrates the role of information center, trade center, storage center and distribution center into one. Some of the medicine logistics centers possess excellent equipment and facilities, and employ advanced information management system and modern logistics technologies.

Shanghai Logistics Center of Sinopharm Group Co., Ltd. is a large multifunctional logistics enterprise integrating the capability of storage, custody, transshipping, packing and distribution. Its warehouses consist of three-dimensional warehouses, plane warehouses, cold-storage warehouses and special medicine warehouses; it operates with modern equipment such as RFID tags, auto stackers, conveyors and sorting machines. Equipped with advanced information technology support, it is deemed as a successful example which first applied the information technology in domestic medicine industry. Within this system, procedures like medicine acceptance, storage, receiving and distribution review are implemented in strict accordance with SFDA management regulations; GSP certification for the third-party

medicine logistics is acquired to ensure that medicines are transferred from production site to consumption site safely and efficiently.[4]

Beijing Modern Medicine Logistics Center was established and put into use by Jointown Pharmaceutical Group in 2008. The center has an overall building area of 32,000 m^2 with 400,000 cases of storage capacity, 15,000 cases of average daily throughput and 25,000 cases of peak throughput volumes. Marketing network of the center covers Beijing and surrounding areas; order fulfillment time is controlled under 24 h; error rate for medicine delivery is controlled at below 0.03 %. The establishment and operation of this new modern logistics center will facilitate the intensification of medicine circulation industry.[5]

Yabang Pharmaceutical Logistics Center is comprised of two parts: medicine marketing center and logistics center. The medicine marketing center in Changzhou and the pharmaceutical outlets set in 13 prefecture-level cities in Jiangsu Province form an intensive medicine sales and distribution network for Yabang in the province. Meanwhile, its logistics center has established a logistics platform and a comprehensive logistics trading network to collect logistics service resources and customer resources. Through these operations the medicine marketing center and the logistics center of Yabang are able to realize the advantage of complementation, resource sharing and joint development.[6]

10.3 Problems in China's Medicine Logistics Development and Countermeasures

Although China's medicine logistics development has made noticeable progress in recent years, further improvement is still much needed on the strength of medicine logistics enterprises, cold-chain logistics, logistics standardization, information-based logistics and logistics infrastructures. This section will summarize the shortcomings and propose some countermeasures for the improvement and promotion of China's medicine logistics.

10.3.1 Problems in Medicine Logistics Development

10.3.1.1 Weakness in Medicine Logistics Enterprises

First, the majority of medicine logistics enterprises are small in size, thus unable to realize the scale effect. Secondly, logistics services of most logistics enterprises are of repetitive and mundane type of storage and distribution functions. Only a low

[4] Sinopharm Group Co., Ltd. http://www.sinopharmlog.com/cn/index/index.asp.

[5] Lu Yue, "Jointown Established the First Automatic Pharmaceutical Logistics Center in China", China Pharmaceutical News, December 8, 2008.

[6] "Jiangsu Yabang Pharmaceutical Logistics Center is Put into Operation," http://www.clb.org.cn/yywl/01/41672.shtml.

percentage is of high value-added services such as cold-chain services, vaccine services, distribution processing and multi-warehouse operation. Thirdly, some enterprises operate at a low technical level, with poor management capability and limited services; logistics conditions provided by some medicine logistics enterprises fail to meet the quality requirements on medicine circulation, thus adversely affecting the medicine safety.

10.3.1.2 Imperfect Medicine Cold-Chain Logistics System

In China, there is no unified standard of technology specifications and service quality for medicine cold-chain logistics; management methods and monitoring means for medicine cold-chain logistics are relatively lagging. Thus, it is difficult to ensure proper temperature during low-temperature transportation and storage of medicines. Breakdown of cold chains occurs often and causing damage to the quality of medicines.

10.3.1.3 Informatization and Traceability of Medicine Logistics Need Improvement

First, logistics information management systems such as electronic order subscription (EOS), global positioning system and geographic information system (GPS/GIS), radio frequency identification (RFID), warehouse management system (WMS) and logistics technologies have yet been effectively popularized and applied. Secondly, information management systems of many pharmaceutical enterprises are only confined to internal operations and fail to establish network connection and information sharing with their upstream and downstream enterprises. So the logistics activities among enterprises are not well linked up to achieve the capability of modern logistics management. Finally, China's medicine logistics still needs to improve its overall traceability by building upon advanced technology.

10.3.1.4 Realignment of Medicine Logistics Infrastructures

First, the construction of medicine logistics infrastructure differs markedly among different regions; their spatial placement should be realigned. From an overall perspective, infrastructures of medicine distribution centers and distribution parks in the Eastern coastal areas and other developed areas are relatively complete, while those in the Central and Western Regions are relatively backward. Secondly, conspicuous gap exists in medicine logistics infrastructures between urban and rural areas. The majority of medicine logistics infrastructures are concentrated in cities, while medicine logistics networks and distribution nodes are lacking in rural areas. Furthermore, although medicine logistics facilities are continuously being constructed, the level of medicine infrastructures is still low in many enterprises and regions.

10.3.2 Measures for Accelerating the Development of China's Medicine Logistics

Governments and enterprises need to cooperate and endeavor to improve China's medicine logistics. Specific measures and suggestions are as follows:

10.3.2.1 Promote the Application of Modern Logistics and Supply-Chain Management Technologies in Medicine Production and Circulation Field

(a) Further popularize modern logistics and supply-chain management practices, and encourage medicine production and circulation enterprises to outsource logistics in accordance with the principle of division of work by specialization and collaboration. (b) Encourage logistics enterprises to expand service functions and focus on developing high-end logistics services such as inventory management, information management, and system design; and to realize integrated operations encompassing procurement, production, sales and recycling in the pharmaceutical manufacturing industry, through alliance and outsourcing. (c) Encourage logistics enterprises to focus on developing joint distribution, refrigerated storage, information management and other high-end logistics services in the medicine circulation field, so as to improve their response to markets, reduce inventories, and accelerate turnover through alliance and outsourcing.

10.3.2.2 Encourage Joint Development of Diversified Modern Medicine Logistics Modes

(a) Encourage those medicine circulation enterprises with requisite modern logistics technology and service capacities to conduct assets restructuring through various ways such as share participation, share holding, merger, joint venture and cooperation, so as to cultivate larger medicine logistics enterprises; encourage them to provide logistics services for medicine production and circulation enterprises, various levels of medical institutions and medicine commercial outlets. (b) Hasten the development of specialized third-party medicine logistics enterprises; encourage them to provide integrated logistics services including procurement, production, sales and recycling to medicine production enterprises; develop value-added logistics services including information management, inventory management and joint distribution to medicine wholesalers, retailers, chain pharmacies and hospitals.

10.3.2.3 Accelerate the Construction of Medicine Infrastructures

(a) Conduct overall planning and placement for a host of public logistics and distribution centers for medicine (medicine materials) production in the key cities on the logistics network nodes, medicine manufacturing bases and production bases of traditional

Chinese medicine materials; focus on developing a set of temperature-controlled medicine cold-chain logistics and distribution centers; encourage local governments to guide diversified capitals, by means of land use, tax revenue, subsidized loans, financial subsidies, to be invested in the construction and operation of medicine logistics and distribution centers. (b) Perform overall planning for the construction of medicine logistics infrastructures and improve the integration of medicine logistics network in urban and rural areas; vigorously develop public distribution centers and joint distribution systems in rural areas, and encourage large medicine logistics enterprises to expand rural medicine logistics service networks.

10.3.2.4 Accelerate the Upgrading of Technology and Equipment for Medicine Logistics

(a) Encourage the medicine production and circulation enterprises to improve the depth and breadth of advanced information technology application; promote the standardization of facilities and equipment such as logistics coding, and pallet specifications. (b) Accelerate the introduction, absorption and original R&D of modern logistics technologies, and improve the capacity of self-reliant innovation and technologies in medicine logistics industry. (c) Further improve the safeguards of logistics technology on medical toxic drugs, narcotics, psychoactive drugs, radioactive medicines and biological products to ensure medicine safety.

10.3.2.5 Establish Standardized Full-Process Medicine Cold-Chain Logistics Service System

(a) Amend and perfect the *Technology and Administrative Measures for Medicine Cold-chain Logistics*. (b) Encourage medicine production, circulation and logistics enterprises and other business entities to strengthen the construction of cold-chain facilities and equipment; encourage them to accelerate the construction of a batch of technologically advanced, environmentally sound, efficient and suitable cold storehouses, based on technology transformation and full use of existing low-temperature storage facilities; encourage logistics enterprises to purchase refrigerated transport vehicles so as to raise the ratio of cold-chain transportation; encourage logistics enterprises to plan and construct low-temperature distribution centers around large or medium-sized cities. (c) Focus on developing a group of logistics enterprises with cold-chain service capabilities and good development potential; encourage logistics enterprises to make use of advanced information technologies to realize real-time temperature monitoring, geographical location tracking and in-transit information query; establish an easy, efficient and full-process medicine cold-chain information tracking system.

10.4 Summary

This chapter depicts the current development and problems of China's medicine logistics, and puts forward corresponding solutions thereof. Regarding current development in China, the third-party medicine logistics enterprises are gradually emerging, large medicine commercial enterprises are continually expanding their functions of third-party medicine logistics, and hospitals are moving toward providing specialized medicine logistics services. The capacity of medicine cold-chain services is improving, and the planning and construction of medicine logistics centers have been accelerated.

Nevertheless, there is still ample room for improvement in the capabilities of the logistics enterprises, cold-chain logistics, informatization and traceability of medicine logistics, and more equitable infrastructure construction. To further strengthen the development of China's medicine logistics, governments and enterprises should work together to actively promote the application of modern logistics and supply-chain management technologies in the medicine production and circulation fields, encourage the collaborative development of diversified modern medicine logistics service modes, accelerate the construction of medicine logistics infrastructures, and upgrade the medicine logistics technologies and equipment.

Chapter 11
China's Logistics Cost: Status and Analysis

Ling Wang

In the past decade, China's logistics has maintained a momentum of fairly rapid growth, thus providing significant support for sound development of national economy and adjustment of industrial structure. However, logistics cost in China has remained at a comparatively high level. Especially in recent years, logistics cost has risen rather rapidly, yet operations efficiency of logistics remained far below that of the developed countries. These factors not only constrain the development of the logistics industry and reduce the competitiveness of production enterprises, but also cause the price hike of basic production and livelihood materials. So the Government, the enterprises and even the general public are concerned with the issue of how to deal with the problem of high logistics cost.

This chapter presents an analysis on the status of China's logistics cost, the primary causes of rising cost, and policies and measures implemented by the Government to reduce such a cost. The first section analyzes the costs and structures of logistics, including that for social logistics, industrial and commercial enterprise's logistics, logistics enterprise's primary business, and highway transport. The second section gives an analysis on the cause of China's rising logistics cost in five respects, including fuel cost, labor cost, land price, road tolls and business tax. The third section introduces the policies and measures released by the Government for reducing logistics cost.

11.1 Status of China's Logistics Cost and Its Structure

Logistics cost refers to the expenses for materialized labor and living labor incurred during the logistics activities of enterprises. It includes the sum total of human recourses, material recourses and financial recourses consumed during the process

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of transport, storage, packaging, loading and handling, distribution processing, logistics information, logistics management, as well as inventory-related capital cost, inventory risk cost and inventory insurance cost. China's logistics cost as a whole exhibits a momentum of rapid growth. A big gap exists between China and developed countries in terms of either the social logistics cost as a percent of GDP or the logistics expense to sales.[1] Therefore, high logistics cost, unreasonable cost structure, and low logistics efficiency are problems which need to be resolved as urgently as possible.

11.1.1 Cost and Structure of Social Logistics in China

Social logistics cost refers to various expenditures for social logistics activities in the national economy in all aspects within a certain reporting period, and is classified into three categories, namely, transportation cost, Logistics administration cost and carrying cost. The first category involves all expenses paid due to goods transport in the national economy, the second category involves expenses incurred by the organization and management of various logistics activities by the administrative units of goods suppliers and demanders, and the third category includes all expenses of social logistics activities incurred during the delivery of goods from the initial resource supplier to the final consumer, other than the transportation and logistics administration costs, such as interest expense, warehousing expense, insurance expense, etc.

11.1.1.1 Social Logistics Cost

Over the past decades, China's social logistics cost has seen a trend of accelerated growth (as shown in Fig. 11.1). From 1991 to 2011, social logistics cost witnessed an average annual growth of 15.2 %. The growth rate was high in the "8th Five-Year Plan" [2] period due to the low base value. The average annual growth rate was 8.5 % and 12.0 % in the "9th Five-Year Plan" period and the "10th Five-Year Plan" period respectively; it reached 16.1 % in the "11th Five-Year Plan" period, which is approximately twice that in the "9th Five-Year Plan" period. The rapid growth of logistics cost is shown by the accelerated growth of transportation cost, carrying cost and logistics administration cost.

[1] Logistic expense ratio refers to the percentage of logistic expense in sales and is an index showing logistics efficiency.

[2] "The "Five-Year Plan" is part of China's national economic plan, in which the planning is mainly made for major construction projects, regional productivity directivities, essential ratios of the national economy. The purpose of the plan is to set the objectives and directions for future development of the national economy. The eighth five-year plan period was from 1991 to 1995 and called the "8th Five-Year Plan" for short; the ninth, tenth and eleventh "five-year plan" period cover 1996–2000, 2001–2005, and 2006–2010, and are named the "9th Five-Year Plan" the "10th Five-Year Plan", and the "11th Five-Year Plan" for short, respectively.

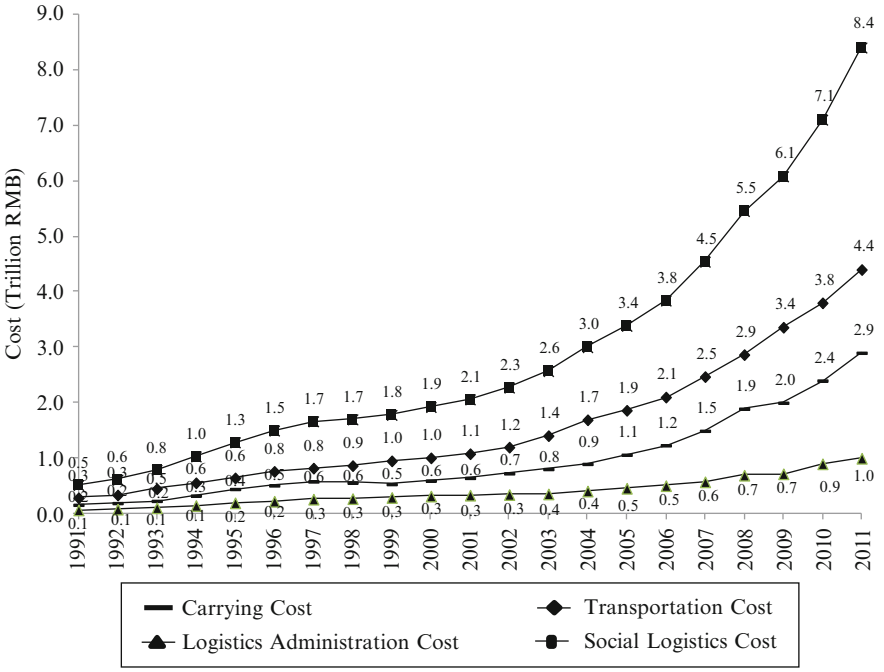

Fig. 11.1 Tendency of change in Cost of China's social logistics (Source: Data for 1991–2006 are drawn from the *China Logistics Yearbook of 2007*; data for 2007–2011 are drawn from the *Report on China's Logistics Operations* of each year, jointly issued by the National Development and Reform Commission, the National Bureau of Statistics and the China Federation of Logistics and Purchasing)

11.1.1.2 Structure of Social Logistics Cost

Transportation cost accounts for the highest proportion in China's social logistics cost. From 1991 to 2011, transportation cost was the main component of social logistics cost with the proportions oscillating between 50 % and 57 %, followed by carrying cost with the proportions kept between 30 % and 35 %, and finally the Logistics administration cost with the proportions maintained between 12 % and 17 %. The structure of China's social logistics cost is shown in Fig. 11.2.

The structures of social logistics costs of the United States and Japan, shown in Figs. 11.3 and 11.4, are taken as a representative of developed countries for assessing the structure of China's social logistics cost. By comparison the structure of China's social logistics cost is notably unreasonable in the following aspect. Logistics administration costs of both developed countries account for a fairly low proportion—below 4 % for the US and below 5 % for Japan; they are lower than the proportion of China's Logistics administration cost by 8–9 % points.

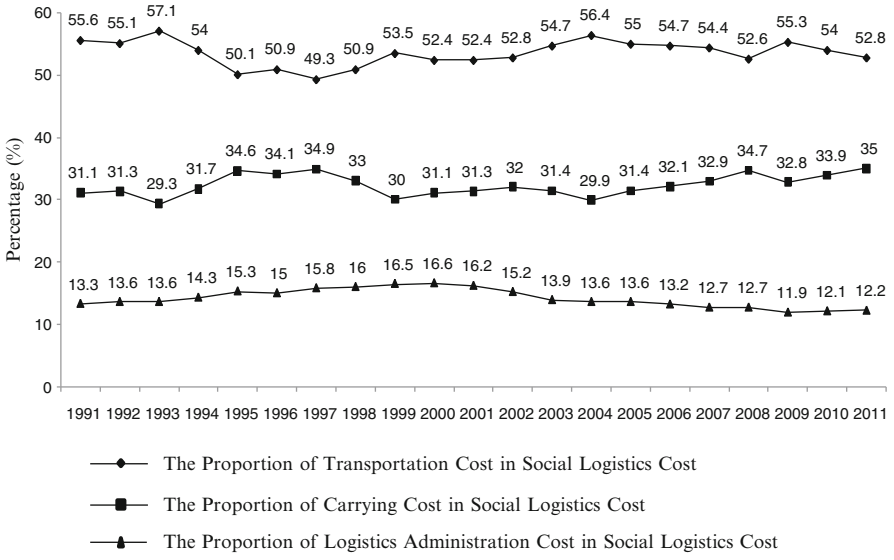

Fig. 11.2 Structure of the China's social logistics cost for 1991–2011 (Source: Data for 1991–2006 are drawn from *China Logistics Yearbook of 2007*; data for 2007–2011 are drawn from the Report on China's Logistics Operations of each year, jointly issued by the National Development and Reform Commission, the National Bureau of Statistics and the China Federation of Logistics and Purchasing)

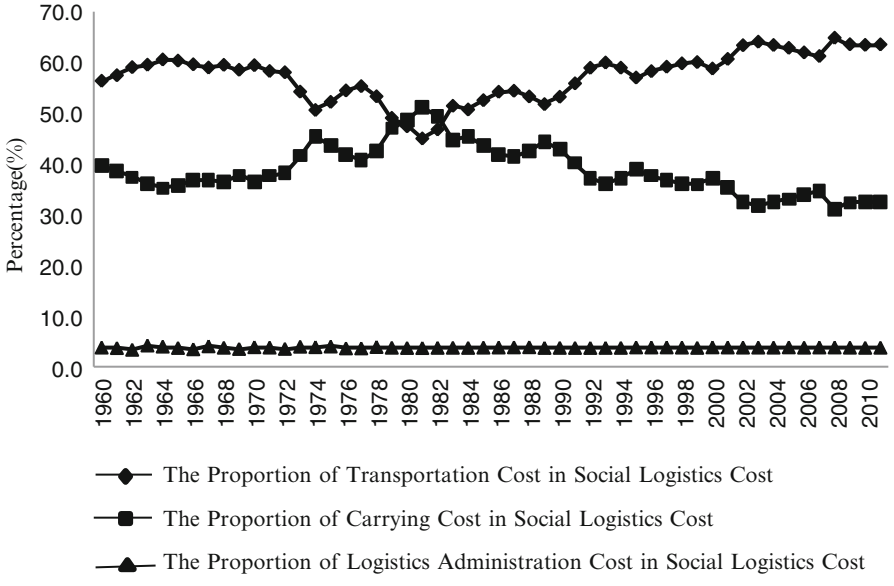

Fig. 11.3 Structure of social logistics cost of United States for 1960–2011 (Source: Data drawn from *the 12th–23th Annual State of Logistics Report*, http://cscmp.org/memberonly/state.asp)

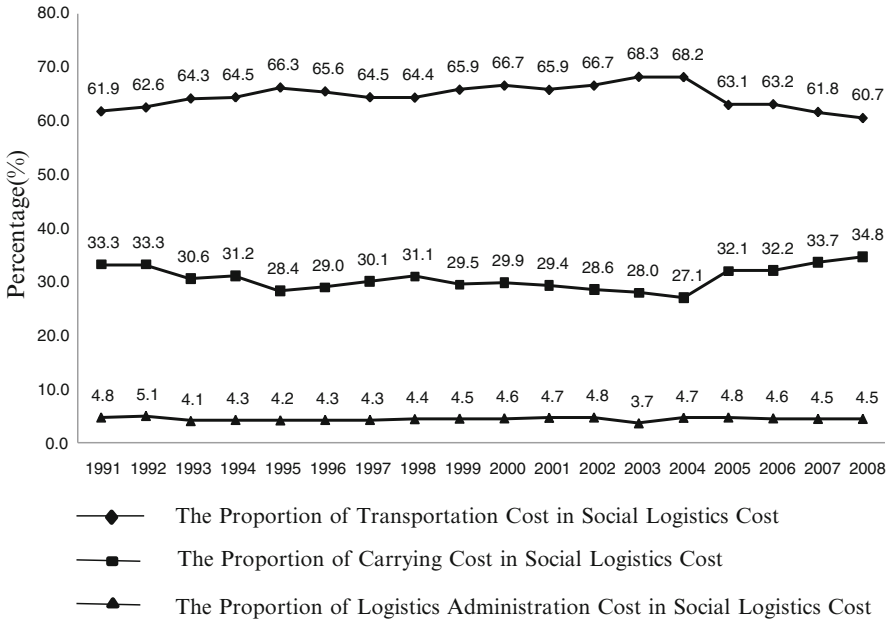

Fig. 11.4 Structure of social logistics cost of Japan for 1991–2008 (Source: Data drawn from the *Logistics Cost Report (2010)*, Japan Institute of Logistics System, March, 2011)

11.1.1.3 Social Logistics Cost as a Percent of GDP

China's social logistics cost as a percent of GDP shows a trend of gradual decline, as shown in Fig. 11.5. This percentage dropped to 17.8 % in 2011 from 24.0 % in 1991, declined by 6.2 % points in total. Therein, the transportation cost as a percent of GDP declined by 3.9 % points, that of carrying cost in GDP by 1.3 % points and that of Logistics administration cost in GDP by 1.0 percentage point.

Even though China's social logistics cost as a percent of GDP keeps declining, yet it is still high as compared with that of the developed countries. Since 1960s, the social logistics cost as a percent of GDP for the US has generally followed a declining trend, except for a spike of 16.2 % in 1981. In recent decades, this percentage has remained between 8 % and 10 %. The social logistics cost as a percent of GDP of the US are shown in Fig. 11.6.

The social logistics cost as a percent of GDP for Japan also declined continually on the whole as shown in Fig. 11.7. From 1992 to 2008, the social logistics cost as a percent of GDP were all below 10 % and has basically stabilized below 9 % in the past decade.

At present, China's social logistics cost as a percent of GDP is basically twice that of the US and Japan. Therein, the transportation cost, carrying cost and Logistics administration cost as a percent of GDP are respectively about 1.8 times, 2 times and 5–6 times those of the US and Japan. It is thus clear that China still has ample room to further reduce its logistics cost and improve its logistics operations efficiency.

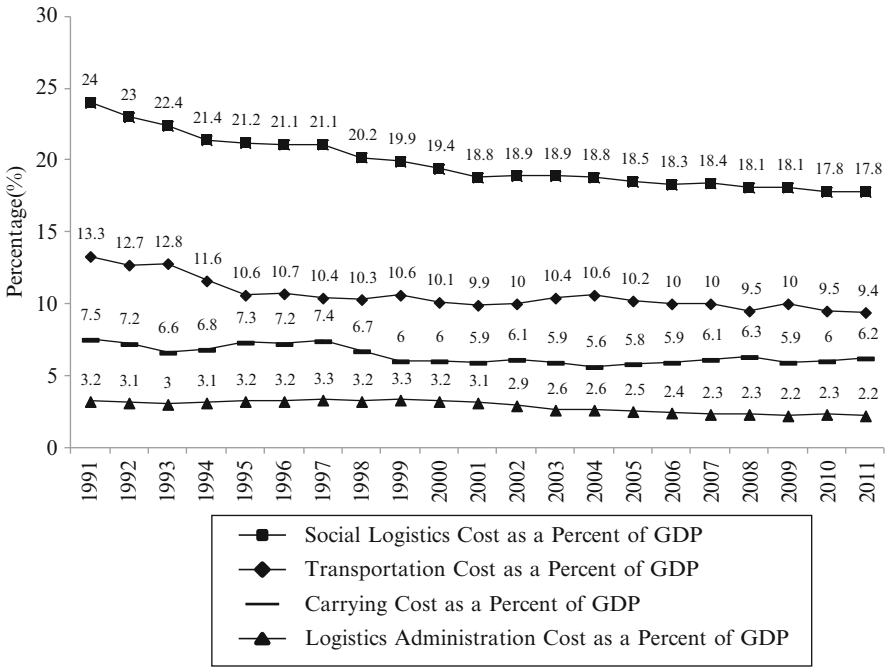

Fig. 11.5 China's social logistics cost as a percent of GDP for 1991–2011 (Source: Data for 1991–2006 are drawn from *China Logistics Yearbook of 2007*; data for 2007–2011 are drawn from the Report on China's Logistics Operations of each year, jointly issued by the National Development and Reform Commission, the National Bureau of Statistics and the China Federation of Logistics and Purchasing)

11.1.2 Logistics Cost and Its Structure of Key Enterprises with Logistics Demand in China

In 2004, the Bureau of Economic Operation Regulation of National Development and Reform Commission, the National Bureau of Statistics and the China Federation of Logistics and the Purchasing began to carry out the statistical survey on logistics status of key industrial, wholesale and retail enterprises nationwide to grasp the cost, structure and development condition[3] of enterprises with logistics demand in China. This part mainly presents an analysis on the logistics cost and the structure of key industrial, wholesale and retail enterprises nationwide for the period from 2005 to 2010.[4]

[3] The survey covered primary Industrial wholesalers and trade-oriented enterprises. The industrial enterprises surveyed mainly engaged in nine industrial categories, including coal, cement, steel, petroleum and petrochemical, chemical industry, etc.

[4] Since statistical indicators of 2004 are different from those of the following years, only the conditions from 2005 to 2010 are analyzed in this report.

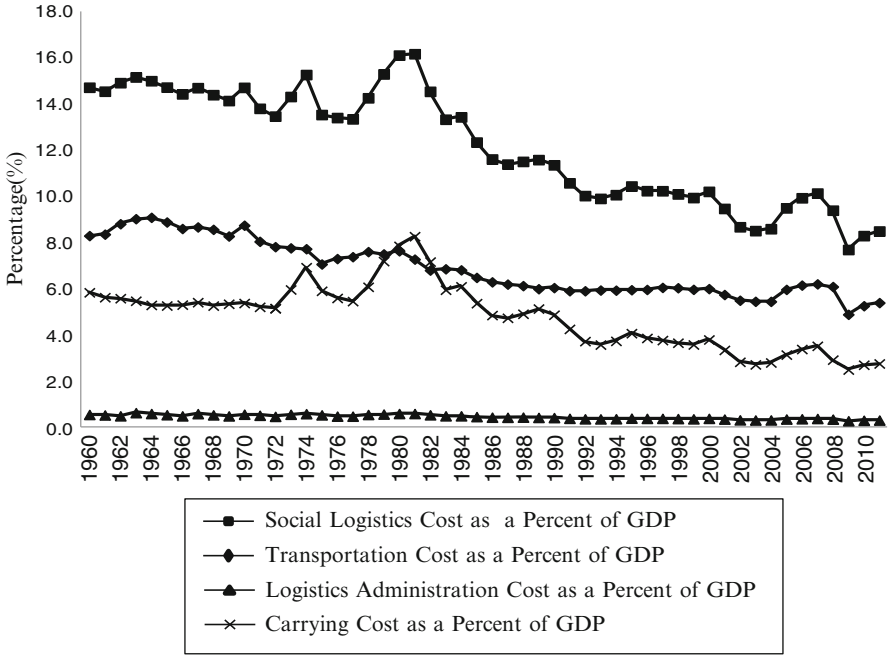

Fig. 11.6 Social logistics cost as a percent of GDP of the US for 1960–2011 (Source: Data drawn from *the 12th–23th Annual State of Logistics Report*, http://cscmp.org/memberonly/state.asp)

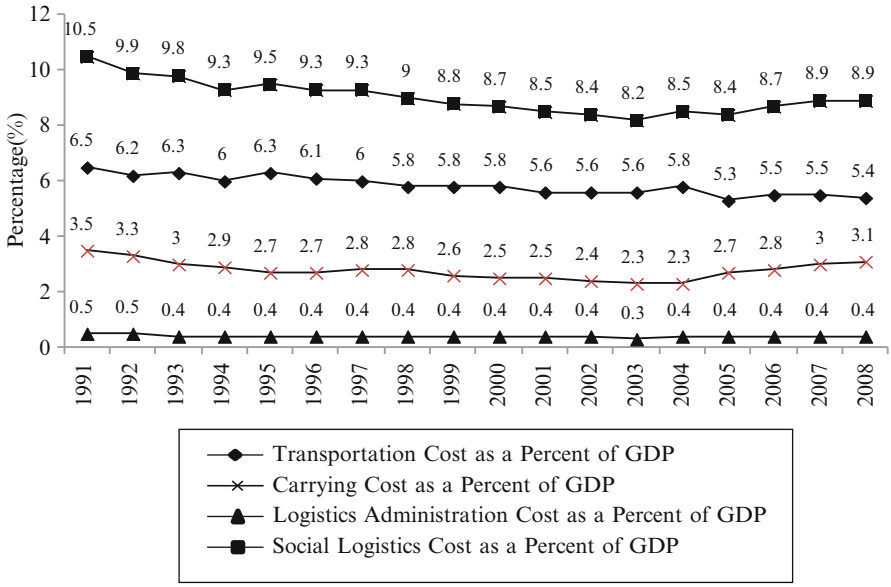

Fig. 11.7 Social logistics cost as a percent of GDP of Japan for 1991–2008 (Source: Data drawn from the *Logistics Cost Report (2010)*, Japan Institute of Logistics System, March, 2011)

11.1.2.1 Logistics Cost of Enterprises

Total logistics cost of China's industrial, wholesale and retail enterprises shows a momentum of rapid growth as shown in Table 11.1. The average annual growth rate of 2005–2010 reached 20.2 %, which is higher than the 16.5 % average growth rate of total social logistics cost nationwide in the corresponding period. Except for the 8.2 % growth rate in 2009 due to the impact of global financial crisis, all other years during this period have exhibited a rapid growth. Nearly all costs, except the cost of damaged goods, maintained a double-digit growth. Meanwhile, along with the acceleration of construction of China's Internet in recent years, the expenses for information and related services in enterprise's logistics cost exhibited a conspicuous growth trend with the average growth rate up to 50.5 %.

11.1.2.2 Logistics Cost Structure of Enterprises

The logistics cost structures of industries such as the agricultural and non-staple food processing industry, chemical industry, medical industry, automobile industry, electrical machinery and equipment manufacture industry, petroleum processing industry and papermaking and paper product industry for 2009 are shown in Table 11.2. The data shows that transportation cost accounts for the biggest proportion in total logistics cost. Besides, the transportation cost of industries with relatively lower product value amount to a much higher proportion, which is generally over 50 % and even up to 60 %. Whereas for industries with higher product value and relatively complicated logistics operations, such as the medical industry and automobile industry, the combined cost of warehousing and delivery far exceeds those of other industries; this type of cost for the medical industry is even close to 40 %, thus becoming a significant component of cost.

11.1.2.3 Logistics Expense to Sales of Enterprise

One of the indicators of logistics efficiency is the logistics expense to sales. Figure 11.8 displays the average logistics expense percentage of China (2005–2010) and Japan (1994–2010). It can be seen that the average logistics expense percentage of China's key enterprises from 2005 to 2010 is 8.6 %, which is approximately twice the 4.9 % value of Japan's logistics expense percentage in the corresponding period.[5] Also Japan's logistics expense percentage has shown a downward trend in recent two decades, declining from an average of 6.2 % for 1994–2000 to 5.1 % for 2001–2005 and then to 4.9 % for 2006–2010. Therefore, judging by logistics efficiency, a large gap still exists between China and the developed countries.

[5]The survey on Japan's logistics expense to sales involved the manufacturing industry, non-manufacturing industry, wholesaling industry, retailing industry, and other industries.

Table 11.1 Growth rate of logistics cost of key industrial, wholesale and retail enterprises in China for 2005–2010

(Unit: %)

Year	Total cost	Transport	Management	Storage	Damage	Interest	Warehousing	Delivery, distribution processing and packaging	Insurance	Information and related services
2005	18.2	15.6	19.6	—	16.0	17.8	25.4	41.6	25.4	48.0
2006	21.8	21.6	24.9	—	—	31.6	14.0	32.0	29.6	28.3
2007	26.5	29.6	36.8	—	—	26.5	32.3	18.6	18.2	—
2008	28.3	30.7	8.6	35.9	7.0	59.0	43.0	32.8	—	59.0
2009	8.2	1.8	10.7	11.9	2.4	3.6	7.2	17.4	—	—
2010	18.2	13.7	17.2	22.4	6.3	13.8	19.9	29.0	57.2	66.6
Average	20.2	18.8	19.6	23.4	7.9	25.4	23.6	28.6	32.6	50.5

Note: "—" means missing data in the survey

Source: Compiled from the *Report of Statistic Survey on Logistics of National Key Enterprises* (2005 ~ 2010), jointly issued by the National Development and Reform Commission, the National Bureau of Statistics and the China Federation of Logistics & Purchasing

Table 11.2 Logistics cost structure of some industries in China in 2009

		(Unit: %)							
Industry	Total	Transport	Warehousing	Delivery	Management	Interest	Packaging	Distribution processing	Others
Agricultural and non-staple food processing industry	100	54.9	12.7	8.2	14.0	3.9	2.1	0.6	3.6
Chemical industry	100	67.1	3.5	5.5	15.5	4.9	3.5	—	—
Medical industry	100	45.8	18.2	18.9	—	17.1	—	—	—
Automobile industry	100	46.2	12	18.7	—	—	6.5	—	16.6
Electrical machinery and equipment manufacture industry	100	60.4	4.1	0.2	20.6	2.7	10	0.2	1.8
Petroleum processing industry	100	55.1	14.3	1.1	16.7	5.5	5.5	1.8	—
Papermaking and paper product industry	100	52.3	7.7	0.5	17.8	6.5	6.6	6.1	2.5

Note: "—" means that these cost items were not included in the report

Source: Compiled from the analysis report on logistics cost of relevant industries in *China Logistics & Purchasing*, Volume 11 of 2011 Issue, released by the China Federation of Logistics & Purchasing and the China Logistics Information Center

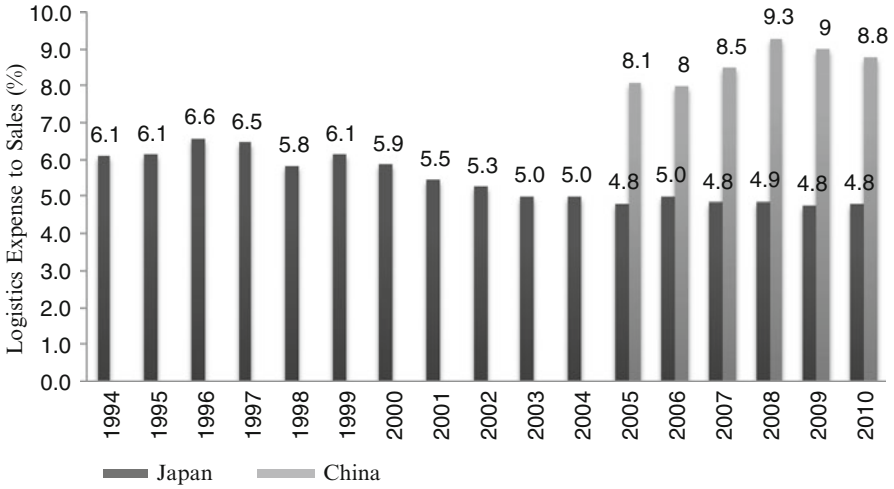

Fig. 11.8 Comparison of logistics expense to sales of China and Japan data (Source: Base on data in the *China Logistics Yearbook* (2011) and the *Logistics Cost Report* (2010) by Japan Institute of Logistics System)

Among major industries, in 2009, the logistics expenses to sales in the papermaking and paper product industry, the agricultural and supplementary food processing industry, the chemical industry, the medical industry, the automobile industry and the electrical machinery and equipment manufacture industry are far higher than the average levels of like industries in Japan, as shown in Fig. 11.9. Generally speaking, the higher the product's unit value, the lower its logistics expense to sales. However, such feature was not observed in China's medical industry and automobile industry, whose logistics expense to sales reached 11.3 % and 9.1 % respectively. In the corresponding period, logistics expense to sales of Japan's automobile industry was only 1/3 of that of China, and the logistics expense to sales of Japan's medical industry was much lower-only 6 % of that of China. It is again another obvious indication that China's logistics efficiency still has a sizable margin for improvement as compared with the developed countries.

11.1.3 Primary Business Cost and Structure of China's Logistics Enterprises

While investigating the logistics issues of its key industrial, wholesale and retail enterprises, China also conducted a statistic survey on the operations performance of key logistics enterprises, so as to gain a better grasp on the development of China's logistics enterprises.[6] This part mainly presents the analysis on the cost and structure of China's key logistics enterprises.

[6] The survey on enterprises of logistics-related industries covered key logistics enterprises, namely, independent legal enterprises with the logistics business operating income over 100 million RMB.

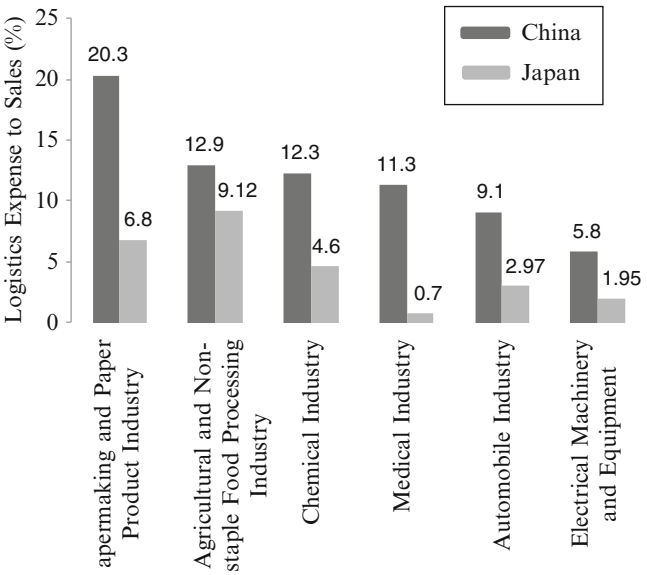

Fig. 11.9 Comparison of logistics expense to sales of certain China's and Japan's industries in 2009 (Source: Base on the analysis report on logistics cost of relevant industries in *China Logistics & Purchasing*, Volume 11 of 2011 Issue, released by the China Federation of Logistics & Purchasing and the China Logistics Information Center)

Table 11.3 Growth rate of primary business cost of China's key logistics enterprises for 2005–2010

	(Unit: %)						
Year	Primary business cost	Transportation cost	Delivery cost	Warehousing cost	Loading and handling cost	Cost of integrated logistics	Cost of information and related service
2005	32.9	32	8.9	36.7	18.9	—	—
2006	13.6	23.7	108.9	41.5	52.6	—	—
2007	27.1	15.8	24.3	29.8	46.5	—	—
2009	−3.6	−20.4	23	10.2	—	33.3	—
2010	31	19.2	—	23.4	—	61.8	136.6
Average	20.2	14.1	41.3	28.3	39.3	47.6	136.6

Note: Data for 2008 were not included in the above table due to incomplete statistics. The "—" mark means that the item was not given in the survey report

Source: Compiled from the *Report of Statistic Survey on Logistics of National Key Enterprises* (2005 ~ 2010), jointly issued by the National Development and Reform Commission, the National Bureau of Statistics and the China Federation of Logistics & Purchasing

Table 11.3 shows the growth rates of primary business cost of China's key logistics enterprises from 2005 to 2010. During this period the average annual growth rate of primary business cost of China' key logistics enterprises was 20.2 %, with relatively higher rates in 2005, 2007 and 2010. Particularly for 2010, the primary business cost grew substantially at a growth rate of 31.0 %. Therein, costs of transport and

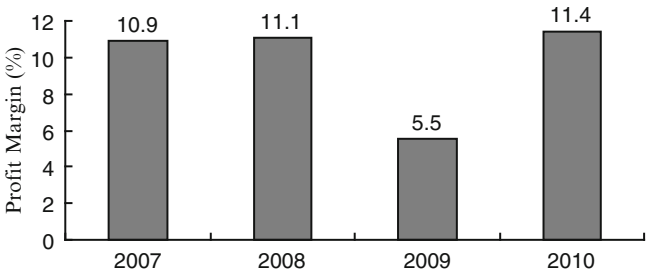

Fig. 11.10 Profit margin of key logistics enterprises from 2007 to 2010 (Source: Compiled from the *Report of Statistic Survey on Logistics of National Key Enterprises* (2007 ~ 2010), jointly issued by the National Development and Reform Commission, the National Bureau of Statistics and the China Federation of Logistics & Purchasing)

warehousing increased by 19.2 % and 23.4 % respectively, while the cost of information and related services and the integrated logistics business cost jumped by 136.6 % and 61.8 % respectively.

Figure 11.10 presents the profit margins from 2007 to 2010 of key logistics enterprises in the survey. The profit margin has remained at about 11 % from 2007 to 2010 (excluding 2009 due to the global financial crisis). However, the profit margins for various types of enterprises differ markedly. Take 2010 for example, the profit margin of transport-type enterprises was 15.1 %, which was the highest among all types. Therein, the profit margin of water transport enterprises and that of integrated enterprises were 11.5 % and 7.5 % respectively, while that of warehousing enterprises and highway transport enterprises were only 2.4 % and 5.9 % respectively. It is thus noted that the profit margins of warehousing and road transport were relatively low in general.

11.1.4 Cost and Structure of China's Highway Transportation

Transportation cost constitutes the principal component of social logistics costs and highway transportation accounts for about 75 % of China's transportation market shares. This section further analyzes the composition of China's transportation costs. The research team of this study surveyed the enterprises specialized in trunk-line transportation, and collected the round-trip costs of typical vehicle models and the year-round businesses operated by the domestic highway transportation enterprises. Over ten trunk lines were investigated, including the ones from Tianjin to Nanjing of Jiangsu Province, from Shanghai to Fuzhou of Fujian Province, from Beijing to Pingxiang of Jiangxi Province, etc. Line length ranges from 1,000 to 2,500 km with the cost structure shown in Fig. 11.11.[7]

[7] Fuel charges include the charges of fuels consumed during transportation; road tolls include road and bridge tolls and illegitimate charges; labor costs include drivers' wages (including endowment insurance, medical insurance, unemployment insurance, employment injury insurance, maternity insurance, and housing fund) and subsistence charges; vehicle costs include the costs on vehicle

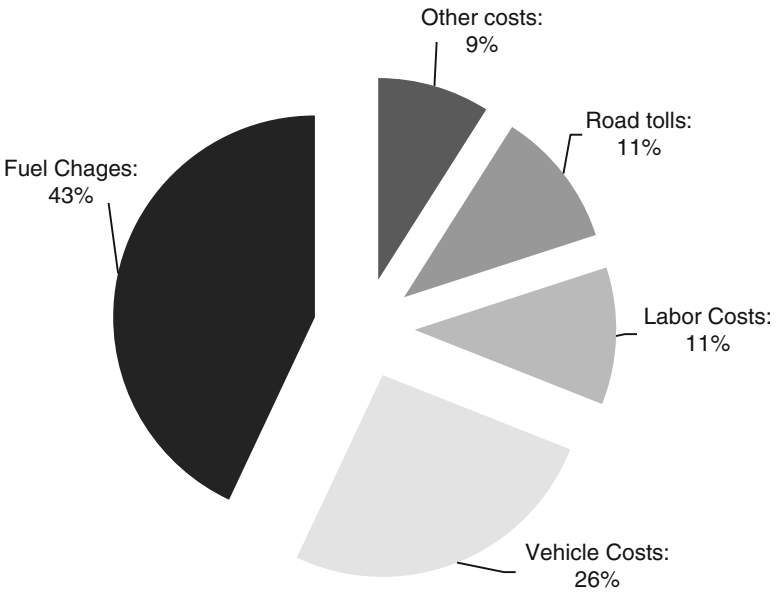

Fig. 11.11 Cost structure of China's trunk-line transportation (Data source: Compiled from the survey data of trunk-line transportation enterprises from October, 2011 to December 2011 by the research team of this study)

Our survey results show that fuel costs account for the largest proportion of highway transportation costs, more than 40 %. Continual rise of fuel prices lead to the direct substantial increase of transportation costs to the transportation enterprises. Secondly, road tolls account for about 25 % of highway transportation costs. At present, China's trunk transportation mainly depends on expressways and arterial roads. Therefore, toll road mileage constitutes the great majority of total mileages, leading to the high percentage of cost for road tolls. Besides, labor costs are also an important part of highway transportation cost at more than 10 %. In recent years, freight drivers' wages rise increasingly with the rise of the average national wage level. Meanwhile, more and more freight vehicles put stricter requirements on the long-distance freight drivers' skills and experience, thus making their wages rise year by year.

11.2 Main Causes for China's Logistics Cost Rises

In recent years, substantial rise of international oil prices, increasing labor costs and gradual increase of warehousing land prices lead to the rise of China's social logistics costs objectively. Meanwhile, expensive road tolls, severe repetitive taxation and illegitimate charges further worsen the problem. These factors are explained in turn in this section.

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depreciation, insurance, inspection, vehicle usage tax and cost for tires; other costs include business tax, handling charges, costs on GPS installation and others. All costs are amortized into a single round trip cost.

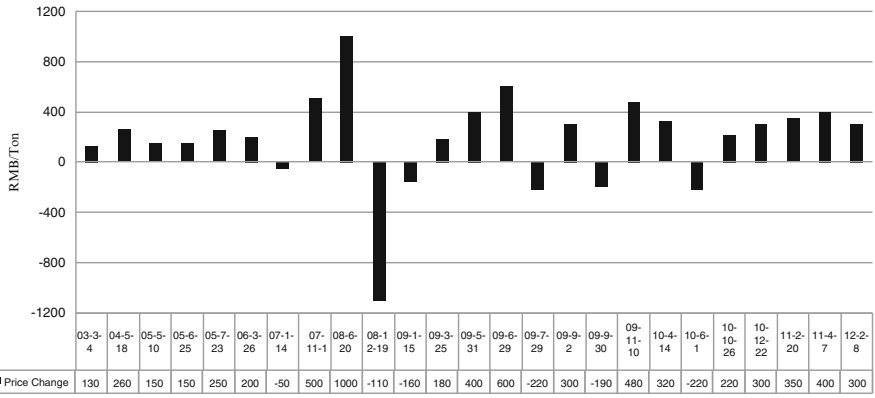

Fig. 11.12 Price adjustments of diesel fuel (RMB/t) in China for 2003–2012 (Source: Base on the announcement of refined oil price adjustments released on the website of the National Development and Reform Commission, http://www.sdpc.gov.cn/zfdj/default.htm)

11.2.1 Substantial Rise in Fuel Costs

With the continuing rapid rise of international crude oil prices, the National Development and Reform Commission adjusted the prices of refined oil product on many occasions. The adjustments of China's diesel prices from 2003 to 2012 are shown in Fig. 11.12. During this period, 25 adjustments have been made, including 19 increases and 6 reductions, resulting in an accumulative price hike of 4,550 RMB/t. After the adjustment on February 8, 2012, the highest average retail price of diesel in all provinces, autonomous regions and central cities reached 8569 RMB/t, which was 2.13 times of the price before the adjustment on March 4, 2003.

Of the enterprises impacted by the fuel price increase, small-scale highway transportation enterprises with weak strength and singular business scope suffer the most. Since the highway transportation industry has a low market concentration, a decentralized operation and a low level of organized management, such enterprises are in a disadvantageous position in the markets having weak bargaining power. Moreover, most of the contracts signed between these enterprises and their clients are per annum, thus most of the operators can only bear the cost pressure brought on by fuel price increase on their own, which also seriously squeezes the business profits.

11.2.2 Increasing Costs and Shortage of Labor

Along with the overall increase in the nation's wage level year by year, the wage level of logistics industry also grows accordingly. Table 11.4 shows the average wages and rate of wage growth of employees in the nation and the urban areas, specialized in transportation, warehousing and postal services from 2004 to 2010.

Table 11.4 Average wages and wage growth of employees in the nation and urban areas specialized in transportation, warehousing and postal services for 2004–2010

	Nationwide		Transportation, warehousing and postal services		
Year	Average wages (RMB)	Growth rate (%)	Average wages (RMB)	Growth rate (%)	Percentage above the national average level (%)
2004	15,920	14.0	18,071	14.7	13.5
2005	18,200	14.3	20,911	15.7	14.9
2006	20,856	14.6	24,111	15.3	15.6
2007	24,721	18.5	27,903	15.7	12.9
2008	28,898	16.9	32,041	14.8	10.9
2009	32,244	11.6	35,315	10.2	9.5
2010	36,539	13.3	40,466	14.6	10.7
Average	25,340	14.7	28,403	14.4	12.1

Source: Compiled from relevant data in the *China Statistical Yearbook* (2005–2011)

During this period, the average annual growth of wage level of China's transportation, warehousing and postal services was 14.4 %. Although this rate was 0.3 % points lower than the average growth rate of the national average wage level, the actual average wage level was 12.1 % higher than that of the national level.

In addition to the already higher wages, labor shortage in the logistics industry forces the enterprises to raise the employees' wages even higher, which intensifies the labor cost increase. In recent years, enterprises' structural labor shortage, following the acceleration of the large-scale development of the West Regions and the continuous adjustment of industrial structures, has become increasingly prominent; likewise, the logistics industry is confronted with similar labor shortage problems. Take long-distance transportation as an example. It needs drivers who are able to bear high risks and great labor intensity and possess good skills and ample experience. It is difficult to recruit suitable personnel even though the drivers' wages of long-distance freight transport are raised substantially. For express delivery enterprises, the seasonal labor shortage has become increasingly severe. Thus these enterprises often need to substantially increase the workers' salaries on special occasions, which lead to a surge in labor costs.

11.2.3 Rising Land Price and Land Use Tax

From 2000 to 2011, China's industrial land prices were rising, with an average annual growth of 3.5 %. Especially from 2005 on, the average growth rate hit 5.0 %. The trend of China's industrial land prices from 2000 to 2011 is shown in Fig. 11.13. Since in China warehousing land is subsumed under the industrial land, the price level of the latter directly raises that of the former.

The tax rate of land use has generally doubled since the *Provisional Regulations of the People's Republic of China on Governing Land Use Tax in Cities and Towns* enacted on January 1, 2007. Higher tax rate was levied when the Regulations

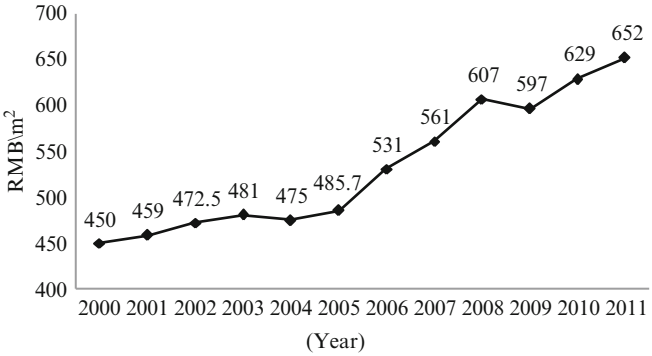

Fig. 11.13 Trends of industrial land prices for China from 2000 to 2011 (Source: Base on relevant data in the monitoring reports of land price released on the website of the Ministry of Land and Resources, http://www.mlr.gov.cn/tdsc/djxx/djjc/)

were implemented in most locales, which greatly increased the tax costs of warehousing-based logistics enterprises.

At present, China's warehousing market is in short supply in general. In 2010, the total area of the nation's general warehouse demands was 701,000,000 m^2, the actual warehouse area was 550,000,000 m^2; the nationwide warehouse supply–demand index was 0.785, indicating a shortage of supply for general warehouses. Nearly 20 % of the existing warehouses are Multi-level ones built in recent years, the rest 80 % are one-storey type of buildings built in different periods; modern warehousing facilities are apparently insufficient.[8]

Driven by multiple factors such as increased land price and land use tax and the shortage of supply in warehousing land, China's warehousing prices grow rapidly. In 2010, the average growth of rent for one-story and multi-level warehouses in China's major cities was 14.9 % and 14.0 %, respectively. The rapid increase of warehouse rent becomes another key factor to inflated logistics costs. The rent level and growth rate of one-story and multi-level warehouses in China's major cities in 2010 are shown in Table 11.5.

11.2.4 Excessively High Road Tolls and Legitimate Charges

The policy of "Road construction by loans and payoff by charging tolls" executed since 1984 in China effectively alleviated the dilemma of the insufficient construction funds for highways and accelerated China's road constructions. However, some problems have appeared in the implementation of the toll road policy. Payoff period for highway loans and the density of toll stations were specified in the *Regulation*

[8] *National Warehousing Development Index*, China Association of Warehouses and Storage, August, 2011.

Table 11.5 Rent level and growth rate of one-story and multi-level warehouses in China's major cities in 2010

	One-story warehouses		Multi-level warehouses	
City	RMB/day · m^2	Growth rate (%)	RMB/day · m^2	Growth rate (%)
Beijing	0.55	7.4	0.91	7.9
Tianjin	0.55	19.6	0.83	1.7
Shanghai	0.80	6.7	1.10	7.4
Guangzhou	0.84	18.3	0.86	6.2
Shenzhen	0.78	26.3	1.24	22.4
Chengdu	0.66	8.2	0.69	9.5
Wuhan	0.45	7.1	0.57	5.0
Shenyang	0.64	8.8	0.76	15.0
Xi'an	0.54	0.0	0.60	5.5
Xiamen	0.50	46.2	0.83	3.8

Source: *National Warehousing Development Index*, China Association of Warehouses and Storage, August, 2011

on the Administration of Toll Roads (hereinafter referred to as the *Regulation*). However, many toll roads were charging fees not in accordance with *the Regulation*, even resulting in serious problems of collecting charges past due date, higher charging standards and other illegitimate and unreasonable charges, as well as non-compliance of the spacing between two toll stations (spots). Fox example, as specified in *the Regulation,* the spacing between two toll-stations on the same main highway shall not be less than 50 km. Yet, the investigation results released by the National Audit Office of the People's Republic of China in 2008 showed that there were 4,328 toll stations in the 18 provinces and cities audited, with 240 in each province. The spacing of 131 toll stations out of 284 on toll roads of one western province was not in compliance with the *Regulation*; among the former, the spacing of 10 toll stations was less than 10 km. The toll collection period of 35 operational roads in 12 provinces and cities was too long and the tolls collected were several times, even over ten times, than the investment costs. Charging standards were raised in 7 provinces and cities with the total overcharged tolls of 8.2 billion RMB.

Besides, the standards of toll charges on China's expressways are too high overall, and without a unified national standard. Due to much freedom on approval of charging standards in local government, and the differences in expressways' average cost of construction, utilization rate and payback period, the charging standards for the same vehicle type vary widely. Based on the expressway charging standards of all provinces and Special Municipalities released on the website of the Ministry of Transport, the charge for private autos is between 0.3 and 0.8 RMB/km, with an average of 0.49 RMB/km,[9] while that of vans weighing 10–15 t is between 0.85 and 3.0 RMB/km, with an average of 1.62 RMB/km. After the "charge by weight" rule was implemented, the basic charge of roads in most of provinces and cities across the country is between 0.07 and 0.09 RMB/t · km, averaging 0.08 RMB/t · km. If

[9] It was according to the expressway charging standards in some of China's provinces including Ningxia, Heilongjiang, Shanghai, Jilin, Qinghai, Anhui, Tianjin, Jiangxi, Guangxi, Liaoning, Gansu, Beijing, Sichuan, Fujian, Shanxi, Yunnan and Chongqing.

calculated as per van with total weight of 20 t, the average charge is up to 1.6 RMB/km.[10] In New Jersey of the United States, it only costs autos 3.85 USD to run on the 173 mile-long (about 277 km) Interstate Garden Expressway (equivalent to 0.3 RMB/km), and 4.6 USD to run on the 118 mile-long (about 190 km) Turnpike Expressway (equivalent to 0.15 RMB/km), which illustrates a lower charging standards comparatively.[11] Over-dense toll stations, over-long toll road mileage, and higher and illegitimate charges make China's vehicle tolls account for over 2 % of per capita GDP, far exceeding the average level of Europe, the United States, Japan and other countries.[12]

11.2.5 Disunity of Tax Rates and Repetitive Taxation

Logistics is a composite service industry integrating transportation, warehousing, forwarding, and information industry as a whole, and also an emerging inter-trade, cross-sector comprehensive industry. Logistics activities involve transportation, warehousing, postal services and many links in wholesale and retail such as packaging, distribution processing and delivery. The current national policies on business tax collection fail to support the fully-integrated operating mode of logistics with the major problem shown in the following two aspects.

The first problem is the disunity of taxable items, taxation base and rate of various agency segments. In accordance with provisions in the *Provisional Regulations of the People's Republic of China on Business Tax* and relevant documents, taxable items and taxation rates involved in logistics business include 3 % tax rate for transportation, 3 % tax rate for express business and 5 % tax rate for businesses such as warehousing, leasing, agency and other services. Different taxable items shall be accounted separately, or else higher tax rate will be applicable. For most of the logistics enterprises engaging in multiple operations, different taxable items, taxation bases and tax rates should be applied. However, since it is difficult for these enterprises to clearly distinguish among the various operations, higher tax rates are often paid for low-tax-rate businesses.

The second problem refers to the serious issue of repetitive taxation. Since logistics business covers a wide range of activities, logistics enterprises often provide integrated services for clients by integrating social resources, in the form of contracting the overall business, then doing subcontracting and even multi-level subcontracting. However, under the current business tax policies, taxes will be paid in each subcontracting, so the problem of repetitive taxation will become more and more serious while finer specialization, further division of labor and more transactions take place.

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[10] It was according to relevant feeds of transportation management of the Ministry of Transport of the People's Republic of China. http://www.moc.gov.cn/zhuzhan/yunshuguanli/jiaotongguifei/.

[11] Wang Liangyong. *Road Management in America and Enlightenment*. Road, 2001 (3): 80–82.

[12] The World Bank. *China's Expressway: Connected to the Public and Markets to Realize an Equitable Development*. http://www.shihang.org/research/2007/05/14813263/chinas-expressways-connecting-people-markets-equitable-development?lang=zh.

11.3 Policies and Measures to Lower Logistics Costs in China

Confronted with various problems during the logistics development in recent years, the Chinese Government has released many policies and measures to promote the sound development of the logistics industry. Recently, the relevant Ministries have released the *Pilot Proposals for the Change from Business Tax to Value-Added Tax* and incentive measures on land use tax, and developed the special clearance plan on toll roads to promote the sound development of the logistics industry.

11.3.1 Policies and Measures to Promote the Sound Development of the Logistics Industry

Based on the *Notification of the State Council on Issuing Adjustment and Development Plan of Logistics Industry*, in August 2011, the State Council specially issued the *Opinions of the General Office of the State Council on the Policies and Measures for Promoting the Sound Development of the Logistics Industry,* and proposed nine measures to promote the sound development of the logistics industry. These measures include effectively easing the tax burden of logistics enterprises, giving more support to logistics land policies, facilitating the access to logistics vehicles, accelerating the reform of logistics management systems, encouraging the integration of logistics facilities and resources, advancing logistics technology innovation and application, increasing the investment in logistics industry, giving priority to the development of agricultural product logistics and strengthening the organization and coordination.

Among the nine measures, items such as "effectively easing the tax burden of logistics enterprises," "giving more support to logistics land policies," "facilitating the access to logistics vehicles," are directly aimed to solve the practical problems in taxation, warehousing land, and road tolls that logistics enterprises face, and are helpful in reducing the social logistics costs and easing the burden of logistics enterprises.

11.3.2 Pilot Proposal for the Change from Business Tax to Value-added Tax

The Ministry of Finance and the State Administration of Taxation issued the *Pilot Proposals for the Change from Business Tax to Value-Added Tax* in November, 2011. The main taxation consideration in the pilot project includes rates, formats, and bases of taxation. The *Pilot Proposals* stipulated that, besides the current value-added standard tax rate of 17 % and the lower 13 % tax rate, two levels of

lower tax rates, 11 % and 6 % are added. The 11 % rate is applicable to transportation and the 6 % rate is applicable to some other modern service businesses. It is expected that after the implementation of *the Pilot Proposals*, the overall tax burdens of the pilot businesses will not increase or will drop slightly, and the problem of repetitive taxation will essentially be eliminated. *The Pilot Proposals* have begun test operation in the transportation and some modern service sectors in Shanghai.

11.3.3 Halved Levy of Land Use Tax

To implement the *Opinions of the General Office of the State Council on the Policies and Measures for Promoting the Sound Development of the Logistics Industry* as soon as possible, the Ministry of Finance issued the *Notice on Urban Land Use Tax Policies for the Land Used by Logistics Enterprises for Bulk Commodity Storage Facilities* in January, 2011. As specified in *the Notice*, the urban land use tax of the bulk commodity storage facilities owned by logistics enterprises (including those for private use and for lease) will be levied at 50 % of the tax rates applicable to the corresponding land levels. Furthermore, the *Notice* specifically spells out that logistics enterprises refer to those businesses specialized in providing warehousing and delivery services for industrial and agricultural productions, circulation, import and export and livelihood items of citizens. The bulk commodity storage facilities refer to those with the floor area over 6,000 m^2, which are used to store 12 types of agricultural products and materials including grains, 16 kinds of minerals such coal and seven groups of manufactured goods such as industrial raw materials and food. Consequently, the issuance of the measures is favorable for logistics enterprises to reduce their warehousing land costs, thus lowering the carrying costs on most of the nation's basic raw materials, manufactured goods and agricultural products.

11.3.4 Special Clearance Actions for Toll Roads

The Ministry of Transport, the National Development and Reform Commission, the Ministry of Finance, the Ministry of Supervision and other related Ministries jointly issued the *Notice on Launching the Special Clearance Tasks of Toll Roads* in June, 2011. The *Notice* mandated that problems of collecting road tolls past due date, higher toll standards and other illegitimate and unreasonable charges shall be cleared out thoroughly, fee-charging items which expired shall be repealed, toll stations whose spacing is not in accordance with proper regulations shall be canceled, and all acts of illegal charges shall be corrected. The following aspects are included. (1) During the special clearance period, all provinces, autonomous regions, and special Municipalities shall strictly examine and approve any new charging items on ordinary roads at level 1 or below, and suspend approving the financing of toll road assets by listing on the stock market and the acquisition of

the state-owned toll road assets by foreign enterprises. (2) It is not allowed to extend the charging period of the reorganized and expanded ordinary roads at level 1 or below. (3) It is forbidden to increase the for-profit ordinary roads. (4) Provinces in Western Regions shall gradually and orderly accelerate the pace of cancelling the charge on governmental-loaned secondary roads.

The actions of cancelling overdue charges and other illegitimate and unreasonable charges are favorable for reducing the higher charging standards, and easing the burden of road users, thus reducing logistics costs.

11.4 Summary

This chapter introduces the current status of China's logistics costs, the main causes for logistics cost increase and policies and measures instituted by the Chinese Government to lower logistics costs. With the rapid development of the nation's economy, China's social logistics costs also grow rapidly. There are huge differences between China and the developed countries in terms of the social logistics costs as a percent of GDP or the logistics expense to sales. Substantial rise of international oil prices, increasing labor costs and gradual increase of warehousing land prices have led to the rise of China's social logistics costs objectively. Meanwhile, expensive road tolls, severe problems in repetitive taxation and illegitimate charges further raise China's social logistics costs. Confronted with various problems in logistics development during recent years, the Chinese Government has released many policies and measures to promote the sound development of the logistics industry. Recently the relevant Ministries have issued the *Pilot Proposals for the Change from Business Tax to Value-Added Tax* and incentive measures on land use tax, and developed the special clearance actions on toll roads to promote the sound development of the logistics industry.

Chapter 12
Coordinated Development of Manufacturing and Logistics in China

Weihua Liu

Manufacturing industry creates the demand base for the development of logistics, and modern logistics, in turn, is an important means to promote core competitiveness of the manufacturing enterprises. From 2007 onward, with full-pledged support from the National Development and Reform Commission and other related departments, the coordinated development of China's manufacturing industry and logistics industry ("the coordinated development" for short hereinafter) was advanced markedly and many typical modes and cases of coordinated development emerged, which provide a good reference for the manufacturing industry to accelerate the release of their logistics demand and for the logistics industry to elevate their service level.

This chapter covers four parts. Part one introduces the background and the course of the coordinated development of manufacturing and logistics in China. Part two shows the current situation and basic modes of the coordinated development. Part three presents an analysis of the effects of implementation and the problems of the coordinated development. Part four puts forth the trend of and suggestions on the coordinated development.

12.1 Background and Course of the Coordinated Development of Manufacturing and Logistics

The coordinated development of manufacturing and logistics is an indispensible requisite for reducing cost for manufacturing enterprises and also the objective requirement for accelerating the development of logistics enterprises. The necessity to accelerate the coordinated development becomes even more urgent for China's economic development, which had been greatly impacted by the global financial crisis.

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Current Chinese Economic Report Series, DOI 10.1007/978-3-642-34525-8_12,

12.1.1 Background of the Coordinated Development

Viewed from the manufacturing enterprises, the change in production mode is being accelerated on a global scale and the pressure from market competition requires the manufacturing enterprises to continually strengthen their research and development, and to focus on their core competence in manufacturing. Manufacturing enterprises often integrate, segregate and outsource logistics and other productive services, by blending self-operating and outsourcing services. Objectively, the transformation of production mode requires the manufacturing enterprises to strengthen their coordinated development with logistics enterprises to realize the cooperation and win-win benefit.

In terms of logistics enterprises in China, they are generally "small in scale, scattered in organization, poor in service and weak in capability," and have not been thoroughly transformed so far. Many logistics enterprises have singular service mode and low integrated service capability, lagging far behind the international logistics enterprises. To alleviate the current predicament of low-level vicious competition, it is urgent for the logistics enterprises to strengthen their strategic cooperation with the manufacturing enterprises and improve their service capability and level.

Due to the impact of the international financial crisis, manufacturing enterprises in China are facing the quandary of reduced demand, increased cost, insufficient export momentum and sliding operation performance; Meanwhile, logistics enterprises are confronted with shrunk market demand, dropped service price, and more difficulties in business operations. Hence, coordinated development is not only favorable for manufacturing enterprises to reduce the logistics cost, but also beneficial for logistics enterprises to expand the market demand. Therefore, the necessity to accelerate the coordinated development between the two industries is even more pronounced under the aftermath of the global financial crisis.

12.1.2 The Government's Main Courses in Promoting the Coordinated Development

In September 2007, the National Development and Reform Commission held the "First National Conference on Coordinated Development of Manufacturing and Logistics" in Shanghai, in which it pushed forward the outsourcing of logistics for the manufacturing industry, and advocated the joint development of the manufacturing and the logistics industries to develop jointly. Henceforth, the coordinated development of manufacturing and logistics in China was officially launched.

In March 2009, the State Council officially released the *Program of Adjusting and Revitalizing Logistics* which listed "the coordinated development of manufacturing and logistics" as one of the nine key projects therein.

In April 2010, to solidify the implementation of the *Program of Adjusting and Revitalizing Logistics*, the Office of Intra-departmental Conference on National

Modern Logistics issued the *Opinions on Promoting the Coordinated Development of Manufacturing and Logistics*. In September of the same year, the Conference Office also released the *Notice on Demonstration of the Coordinated Development of Manufacturing and Logistics*. In December 2011, the National Development and Reform Commission completed the selection of 130 enterprises as the nation's first group of demonstration enterprises of the coordinated development, which ushered the coordinated development into the demonstration and promotion stage.

12.2 Current Status and Basic Modes of the Coordinated Development of Manufacturing and Logistics

Governments at all levels have actively launched supportive policies and incentive measures to provide favorable settings for the implementation of coordinated development. Many manufacturing enterprises and logistics enterprises have also actively implemented coordinated development and therefore engendered many successful cases and some typical development modes, which yield beneficial experiences and references for the coordinated development in China.

12.2.1 Current Status of the Coordinated Development

12.2.1.1 Concerted Efforts by the State Ministries and Local Governments

In recent years, relevant State ministries and local governments at all levels have treated the coordinated development as an important project in promoting the logistics development of manufacturing industry.[1] The National Development and Reform Commission held the National Conference on the Coordinated Development of Manufacturing and Logistics three times in 2007, 2009 and 2011 respectively. Since 2009, the National Development and Reform Commission and the Office of Intra-departmental Conference on National Modern Logistics had promoted the coordinated development successively by issuing various forms of policy documents, publicizing in companies, special planning and establish of key projects, which greatly promoted the release of logistics demand of the manufacturing industry and also enhanced the service level of the logistics industry.

Furthermore, leading departments in logistics and related industry associations in many provinces (special Municipalities and autonomous regions) actively fostered the environment for coordinated development. More than half of the

[1] Liu Weihua, Ge Meiying, "*Review of Logistics Development of Manufacturing in 2011 and Prospect in 2012*," *China Logistics Development Report,* China Logistics Publishing House, Beijing, China, 2012.

provinces and cities in China, including Shanghai, Tianjin, Shandong and Hunan, published supporting implementation plans[2] of the *Program of Adjusting and Revitalizing Logistics* and took the coordinated development of manufacturing and logistics as one of their major tasks. The governments of Shanghai, Fujian, Shandong, Hunan, Guangzhou, Anhui, Henan, Zhejiang and Shaanxi encouraged the coordinated development by means of setting planning guides and providing special funding support. For example, Shanghai allocates 200 million RMB each year from its municipal financial budget as seed funds to encourage manufacturing enterprises to develop production services and provides certain subsidies or interest discount for loans to key projects. Shandong formulated the *Opinions on the Implementation of Accelerating the Interactive Development of Manufacturing and Logistics* and put forward the main objectives and eight major measures to promote the interactive development of the two industries in Shandong.

12.2.1.2 Local Governments and Associations Actively Promote the Coordinated Development Concept

Many provinces, cities and related associations successively hosted diverse conferences and training sessions to study the subject of coordinated development. For example, in January 2011, Anhui Province held "the First Conference on the Coordinated Development of Manufacturing and Logistics" in Wuhu. In April 2011, China Communications and Transportation Association convened the "2011 Annual Meeting on the Coordinated Development of Manufacturing and Logistics" in Beijing. In November 2011, the Sichuan Development and Reform Commission, Sichuan Provincial Department of Commerce, Sichuan Provincial Department of Transport and Chengdu Logistics Association jointly held the "2011 Summit of Coordinated Development of Manufacturing and Logistics." In addition, many provinces and cities have provided suitable platforms to strengthen the communication between manufacturing and logistics, and to entertain discussions on issues like promoting the socialization and specialization of logistics services and achieving the holistic interactive development of manufacturing and logistics under the new circumstances. Such meetings and trainings also popularized the tenets of coordinated development among the enterprises.

12.2.1.3 Active Implementation of the Manufacturing and Logistics Enterprises

With strong support from the governments at all levels and industry associations, manufacturing enterprises and logistics enterprises have actively implemented the

[2] *China Modern Logistics Development Report (2010)*, compiled by the Bureau of Economic Operations Adjustment of National Development and Reform Commission, and the Research Center of Logistics, Nankai University, China Logistics Publishing House, Beijing, China, 2010.

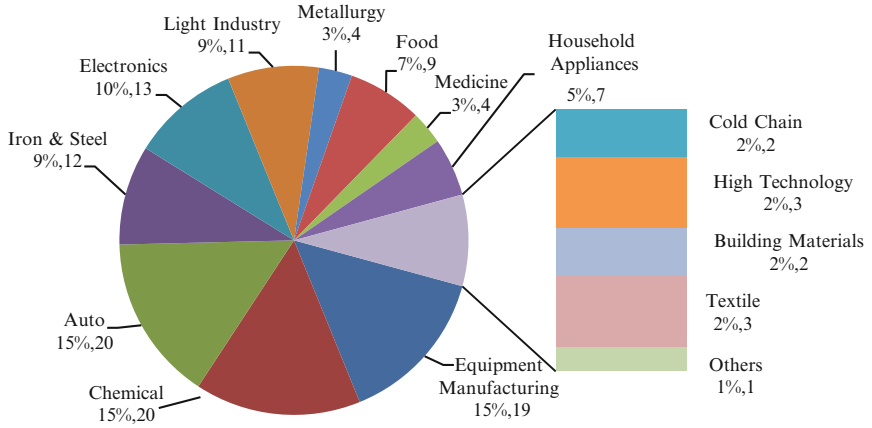

Fig. 12.1 Distribution of industries of the demonstration enterprises of the coordinated development

coordinated development with increasing scope. According to a survey,[3] in 2010, about 74.6 % of the local governments have begun to promote the coordinated development. The coordinated development is commonly implemented in the manufacturing industries of electronic and communication equipment, food/beverage/tobacco/liquor, building material, mechanical equipment and petrochemicals. Of the 130 national demonstration enterprises of the coordinated development designated in 2011, the business covers equipment manufacturing, iron and steel, electronics, auto, chemicals, household appliances, building material, food and other main manufacturing industries. The distribution of industries and the regional distribution of these demonstration enterprises are shown in Figs 12.1 and 12.2, respectively.

12.2.2 Basic Modes of the Coordinated Development

In the course of the coordinated development, many manufacturing enterprises gradually developed from outsourcing simple transport (storage) activity towards outsourcing the entire logistics business, and the logistics enterprises also transformed from offering singular logistics service into offering integrated logistics services. Both industries of the coordination development adopted the Milk-run, Vendor Management Inventory, JIT Production and other supply chain management practices to create many new development modes. Classification and typical cases of the coordinated development modes are shown in Table 12.1.

[3] *China Modern Logistics Development Report* (2011), compiled by the Bureau of Economic Operations Adjustment of National Development and Reform Commission, and the Research Center of Logistics, Nankai University, China Logistics Publishing House, Beijing, China, 2011.

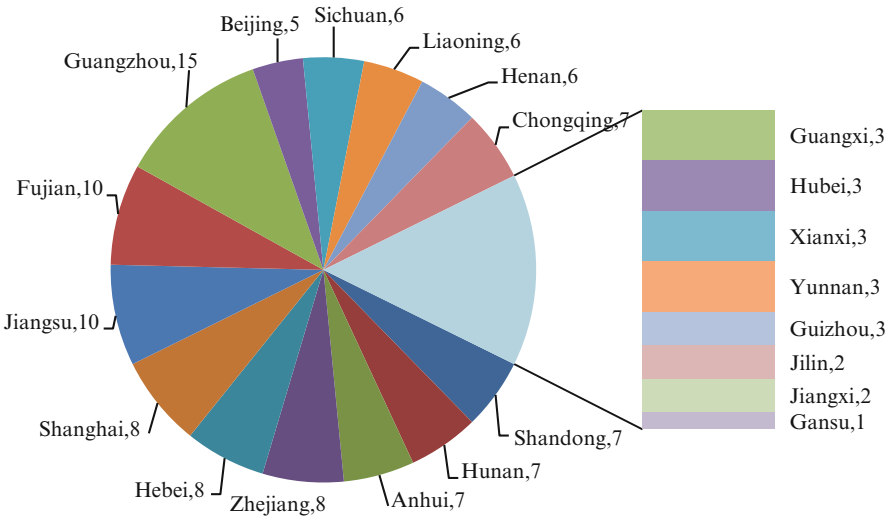

Fig. 12.2 Distribution of provinces and cities of the demonstration enterprises of the coordinated development (Source: *Logistics Data of Reporting Entities for National Demonstration Enterprises of the Coordinated Development*, published by the National Development and Reform Commission, March 2011)

12.3 Effects of Implementation and Problems of the Coordinated Development

After years of evolution, the coordinated development is promoted nationwide and some progresses have been made in regard to logistics operations efficiency, logistics service quality, logistics cost and informatization management for both sides involved in the coordinated development. However, viewed from implementing experience, there are still some problems in propagating the operations and advancing the development. In the future, there is a need to expand the scope of application, deepen the cooperative relationship, improve the operations efficiency, accelerate the creation of new development modes, and establish a more beneficial industrial coordination environment.

12.3.1 Effects of Implementing the Coordinated Development

12.3.1.1 Steadily Improving Logistics Efficiency

According to the data provided by the 261 reporting demonstration enterprises of the coordinated development,[4] order-to-delivery cycle of the sample manufacturing enterprises is reduced from the previous average 14.9 days to 6.5 days after the

[4] Zhang Xiaodong, "Analysis on the Comprehensive Effects of the Coordinated Development of Manufacturing and Logistics in China," document of the Third National Conference on the Coordinated Development of Manufacturing and Logistics, December 15, 2011.

Table 12.1 Classification and typical cases of the coordinated development modes

Classification mode	Coordinated development mode	Characteristics of the coordinated development mode	Typical cases
Classified based on outsourcing level and conceding of enterprise's management right	Single service is outsourced and management right is reserved	Single logistics service of manufacturing enterprises (such as transportation) is outsourced to the third party logistics enterprise, and manufacturing enterprises reserve the management right	Coordinated development of Shanghai GM and Anji-TNT Automotive Logistics. Co., Ltd.
	Multiple services are outsourced and management right is reserved	Multiple logistics service modules of manufacturing enterprises are outsourced to the third party logistics enterprise, and manufacturing enterprises reserve the management right	Coordinated development of Shanghai Jahwa United Company Ltd. and Shanghai Huier Logistics Co., Ltd.
	All services are outsourced and management right is reserved	All logistics services of manufacturing enterprises are outsourced to the third party logistics enterprise, and manufacturing enterprises reserve the management right	Coordinated development of SAMSUNG Global Distribution Center (Suzhou) and Suzhou Delta Logistics Co., Ltd.
	Manufacturing enterprises establish subordinated logistics enterprises independently	Manufacturing enterprises establish subordinated solely-invested logistics enterprises, and all logistics services are transferred to professional logistics enterprises; manufacturing enterprises have no management right regarding logistics	Coordinated development of Jiangsu Hailong International Trading Co., Ltd. and Huai'an Hailong Cold Chain Logistics Co., Ltd.
	Manufacturing enterprises establish joint venture logistics enterprises	Manufacturing enterprises establish joint venture logistics enterprises with other enterprises, and logistics services are totally transferred to professional logistics enterprises; manufacturing enterprises have no management right regarding logistics	Coordinated development of TSINGTAO Brewery Co., Ltd. and China Merchants Logistics Holding Co., Ltd.
	Manufacturing enterprises separate their logistics system	Manufacturing enterprises outsource all logistics services to the third party logistics enterprise, logistics system is thoroughly separated; and manufacturing enterprises have no management right regarding logistics	Coordinated development of Tibet 5100 Water Resources Holdings Ltd. and China Railway Express Co., Ltd.

(continued)

Table 12.1 (continued)

Classification mode	Coordinated development mode	Characteristics of the coordinated development mode	Typical cases
Classified according to number of subjects involved in the coordinated development	One-to-one coordination	Coordinated development of one manufacturing enterprise and one logistics enterprise	Most enterprises involved in the coordinated development adopt this mode
	One-to-many coordination	Coordinated development of one manufacturing enterprise and many logistics enterprises; or coordinated development of many manufacturing enterprises and one logistics enterprise	Coordinated development of Zhongjie Huanzhou Supply Chain Co., Ltd. and Yuhuan Auto Industrial Cluster
	Many-to-many coordination	Coordinated development of many-to-many enterprises respectively in manufacturing enterprises park and logistics enterprises park	Coordinated development between Shanghai Lingang Heavy Equipment Industrial Park and Lingang Equipment Manufacturing Professional Logistics Base
Classified according to the application of coordination technology	Apply existing advanced technical equipment	Apply various existing advanced technical equipment during the coordinated development, such as GPS, RFID, etc.	Coordinated development of Jushi Group Co., LTD. and Zhejiang Yushi International Logistics Co., Ltd.
	Improve rules on the use of technical equipment	Improve rules on the use of existing technical equipment during the coordinated development	Coordinated development of Hangzhou Iron & Steel Group Company and Zhejiang Bada Logistics Co., Ltd.
	Customized special technical equipment	Customized special technical equipment for logistics service during the coordinated development	Coordinated development of Bayer Material Science and Technology (China) Co., Ltd. and Shanghai Huayitianyuan Chemical Logistics Co., Ltd.

Classified according to service links of coordinated development	Coordination on supply link	Manufacturing enterprises outsource purchasing and supply service to logistics enterprises	Coordinated development of CMST Qingdao CO., Ltd. and Qingdao Beihai shipbuilding Heavy industry CO., Ltd.
	Coordination on production link	Manufacturing enterprises outsource logistics service in production link to logistics enterprises	Coordinated development of FOTON Motor Co., Ltd. and FOTON Motor logistics Co., Ltd.
	Coordination on sales link	Manufacturing enterprises outsource logistics service in sales link to logistics enterprises	Coordinated development of Chery Automobile Co., Ltd. and Changjiu Logistics Co., Ltd. (Wuhu)
	Coordination on multiple links	Manufacturing enterprises outsource multiple supply chain links to logistics enterprises	Coordinated development of Shandong Lingong Construction Machinery Co., Ltd. and Shandong Lichen Logistics Co., Ltd.
	Coordination on all links of supply chain	Manufacturing enterprises outsource all logistics services on upstream and downstream links of supply chain to logistics enterprises	Coordinated development of Tibet 5100 Water Resources Holdings Ltd. and China Railway Express Co., Ltd. Coordinated development of Zhongjie Huanzhou Supply Chain Co., Ltd. and Zhejiang KAIDI Automotive Parts Industry Co., Ltd.

Note: Reserving management right means that the manufacturing enterprises maintain control over the logistics service
Source: "*Cases of National Coordinated Development of Manufacturing and Logistics*," the Office of Intra-departmental Conference on National Modern Logistics, China Logistics Publishing House, 2011; "*Survey Report on Logistics Development of the Six Core Industries in Shanghai*," Shanghai Municipal Economic and Informatization Commission, October 2007

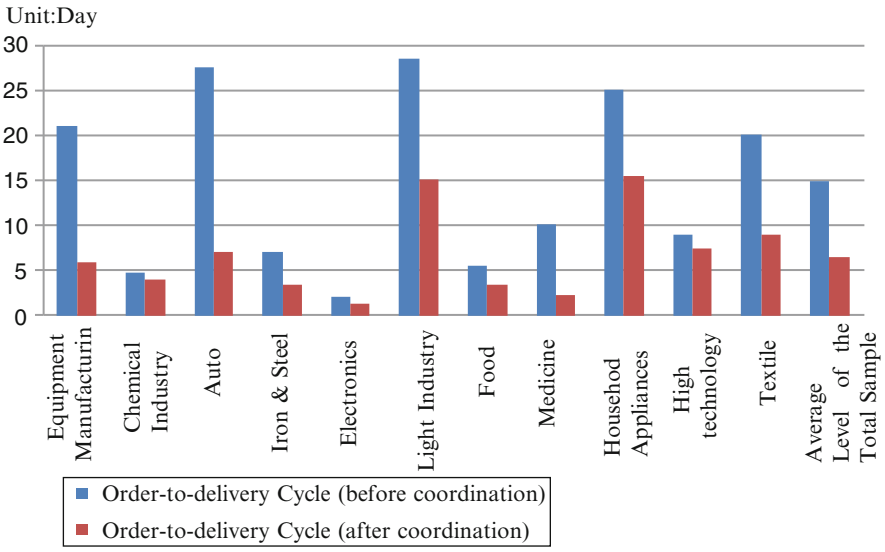

Fig. 12.3 Order-to-delivery cycle before and after the coordinated development (Source: *Logistics Data of Reporting Entities of National Demonstration Enterprises of the Coordinated Development*, published by the National Development and Reform Commission, March 2011)

coordinated development. Wherein, order-to-delivery cycle for electronics industry is the shortest at the average of 1.4 days, and that of the chemical industry, food, and medicine industries is less than the overall average level of the whole sample, as shown in Fig. 12.3.

After the coordinated development, the average turnover time of the sample manufacturing enterprises is reduced from 34.6 days to 21 days. Wherein, the average turnover time in the textile industry is the shortest at 3.5 days, and that of the auto, electronics, household appliances, food, metallurgy, and chemical industry are than the overall average level of the whole sample, as shown in Fig. 12.4.

12.3.1.2 Noticeably Improved Logistics Service Quality

According to the data provided by the 261 reporting entities of demonstration enterprises of the coordinated development,[5] the average order fulfillment rate of the sample manufacturing enterprises in South China, Southwest China, East China and North China after the coordinated development is higher than the average level of the total sample enterprises; wherein, the average rate in South China and Southwest

[5] Zhang Xiaodong, "Analysis on the Comprehensive Effects of the Coordinated Development of Manufacturing and Logistics in China," document of the Third National Conference on the Coordinated Development of Manufacturing and Logistics, December 15, 2011.

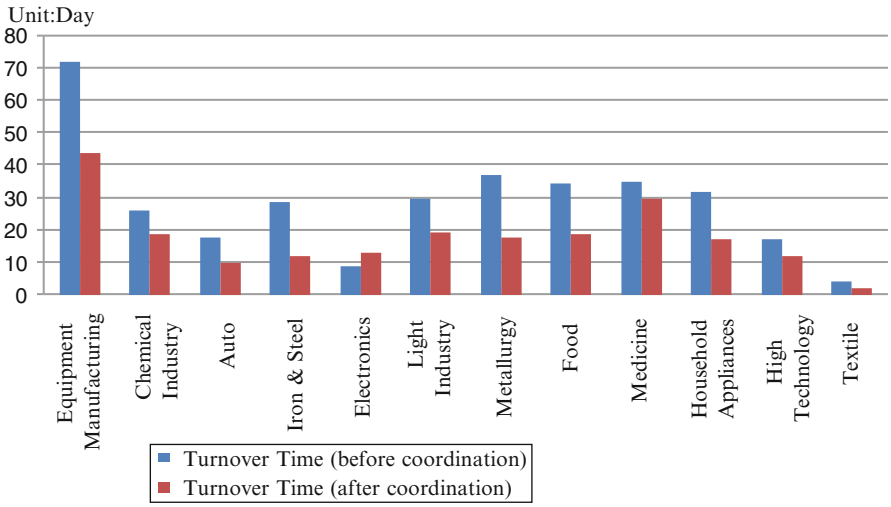

Fig. 12.4 Turnover time before and after the coordinated development in different industries (Source: *Logistics Data of Reporting Entities of National Demonstration Enterprises of the Coordinated Development,* published by the National Development and Reform Commission, March 2011)

China reached 99.4 %. Also the average rate in Northeast China and Northwest China was raised by 20.8 % and 10.3 % respectively, representing a remarkable improvement.

As for on-time delivery, that of the sample manufacturing enterprises reached 97.8 % after the coordinated development, increased by 10.2 % points compared with that before the coordinated development. Wherein, the average on-time delivery of sample manufacturing enterprises in the chemical industry, iron & steel, electronics, household appliances, high technology, and textile industries is higher than the average level of the overall sample. The on-time delivery of manufacturing enterprises in high technology field is the highest gainer, increased by about 20 % points, as shown in Fig. 12.5. From the regional prospective, the average on-time delivery of sample manufacturing enterprises in South China and East China is higher than the average level of the total sample, and that of the sample manufacturing enterprises in Northwest China has the most significant effects, increasing by 22 % points as compared with that before the coordinated development.

The damage rate of delivered goods for the sample manufacturing enterprises is reduced to 0.39 % after the coordinated development. Wherein, the damage rates in high technology, household appliances, medicine, food, metallurgy, iron & steel, auto and chemical industry are lower than the average level of the entire sample; manufacturing enterprises in high technology field have even realized zero damage rate, as shown in Fig. 12.6. From the perspective of regional distribution, the average damage rate of manufacturing enterprises in North China achieve the most reduction, dropping from 3 % to 0.28 %, and that in South China is reduced to 0.21 %, the lowest level among all regions.

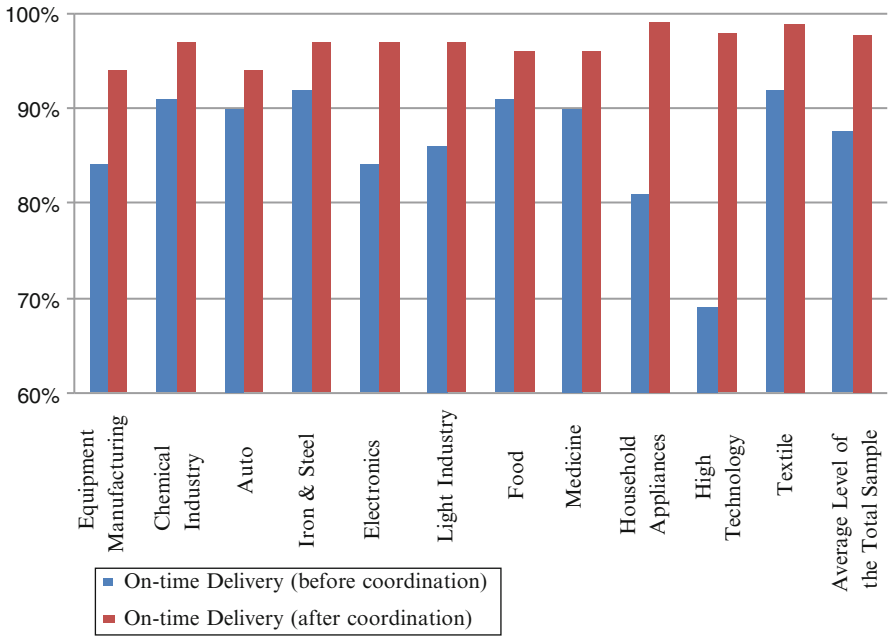

Fig. 12.5 On-time delivery before and after the coordinated development in different industries (Source: *Logistics Data of Reporting Entities for National Demonstration Enterprises of the Coordinated Development*, published by the National Development and Reform Commission, March 2011)

12.3.1.3 Remarkably Reduced Logistics Cost

Logistics cost is an important indicator which reflects the overall effect of the coordinated development. According to the data provided by the 261 reporting entities of the demonstration enterprises of the coordinated development,[6] the average annual logistics cost savings of 58.5 million RMB by the manufacturing enterprises in iron & steel industry is the largest. After the coordinated development, the average percentage cost reduction of the total sample manufacturing enterprises is 18.6 %; wherein, that of manufacturing enterprises in building material industry is the maximum, reaching 43 %, as shown in Fig 12.7.

[6] Zhang Xiaodong, "Analysis on Comprehensive Effects of the Coordinated Development of Manufacturing and Logistics in China," document of the Third National Conference on the Coordinated Development of Manufacturing and Logistics, December 15, 2011.

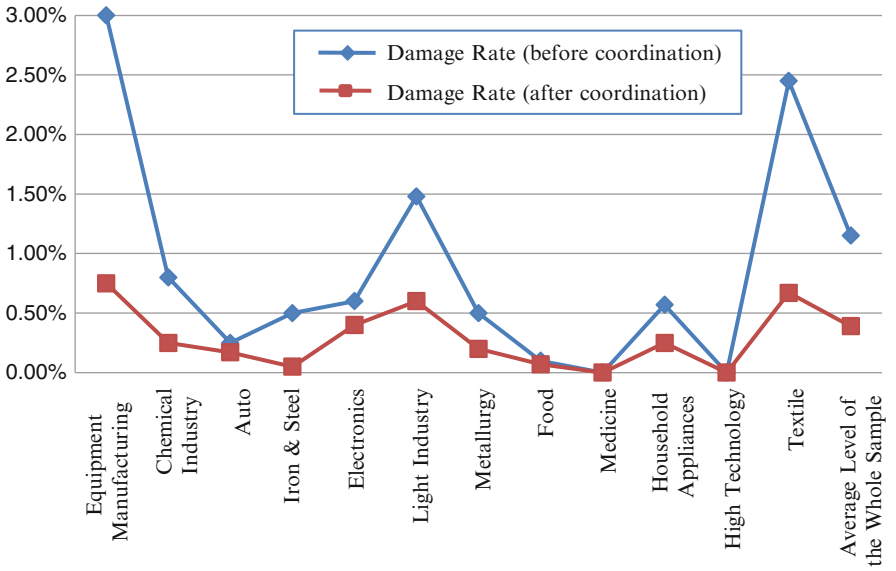

Fig. 12.6 Damage rate before and after the coordinated development in different industries (Source: *Logistics Data of Reporting Entities for National Demonstration Enterprises of the Coordinated Development*, published by the National Development and Reform Commission, March 2011)

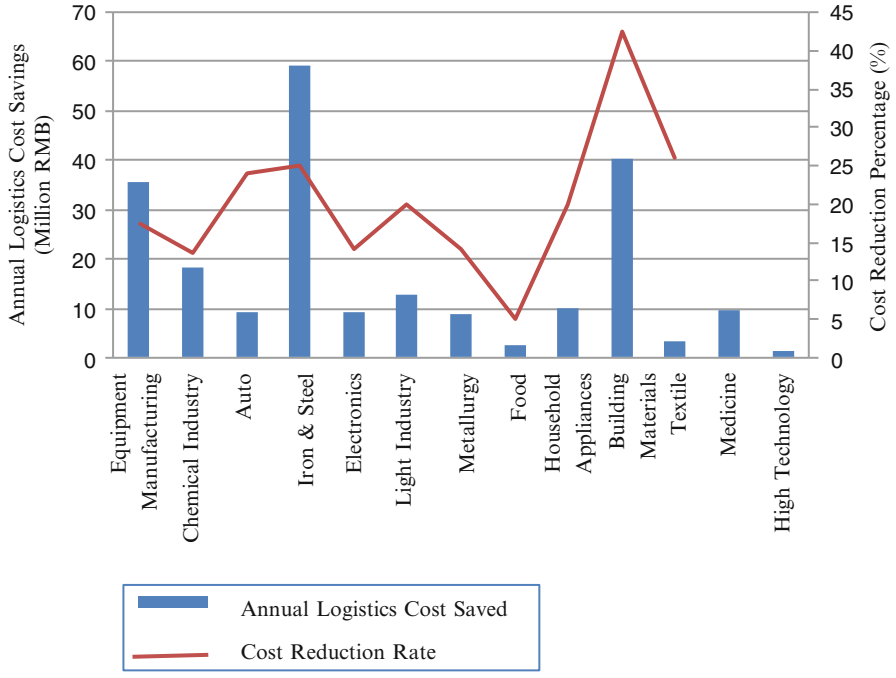

Fig. 12.7 Logistics cost saved after the coordinated development in different industries (Note: Data of cost reduction percentage for medicine and high technology industries are not available) (Source: *Logistics Data of Reporting Entities for National Demonstration Enterprises of the Coordinated Development,* published by the National Development and Reform Commission, March 2011)

12.3.1.4 Gradually Improved Informatization Level

According to the data provided by the 261 reporting entities of demonstration enterprises of the coordinated development,[7] the percentage of e-document management in all industries has improved; that in medicine, equipment manufacturing, metallurgy, electronics are notably enhanced. After the coordinated development, the percentage of e-document management in auto industry is the highest, reaching 98.4 %; that in chemical industry, electronics, light industry, household appliances, high technology, and textile are higher than the average level of the entire sample (91.8 %). Moreover, there is more than 95 % of the sample manufacturing enterprise in the Eastern region implemented e-document management. This is higher than the average level of the entire sample for all regions. Fig. 12.8 and 12.9 show the related data.

12.3.2 Main Problems in the Coordinated Development of Manufacturing and Logistics

12.3.2.1 Manufacturing Enterprises Need to Increase the Level of Logistics Outsourcing

The extent and level of the coordinated development depend largely on manufacturing firms releasing the logistics demand to logistics firms. Affected by the traditional operations style, many manufacturing firms still adhere to the "large and complete" or the "small yet complete" mode, resulting in high rate of self-operated and low level of socialized logistics. Insufficient influx of logistics business from manufacturing is a therefore a critical factor which hampers the coordinated development of manufacturing and logistics.

12.3.2.2 Logistics Enterprises Need to Improve the Service Level

Generally, logistics enterprises in China have recently achieved rapid development and the industrial scale has also been expanded continually. Yet they have the fundamental shortcomings of small scale, low level of specialization and low service capability. Most logistics enterprises can only provide singular transport and storage service but lack the ability to develop services with high

[7] Zhang Xiaodong, "Analysis on Comprehensive Effects of the Coordinated Development of Manufacturing and Logistics in China," document of the Third National Conference on the Coordinated Development of Manufacturing and Logistics, December 15, 2011.

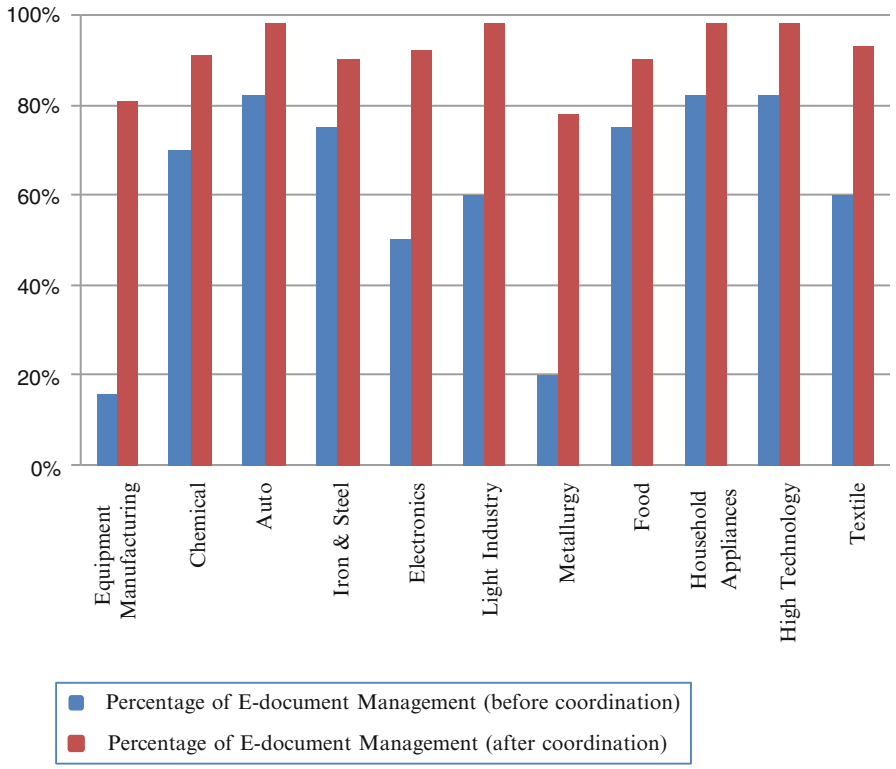

Fig. 12.8 Percentage of E-document management before and after the coordinated development in different industries

added value. Many manufacturing enterprises require highly specialized logistics, but few logistics firms can meet these corresponding demands; thus the inadequacy of the logistics enterprises hinders further development of the coordinated development.

12.3.2.3 Under-Regulated Logistics Market Affects the Coordinated Development

Logistics market in China is still in the development stage. The quality and professional service capability of many logistics enterprises are uneven under primitive operations and severe competition. Moreover, due to a lacking of adequate third party regulatory mechanism and a sound credit system for the logistics industry, manufacturing enterprises are often hesitant to release their logistics demand to external logistics firms, and thus limit the scope of coordinated development.

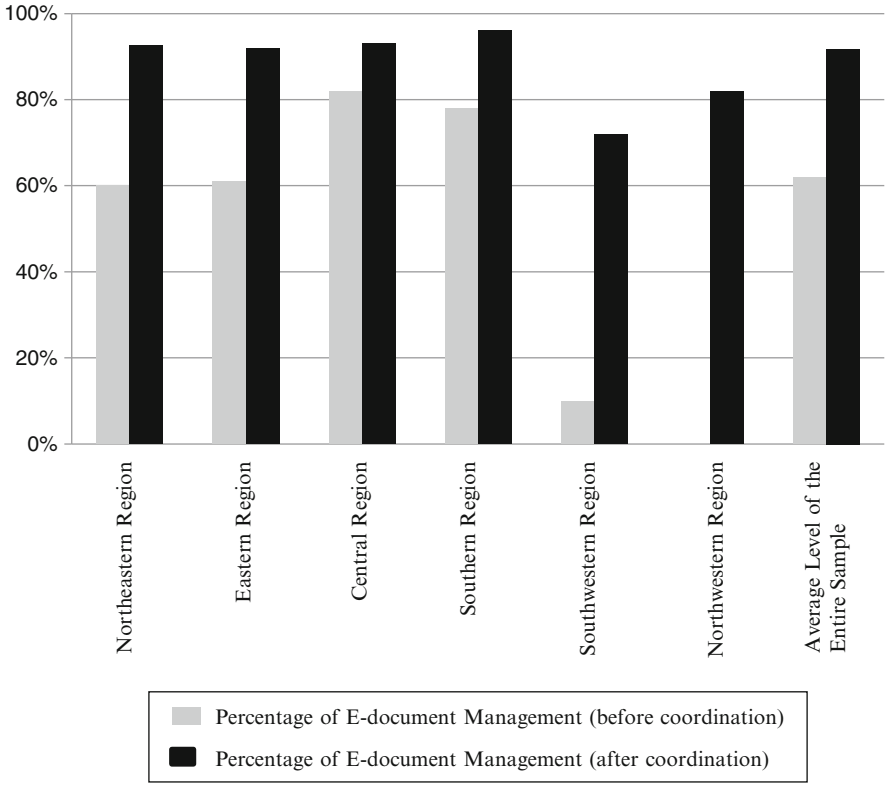

Fig. 12.9 Percentage of E-document management before and after the coordinated development in different regions (Source: *Logistics Data of Reporting Entities for National Demonstration Enterprises of the Coordinated Developmen*t, published by the National Development and Reform Commission, March 2011)

12.3.2.4 Systematic Obstacles Limit the Coordinated Development

Manufacturing enterprises are under the administration of the Ministry of Industry and Information Technology while a unified national department has not been instituted for the comprehensive management of the logistics enterprises. Fragmentation of administrative departments hinders the coordination, implementation and deepening of the policies for coordinated development. In addition, it is also advisable to strengthen the communications between industrial ministries and regional governments to break up the industrial and regional silos, and create a policy environment beneficial to industrial cooperation so as to further promote the coordinated development.

12.4 Trends and Suggestions for the Coordinated Development

Considerable achievements have been made in the coordinated development of manufacturing and logistics in China in recent years and the diversified development trend will likely continue in the future. This section will first make some observations on the development trend thus far and then attempt to present some suggestions for the steps in promoting the coordinated development.

12.4.1 Major Trends of the Coordinated Development

12.4.1.1 A Tendency of Elevating Toward High-End Form

At present stage, the coordinated development of manufacturing and logistics in China is still carried out at a low level in many respects. However, along with the spreading of the concept and the awareness on the subject, coordinated development will evolve from the simplistic logistics outsourcing toward higher-end forms such as logistics system detachment, logistics strategic alliances and complete transfer of logistics system. This will help transform the logistics enterprises from simple outsourcing firms into joint venture, stock-holding and independent logistics enterprises, as well as other high-end business forms.

12.4.1.2 A Tendency of Moving Toward Technology-Based Amalgamation with Other Industries

Along with the strengthening of logistics technology innovation, China will speed up its integration of logistics technology innovation with manufacturing. Both parties involved in the coordinated development will improve the degree of deeper integration between manufacturing enterprises and logistics enterprises by means of strengthening investment in special logistics technology assets.

12.4.1.3 A Tendency of Concerted Development

Presently, one-to-one development mode is the major form for the coordinated development. With the acceleration of industrial agglomeration and logistics clustering, the coordinated development will lean toward a more concerted development, which will be beneficial for promoting the coordinated development to develop toward scale, intensification and high efficiency.

12.4.2 Suggestions for Promoting the Coordinated Development

12.4.2.1 Promote the Coordinated Development to Develop Both in Scope and Depth

To further promote the coordinated development to advance in a healthy and swift manner, during the "12th Five-year Plan" period, emphasis will be placed on resolving the current problems and speeding up the promotion, innovation and clustering of the coordinated development. First of all, the promotion of the coordinated development in all industries will be sped up in diverse platforms including seminars, discussions and training sessions. Secondly, the innovation of coordinated development mode and market expansion will be supported, and a host of key enterprises and demonstration bases will be cultivated, relying on the advantageous enterprises, industry clustering areas and major projects. Thirdly, the coordinated development of manufacturing industry cluster and logistics industry cluster will be addressed by the layout optimization of industries during the opportune "12th Five-year Plan" period. The coordinated development demonstration area and public service platform are going to be established in the future.

12.4.2.2 Attentive to the New Mode and New Tendency of the Coordinated Development

For the current demonstration enterprises participating in the coordinated development, the "one-to-one" mode is most common, while "one-to-many" and "many-to-many" modes are rare. It is anticipated that more "one-to-many" and "many-to-many" development modes will appear gradually along with the clustering of manufacturing industries and the bunching of logistics industries. Relevant governmental ministries must be attentive to the new development tendency, and thoroughly study the new mode of coordinated development. It is necessary for government ministries to identify typical demonstration enterprises and coordinated development mode, and to put forward the supporting policies by innovation and guidance.

12.4.2.3 Learn from the International Experience of Coordinated Development

Manufacturing industry and modern logistics are complementary; support from modern logistics is indispensable to high level of development in manufacturing. Due to historical reasons, manufacturing in China has had weak technical foundation and poor overall innovation capability, and hence many industries are still well below the high bars of advanced nations. Many developed countries, such as Germany, the US and Japan, have exemplary cases in service mode design, logistics

technology application and process reengineering; these cases can serve as valuable references for China. For example, Audi AG of Germany collaborates with its logistics service provider on logistics service; both parties manage inventory of productive spare parts effectively through advanced video monitoring technology and warehouse management technology. So for China, it is essential to not only study the coordinated development mode of Chinese enterprises under realistic conditions, but also borrow ideas from the advanced experience and successful mode of developed countries, so as to promote industrial transformation and upgrading as well as change the economic development mode in China.

12.5 Summary

This chapter presents the current status of the coordinated development of manufacturing and logistics in China, describes the typical mode of the coordinated development, analyzes the corresponding implementation results and existing problems, and finally discusses the trend and offers some suggestions on the coordinated development. As for the development status, relevant State ministries successively issued various policies to guide and regulate the coordinated development, local governments and associations actively promoted the concept of coordinated development, and numerous manufacturing and logistics enterprises participated in the government-supported coordinated development demonstration project. In terms of development mode, both the manufacturing and logistics firms involved in the coordinated development adopted the milk run, the vendor-managed inventory, the just-in-time production and other supply chain management ideas and created many new cooperation modes. Viewed from the effects of coordination, both sides involved achieved favorable results in terms of logistics operations efficiency, logistics service quality, logistics cost and informatization management. Yet there still exist some problems along the development path. To achieve further advancement, it is essential to accelerate the implementation of the enacted policies regarding the coordinated development, grasp the new development modes and trends, and learn from the experience of the leading nations in the world.

Chapter 13
Development of Cross-Border Logistics System in Inland China

Jun Liu

In recent years, with the rapidly increasing economic and trade exchange between China and its continental neighboring countries, inland cross-border logistics system plays a more and more important role in China's economic development. Inland border area of China is witnessing rapid development of international logistics market. Under the substantial support of national policies and the stimulation of increasing demands, the construction of infrastructure like logistics nodes and channels in inland border area of China is being strengthened, and the operational mode of cross-border logistics is becoming more mature.

This chapter includes three sections. The first section introduces the development background of cross-border logistics system in inland China. The second section briefly describes the main logistics nodes and channels in inland border area of China. The third section focuses on the operation of cross-border logistics system in inland China.

13.1 Development Background of Cross-Border Logistics in Inland China

With the deepening of reform and opening-up, the economic cooperation between China and inland border countries is being strengthened, and the inland border area is becoming more open to the outside. The significance of establishing a smooth and efficient cross-border logistics system for the economic development of inland border area is becoming more apparent.

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Fig. 13.1 Map of border provinces in Inland China and continental neighboring countries

13.1.1 Basic Conditions of Border Provinces in Inland China and Continental Neighboring Countries

The total length of China's land border is about 22,000 km, with 9 provinces bordering 14 neighboring countries. The 9 provinces are respectively: Heilongjiang Province, Jilin Province and Liaoning Province in the northeast border, Inner Mongolia Autonomous Region extending from the Northeast Region in the north to the Northwest Region, Gansu Province and Xinjiang Uygur Autonomous Region in the northwest border, as well as the Tibet Autonomous Region, Yunnan Province and Guangxi Zhuang Autonomous Region in the southwest border. China borders Russia, North Korea and Mongolia in the Northeast Region, some Central Asian countries such as Kazakhstan, Kyrgyzstan and Tajikistan in the Northwest Region, and some Southeast Asian countries such as Vietnam, Myanmar, etc. in the Southwest Region. Figure 13.1 shows the detail.

Due to transportation, location, history and other reasons, the economic development of these nine inland border provinces is comparatively backward. The economic development level of other neighboring countries except Russia and Kazakhstan in the 14 continental neighboring countries is comparatively low as well.

13.1.2 Economic and Trade Exchange Between China and Its Continental Neighboring Countries

13.1.2.1 Highly-Complementary Economy

The economy of China and that of its continental neighboring countries are highly complementary. In terms of the major types of imported and exported goods, China mainly imports raw materials, fuel and other primary products from neighboring countries while exporting machinery, transporting equipments and other industrial manufactured products. In 2010, labor-intensive and capital-and-technology-intensive industrial manufactured products accounted for nearly 93.8 % of the total export volume; while the general primary products imported in the same period accounted for 70.7 % of import volume, as shown in Fig. 13.2.

Ever-Growing Annual Import and Export Volume

In recent years, the import and export volume between China and its continental neighboring countries is growing year by year. From 2006 to 2010, the import and export volume between China and its continental neighboring countries increased from 87.13 billion USD to 196.05 billion USD, with the average annual growth rate being 25.0 %. Table 13.1 shows the import and export status between China and its neighboring countries for 2006–2010.

In recent years, the growth rate of import and export volume between China and its continental neighboring countries is higher than that between China and the major developed countries, and it is also higher than that of the total volume of China's import and export. With the ever-growing total volume, the proportion of import and export volume between China and its continental neighboring countries in China's total import and export volume increased from 4.95 % in 2006 to 6.59 % in 2010, as shown in Fig. 13.3.

13.1.2.2 Rapidly-Increasing Cross-Border Logistics Demand

Since 2000, the Chinese Government successively introduced several strategic plans for regional development, including the "Westward Development," the "Revitalization of the Old Industrial Base in Northeast China," the "Changchun-Jilin-Tumen River Pilot Zone," the "Beibu Gulf Development," so as to accelerate the economic

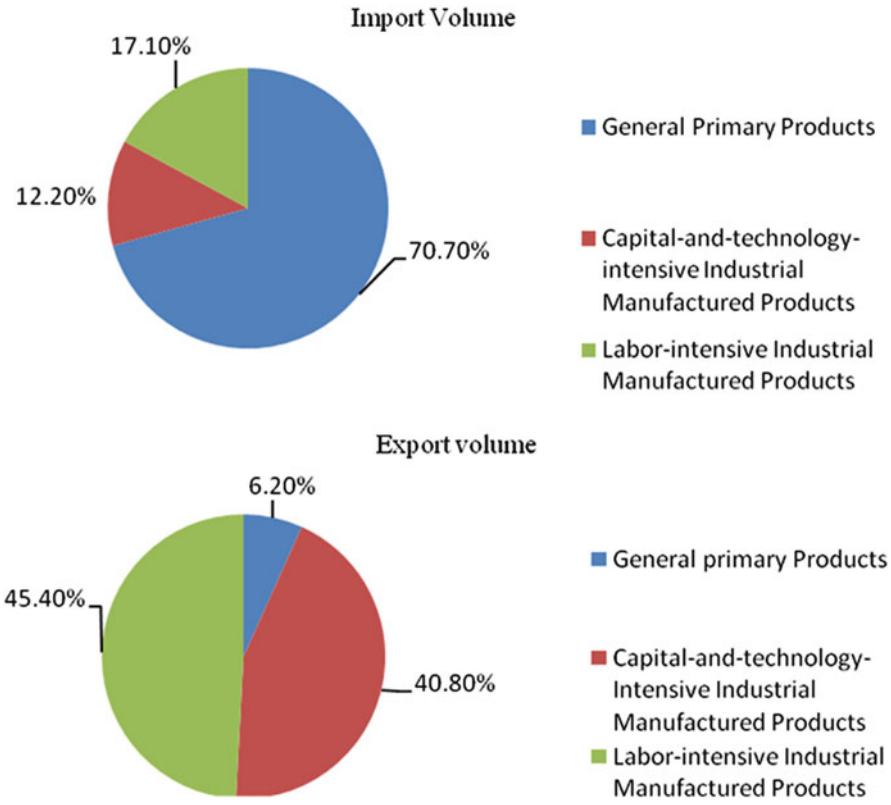

Fig. 13.2 Categories of imported and exported goods between China and Its continental neighboring countries (Source: Compiled from database in UN Comtrade)

development of inland and border area. Since the economy of China is highly complementary with that of the continental neighboring countries, many provincial and municipal governments have put forward the development thinking of "opening to the west and entering into international market through land route."

"Opening to the west" of the Central and Western Region of China generates a large demand for land cross-border logistics, which enables the foreign trade volume via China's major inland ports to increase rapidly. From 2006 to 2011, the average annual growth rate of the import and export volume through the customs of China's major inland ports reached 24 %, as shown in Table 13.2 and Fig. 13.4.

13.1.3 Body for Planning and Construction of Inland Cross-Border Logistics System

The Chinese Central Government attaches great importance to the planning and construction of logistics infrastructure in the inland border area. The State Council issued *the Adjustment and Development Plan of Logistics Industry* in 2009, and

Table 13.1 Import and export status between China and its neighboring countries for 2006–2010 (Unit: Billion USD)

	2006		2007		2008		2009		2010	
Country (region)	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import
Afghanistan	0.10	0.00	0.17	0.00	0.15	0.00	0.21	0.00	0.18	0.00
The Kingdom of Bhutan*	161	0.00	5,393	0.00	8,463	0.00	4,116	52	1,586	13
Myanmar	1.21	0.25	1.70	0.38	1.98	0.65	2.25	0.65	3.48	0.97
North Korea	1.23	0.47	1.39	0.58	2.03	0.76	1.89	0.79	2.28	1.19
India	14.58	10.28	24.01	14.62	31.59	20.26	29.66	13.73	40.91	20.85
Laos	0.17	0.05	0.18	0.09	0.27	0.13	0.38	0.37	0.48	0.60
Mongolia	0.43	1.15	0.68	1.35	0.91	1.53	1.07	1.36	1.45	2.55
Nepal	0.26	0.01	0.39	0.01	0.38	0.01	0.41	0.01	0.73	0.01
Pakistan	4.24	1.01	5.79	1.10	6.05	1.01	5.53	1.26	6.94	1.73
Vietnam	7.46	2.49	11.89	3.23	15.12	4.34	16.30	4.75	23.10	6.98
Kazakhstan	4.75	3.61	7.45	6.43	9.82	7.73	7.83	6.30	9.32	11.13
Kyrgyzstan	—	—	—	—	—	—	5.28	0.05	4.13	0.07
Tajikistan	—	—	—	—	—	—	1.22	0.19	1.38	0.06
Russia	15.83	17.55	28.47	19.69	33.08	23.83	17.52	21.23	29.61	25.92
Total	50.27	36.86	82.12	47.48	101.4	60.24	89.55	50.68	123.98	72.07

Note1: the unit of the items marked with* is thousand USD
Note2: Data with decimal points are rounded to two decimal digits; "0.00" means value less than 0.005; "—" in the table indicates missing data
Source: Compiled from related data in the *China Statistical Yearbook* (2007–2011)

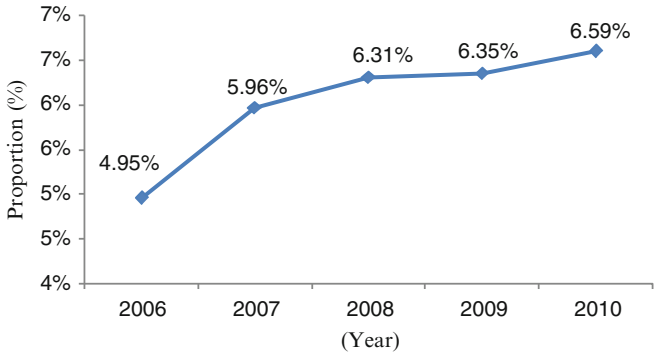

Fig. 13.3 Proportion of import and export volume between China and its continental neighboring countries in China's total import and export volume for 2006–2010 (Source: Compiled from related data in the *China Statistical Yearbook* (2007–2011))

made corresponding planning of logistics hub in central cities on cross-border logistics collection/distribution, and transit functions and on cross-border connection among channels. The NDRC (National Development and Reform Committee), the Ministry of Railways, the Ministry of Transport and other departments issued multiple documents, and put forward the contents such as constructing a comprehensive transport system to promote globalization, and promoting the development

Table 13.2 Total volume of imported and exported goods through the customs of China's major land ports for 2006–2011 (Unit: billion USD)

		Hohhot	Manzhouli	Nanning	Shenzhen	Urumchi
2006	Export	0.48	0.59	3.04	174.44	7.59
	Import	2.34	6.21	4.92	119.50	3.46
2007	Export	0.67	1.16	4.72	217.13	12.28
	Import	2.25	7.57	7.06	141.79	6.08
2008	Export	0.89	1.31	7.29	238.56	22.23
	Import	2.69	9.62	9.57	153.27	7.59
2009	Export	0.95	0.67	6.49	216.87	15.73
	Import	2.49	6.18	8.87	135.73	6.28
2010	Export	1.40	0.87	9.91	286.03	15.87
	Import	3.82	8.94	11.74	189.51	11.72
2011	Export	2.24	1.38	14.00	366.49	17.76
	Import	5.22	5.07	18.85	246.69	19.39

Source: Compiled from customs statistics published on the website of the general administration of customs of the People's Republic of China

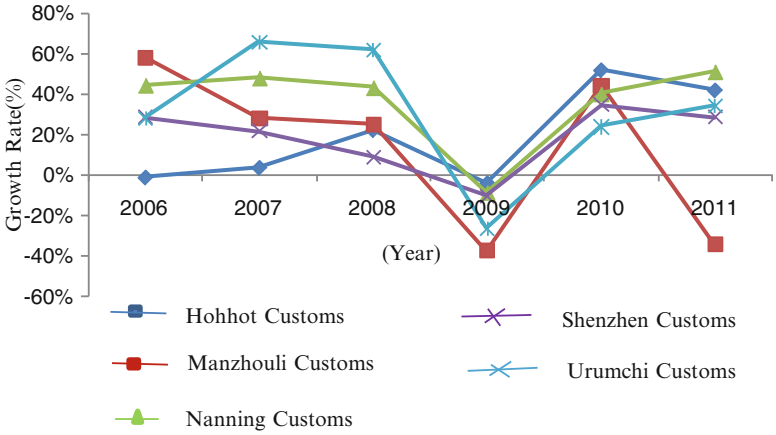

Fig. 13.4 Growth rate of total import and export volume Through the customs of China's major land ports for 2006–2011 (Source: Compiled from customs statistics published on the website of the general administration of customs of the People's Republic of China)

of multimodal transport. These documents include: *China's Medium and Long-term Railway Development Plan*, the *Twelfth-Five Year Plan on Highway and Water Transport,* the *Cooperative Agreement on Jointly Promoting Railway and Water Multimodal Transport Development Issued by the Ministry of Railway Transport* and the *Guidance on Accelerating Railway and Water Multimodal Transport Development.* The Ministry of Foreign Affairs, the Ministry of Commerce, the General Administration of Customs, and other departments of the Central Government also made concerted efforts to actively coordinate the work in international relations, commercial policy, customs clearance mode and other aspects.

The local governments in inland border area have actively promoted the construction of cross-border logistics system, so as to improve the international competitiveness of regional economy and strengthen the development of export-oriented economy. Driven by market demands, many enterprises actively participate in the construction of cross-border logistics system. Some relatively stronger enterprises engaging in foreign trade, international logistics and international multimodal transport have become important carriers in constructing and directly implementing cross-border logistics project operations.

13.2 Major Nodes and Channels of Cross-Border Logistics System in Inland China

Cross-border logistics system needs to be supported by well-developed infrastructure. Due to different national conditions and unbalanced development levels of China's inland border countries, the construction of cross-border logistics nodes and channels between different regions of China (the Northeast, the Northwest and the Southwest) and these countries varies greatly. The Central and local governments are actively cooperating with relevant countries to accelerate the construction of cross-border logistics infrastructure.

13.2.1 Major Ports in Inland Border Area of China

13.2.1.1 Major Ports in Inland Border Area

In 1984, the Central Government authorized 14 eastern coastal cities to open to the outside world, and then it authorized another 13 inland border cities to open to the outside world in 1992.[1] A pattern of "two-way opening up of land and sea" is gradually formed in China. Up to the present, the number of first-class ports[2] open to the outside authorized by the Central Government reaches 284 in number, in which, 146 are in the coastal area, 111 are in the border area and 27 are inland. In addition, there are also some second-class ports[3] authorized by the local governments in the inland border area.

[1] The 13 border "open cities" include: Heihe City and Suifenhe City in Heilongjiang Province, Huichun City in Jilin Province, Manzhouli City and Erenhot City in Inner Mongolia Autonomous Region, Yining City, Tacheng City and Bole City in Xinjiang Uygur Autonomous Region, Ruili City, Wanding City and Hekou City in Yunnan Province and Pingxiang City and Dongxing County in Guangxi Zhuang Autonomous Region.

[2] First-class ports refer to sea (river), land and air passenger and cargo ports where Chinese and foreign personnel, cargos, articles and vehicles are allowed to enter and exit the country (customs and border).

Table 13.3 Major open ports in Inland border area of China

Province	Railway ports	Highway ports	Water ports
Heilongjiang	Suifenhe	Suifenhe, Dongning and Mishan	Mohe, Tongjiang, Heihe, Huma, Xunke, Fuyuan, Hulin, Luobei, Jiayin, Raohe and Sunwu
Jilin	Ji'an, Tumen and Huichun	Huichun, Linjiang, Kaishantun, Guchengli, Sanhe, Nanping, Changbai, and Quanhe	
Liaoning	Dandong		
Inner Mongolia	Erenhot and Manzhouli	Erenhot, Manzhouli, Arihasate,Huengadabuqi, Ganqimaodao and Ceke	Heishantou and Shiwei
Xinjiang	Alataw Pass and Horgos	Khunjerab, Korgas, Timbuktu, Erkeshtam, Jeminay, Torugart, Laoyemiao, Hongshanzui, Yarant, Dulata, Wulasitai, Muzart, Aheitubieke and Karasu	
Tibet		Zhangmu, Pulan and Jilong	
Yunnan	Hekou	Ruili, Daluo, Mohan, Tianyou, Jinshuihe, Wanding and Tengchonghouqiao	Jinghong
Guangxi	Pingxiang	Pingxiang, Youyiguan, Dongxing and Longbang	

Source: Compiled from the port map of the China Association of Port-of-Entry (http://www.caop.org.cn/map_site/map.htm)

The ports in inland border area are distributed among nine border provinces, forming a ribbon-shaped border port system, which surrounds nearly the entire Northeast, Northwest and Southwest border area of China. The opening status of the major ports in inland border area of China is shown in Table 13.3.

Major ports in the Northeast Region of China include Suifenhe, Huichun and Dandong; the foreign trade activities through which are mainly oriented to Russia, Mongolia and North Korea. Major ports in Inner Mongolia Autonomous Region include Manzhouli, Erenhot, Ganqimaodu, and Ceke; the foreign trade activities through which are mainly oriented to Mongolia and Russia. Major ports in the Northwest Region include Alataw Pass and Korgas; the foreign trade activities through which are mainly oriented to Kazakhstan, Tajikistan and other Central Asian countries. Major ports of Tibet, Yunnan and Guangxi in the Southwest Region include Zhangmu, Ruili, Pingxiang, and Youyiguan; the foreign trade activities through which are mainly oriented to the ASEAN's ten member states, Nepal and other South Asian countries.

13.2.1.2 Logistics System of Inland Border Ports

Logistics system of ports in different regions varies greatly, mainly resulted from multiple neighboring countries, various topographies and the coexistence of multiple transportation means. In terms of distribution, ports in Inner Mongolia, Xinjiang and Tibet are comparatively scattered, and those in the three provinces in Northeast Region, Yunnan and Guangxi are comparatively concentrated. In terms of transportation means, the Northeast and Northwest Region are mainly highway and railway, and the land bridge becomes an important channel of cross-border logistics. Topography in the Southwest Region is complex, and the transportation is dominated by highway and inland waterway.

Functionally, great progress has been made in infrastructure construction of port logistics in China during recent years. Port areas have successively accelerated the construction of cross-border logistics system and actively developed modern transportation means and third-party logistics, constructed large logistics hubs, and built national, regional and border logistics centers. The function of port logistics parks is gradually expanded from simple transportation and field warehousing to international transit, international distribution, commodity sales and exhibition, and import and export processing. Reforming and improving the facilities and functions of the original ports and solving the connection between port logistics system and domestic logistics system are important contents of hardware construction of border ports at present.

13.2.1.3 Future Development of Cross-Border Logistics System in China

Generally, the cross-border logistics system in China in the future will mainly serve the following objectives: (1) Open to the north, deepen the economic and trade cooperation and technological exchange between Inner Mongolia and Russia, Mongolia and other countries, and leverage its functions as a hub in providing domestic guidance and foreign connection; (2) Open to the west by taking Xinjiang as the portal, so as to deepen the cooperation between Xinjiang and the countries in Central Asia, West Asia, South Asia and Europe, and accelerate the construction of the grand logistics channel between Xinjiang and the neighboring countries; (3) Strengthen the cooperation with the ASEAN countries by setting up Guangxi as the core, establish and improve the cooperative platform with the ASEAN, so as to enable Guangxi to play a more significant role in China-ASEAN FTA; (4) Deepen the cooperation with the Great Mekong Sub-region, strengthen the cooperation between Yunnan and the countries in Southeast Asia and South Asia as well as the countries around the Indian Ocean, and construct the strategic access to sea in Southwest.

13.2.2 Major Logistics Nodes and Channels in the Northeast Border Area

Major logistics nodes in China's Northeast border area include Manzhouli,[3] Suifenhe, and Huichun ports. The connection between Manzhouli exit and the Eurasia Continental Bridge[4] via the Trans-Siberian Railway is the traditional passage of cross-border logistics in the Northwest Region. Cross-border land-ocean combined transport channel, with the ports in Russia and North Korea being the exits, has already been opened in the Northeast Region of China. China-Russia crude oil pipeline entering from Mohe port in Heilongjiang Province is one of the four major passages for oil import of China.

13.2.2.1 Logistics Nodes

- Manzhouli

Manzhouli is located in the northeast part of Inner Mongolia Autonomous Region. Bordering Russia and Mongolia, it is the largest land port in China's border area. Manzhouli is an important hub on Eurasia grand land channel, which undertakes over 70 % of the land transport of China-Russia trade. On the grand channel from the ports in Pan Bohai Area of China to Russian and European countries, Manzhouli port is a quite important logistics node. At present, trade, finance, transportation, warehousing and other industries are fully developed in Manzhouli, and the comprehensive port transportation system is gradually being improved.

The railway port of Manzhouli is equipped with the warehousing, transfer, and reloading functions, with the comprehensive reloading capacity reaching 30 million tons, and ranking first among the border ports of China. The annual traffic capacity of the highway port in Manzhouli has reached 6 million tons; the highway port logistics park is connected with the port through closed special channel, so that customs and quarantine inspections can be carried out in the logistics park.

- Suifenhe

Suifenhe is in the southeast of Heilongjiang Province and borders Russia. It is 210 km away from Vladivostok, the largest port city in the far east of Russia, and 270 km away from Nahodka, the free economic zone in the far east of Russia.

[3] Manzhouli port is administratively attached to Inner Mongolia Autonomous Region in northern China, but it is closer to the Northeast Region in terms of geographical location and economic connection, therefore, it will be introduced together with the northeastern border ports.

[4] Eurasia Continental Bridge is also called Siberian Land Bridge, which starts from Khabarovsk (Boli) and Vladivostok (Haishenwai) in eastern Russia, crosses European countries via Trans-Siberian Railway and terminates at Rotterdam Port in the Netherlands. It passes through seven countries, including Russia, China, Kazakhstan, White Russia, Poland, Germany and the Netherlands, with the total length being 13,000 km.

Suifenhe connects with Russia via railway and highway, and can reach Japan, South Korea and other countries through Russia's ports.

The Suifenhe Comprehensive Bonded Zone was established in April of 2009, which is the only Comprehensive Bonded Zone in the China-Russia border area. Endowed with the functions of international transfer, international distribution, international purchase, transit trade, commodity sales and exhibition, and import and export processing, Suifenhe Comprehensive Bonded Zone is one of the areas under special customs supervision, featuring the highest opening level, enjoying the most favorable policies and possessing the fullest functions in China.

- Huichun

Huichun lies in the southeast of Jilin Province and in the border area of China, North Korea and Russia. It is China's only costal city bordering the Sea of Japan, and also the nearest point from China to the east coast of South Korea, west coast of Japan and even North America and North Europe through water route. Huichun is an important comprehensive traffic hub city in the Northeast Asia, possessing three first-class national ports and one second-class port; in which, Changlingzi Highway Port and Huichun China-Russia International Railway Port are linked with Russia. Quanhe port and Shatuozi port border North Korea along Tumen River, and across from Quanhe port is Rajin of North Korea, the pilot free economic and trade zone.

13.2.2.2 Logistics Channel

The Eurasia Continental Bridge is the most important channel for the economic and trade linkage between China and Russia. At present, cross-border trains connecting the Eurasia Continental Bridge via Manzhouli have been launched in the Port of Dalian and the Port of Tianjin. The new cross-border channels in the Northeast Region are mainly: cross-border land-ocean combined transport channel for domestic trade goods and international transportation channel along Tumen River.

- Land-ocean combined transport channel involving the ports in Russia and North Korea

The northeast inland area is close to the ports in the far east of Russia and North Korea. Domestic trade goods in the Northeast Region can exit to sea by way of ports of Vladivostok in Russia and Rajin in North Korea, and then be transferred to ports in southeast coastal cities of China, such as Shanghai, and Ningbo. This path avoids the congestion of domestic transportation channels in China, and draws the Northeast Region closer to southeast coastal area geographically. Ocean combined transport between the Northeast Region in China and the Yangtze River Delta Region can be achieved through this fast channel, which is 1,000 km shorter than the domestic land route.

- International transport channel along Tumen River

Tumen River is in the southeast border of Jilin Province, and it is the boundary river between Mainland China and North Korea; the lower reaches of which is the

boundary river between North Korea and Russia. Tumen River is the only water channel from China to the Sea of Japan through land route. In the regional cooperation of the Northeast Asia, the international transport channel along Tumen River is an important international transport corridor in the Northeast Asia.

Local governments of China, Japan, Russia, Mongolia and South Korea[5] are making joint efforts to solve the problems on the shortage of logistics and passenger flow, complex formalities, and impeded customs clearance along the current route and channel, seeking to form a regional channel network soon. In June of 2011, the project of Rason Economic and Trade Zone in North Korea, jointly built and managed by China and North Korea, had started construction, so was the improvement project of the highway from Port of Quanhe to Port of Rajin along Port of Yuanting. In August 2011, trial run of Huichun-Kameishaowaya (Huichun of China and Kameishaowaya of Russia) Railway and land-ocean combined transport route were launched, and the supporting project of 10-million-ton international transshipment station also began construction, and the land-ocean combined transport route in Tumen River area along Huichun-Zarubino-Fushan and Huichun-Zarubino-Xinxie was also officially launched.

13.2.3 Major Logistics Nodes and Channels in Inner Mongolia Boreder Area

Major logistics nodes in the Inner Mongolia border area include Manzhouli, Erenhot, Ganqimaodou, and Ceke. Manzhouli is the most important logistics node for China to conduct economic and trade activities with Russia; Erenhot is the most important logistics node between China and Mongolia; Ganqimaodu and Ceke are important nodes on China-Mongolia coal channel.[6]

13.2.3.1 Logistics Nodes

- Erenhot

Erenhot lies in central Inner Mongolia Autonomous Region, and is the most important collecting and distributing center of imported and exported commodities in the economic and trade exchange between China and Mongolia. The Port of Erenhot is also an important node for China to carry out border trade and processing trade with Mongolia, Russia and countries in Eastern Europe.

[5] Jilin Province, Tottori Prefecture of Japan, Kangwon Province of South Korea, Central Province of Mongolia and Primorskiy Kray of Russia.

[6] Commodities handled through the ports of Ganqimaodu and Ceke are comparatively of single variety, with coal being the major commodity type, so they will not be discussed in detail.

In terms of railway, Port of Erenhot is the only railway port bordering China and Mongolia; domestically it connects to the Port of Tianjin, and internationally links to the railway network of all European countries via Ulan Bator and Moscow. Port of Erenhot has the largest bulk loading yard and wheel-changing station in Asia, and possesses many functions including warehousing, transferring, and reloading. Presently, it has an annual handling capacity of 10 million tons.

Via highway, Erenhot can reach Beijing in 6 h. At highway freight port in Erenhot, passenger and cargo transportation has already been separated, and customs clearance inspection, warehousing and transportation and living services have been successfully integrated. The annual cargo-handling capacity reaches 10 million tons and the annul passenger capacity reaches two million.

13.2.3.2 Logistics Channels

- Ocean-railway combined transport channel between China and Mongolia

The ocean-railway combined transport channel between China and Mongolia starts from Tianjin and Beijing, enters Mongolia through Erenhot, and connects the Eurasia Continental Bridge after arriving at Moscow via Ulan Bator. This channel is the nearest land route from Beijing to these regions, and the route from Beijing to Moscow via Erenhot is 1,140 km shorter than via Manzhouli. This channel is also the most convenient land route for Japan and South Korea to connect with these regions, and more importantly, it is the only channel for transporting the goods of Mongolia through waterway.

At present, this channel is the busiest channel for the economic and trade exchange between Mongolia and China; it undertakes over 70 % of the China-Russia trade volume. The exported cargos through Erenhot are mainly building materials and light industrial products, while the imported cargos are mainly crude oil, timber, ore, coal and other minerals.

- Western Inner Mongolia coal-import channel

Ganqimaodu and Ceke are China-Mongolia bilateral open ports in western Inner Mongolia Autonomous Region. With the sharp increase of coal imported from Mongolia in China, coal-transportation channel is opened at both ports. In 2011, for both ports, throughput exceeded 10 million tons, and the import volume of coal accounted for over 90 % of the throughput.

Highway transportation is the chief means of coal import of both ports at present, but it is far from meeting the demands. Both ports have already formulated long-term development planning for port logistics. By 2011, the special railway for coal transportation at Port of Ceke was open to traffic, and the track of the railway to Ganqimaodu has already been laid to the port.

13.2.4 Major Logistics Nodes and Channels in the Northwest Border Area

The Northwest Region plays an important role in economic and trade exchange between China and the Central Asia, West Asia, Russia and other regions. Multiple trade and logistics nodes having international logistics functions have been formed in the region, typified by Alataw Pass and Korgas. The New Eurasia Continental Bridge is the most important cross-border logistics channel in the Northwest Region, and northwest border ports are also crucial channels for China to import oil and natural gas of the Central Asia.

13.2.4.1 Logistics Nodes

Among the 18 national first-class border ports in the Northwest Region, Alataw Pass and Korgas are the most prominent ones.

- Alataw Pass

Alataw Pass lies in Bortala Mongol Autonomous Prefecture of Xinjiang Province and borders Kazakhstan; it is the west bridgehead of the New Eurasia Continental Bridge[7] in China, and also a national first-class port merging railway, highway and oil pipeline. At present, the port has already been built into the largest indoor container reloading storehouse in Asia, capable of 24-h reloading, and with the annual reloading capacity of 200,000 TEUs. The port is currently evolving from a simple throughput channel into a modern logistics center of import and export trade and processing trade, combining transfer, collecting, distributing and processing together.

- Korgas

Korgas, lying in the Ili Kazak Autonomous Prefecture of Xinjiang Province and bordering Kazakhstan, is the largest highway port in the Northwest Region of China. With the construction of west-east natural gas pipeline and the connection of China-Kazakhstan Railway, the port becomes another international logistics node in western China linking railway, highway and pipeline transport together. The project of China- Kazakhstan Korgas International Border Cooperation Center began its construction in 2007and is the first cross-border economic and trade zone in China. The center is located in the adjacent area on both sides of the China-Kazakhstan border and lends solid support to the development of the Port of Korgas. It implements a closed-type of management, and possesses diverse functions such as trade negotiation, commodity exhibition and sales, warehousing and transportation, bonding, financial service, and hosting international economic and trade conference.

[7] The New Eurasia Continental Bridge, as opposed to the Siberia Eurasia Continental Bridge, starts from Lianyungang in Jiangsu of China in the east, exits China from Alataw Pass in Xinjiang, and terminates at the Port of Rotterdam in the Netherlands.

Fig. 13.5 Map of the new Eurasia continental bridge

13.2.4.2 Logistics Channels

- The New Eurasia Continental Bridge

Compared with the Eurasia Continental Bridge through Siberia, the New Eurasia Continental Bridge enjoys the obvious advantages of year-round operation, shorter transport distance, and wider radiating area. The channel is composed of Longhai Railway and Lanxin Railway in China, and crosses over six provinces, including Jiangsu, Anhui, Henan, Shaanxi, Gansu and Xinjiang Internationally, it passes through seven countries, including China, Kazakhstan, Russia, White Russia, Poland, Germany and the Netherlands, with a total length of 10,800 km, as shown in Fig. 13.5.

The New Eurasia Continental Bridge affords a complementary function to the economy of the countries along it. Through opening the area along the Bridge, China and countries in the Central Asia and Europe can better attract international capitals, technologies and managerial experiences, so as to accelerate their economic development. With rapid growth of the economy in the Asia-Pacific Region, the two-way interaction between the economy of the Asia-Pacific Region and that of Europe becomes more evident. The New Eurasia Continental Bridge provides a

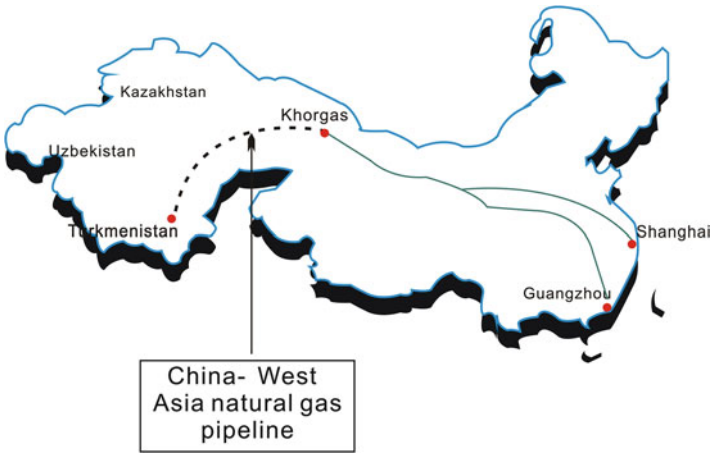

Fig. 13.6 Map of central Asia gas pipeline

convenient channel for the economic and trade exchanges among the countries along the bridge as well as between Asia and Europe, which has great significance in promoting the continental economic corridor and expanding the economic and trade cooperation between the Asia-Pacific Region and Europe.

- Central Asia gas pipeline and China-Kazakhstan oil pipeline

Central Asia gas pipeline is the first transnational energy channel for China to usher in gas resource from other countries. The channel starts from the border of Turkmenistan and Uzbekistan in the west, runs through central Uzbekistan and southern Kazakhstan, and connects to the second West-East Gas Transmission line after entering China through Korgas in Xinjiang. It arrives at Shanghai in the east and Guangzhou in the south after running through Xinjiang, Hubei, Zhejiang and other provinces, and finally terminates at Hong Kong, as shown in Fig. 13.6. With the total length of 10,000 km, it is the longest gas pipeline in the world.

China-Kazakhstan oil pipeline is the first oil pipeline of China's energy source from Central Asia. The pipeline originates from Atasu of Kazakhstan in the west and enters China through the Port of Alataw Pass at the border between China and Kazakhstan. The designed annual oil-transmission capacity of Phase I pipeline is 20 million tons, which was put into operation in July of 2006; Phase II pipeline has already been marked as a key project of oil and gas pipeline network in the "Twelfth Five-Year Plan" of the Westward Development.

13.2.5 Major Logistics Nodes and Channels in the Southwest Border Area

Mountains and rivers sprawl over the border area in the Southwest Region of China. Transportation in the area is generally inconvenient, and predominantly by highway

and inland water transport, except for the railway between China and Vietnam. Among the major logistics nodes, Zhangmu is an important port for the economic and trade exchange between Tibet Autonomous Region and Nepal, Ruili is the most important highway port of Yunnan Province, while Pingxiang is an important railway port at the border of China and Vietnam.

13.2.5.1 Logistics Nodes

- Ruili

Ruili lies at the junction of the Burma Road in western Yunnan Province and Ledo Road. It was an important channel of the Silk Road in southern China from ancient times, and is presently an international land transportation hub in southwestern China. . Both the China-Myanmar land-ocean combined transport channel and the planned west line of the Pan-Asia Railway exit the country through Ruili.

Ruili has developed into a transfer station and colleting/distributing center of trade between China and Myanmar, and is an important portal for China to Southeast Asia and South Asia. At present, Ruili has two national ports, namely, Ruili and Wanting, as well as two border economic cooperation zones; besides, it owns the Jiegao Border Economic and Trade Zone, the sole border trade zone operating under the special management model of "inside the border while outside the customs."

- Pingxiang

Pingxiang Lies in Guangxi Zhuang Autonomous Region and borders Vietnam. There are two first-class national ports, Pingxiang Railway Port and Youyiguan Highway Port, as well as one second-class national port and five exchange market places on the frontier. Pingxiang is a port city with the most ports and the largest scale, and also the largest port for the border trade between China and Vietnam. Pingxiang Railway Port is the only border railway port in Guangxi, and the most convenient channel between China and the Southeast Asia.

Pingxiang Port Logistics Park possesses comparatively developed facilities. Pingxiang Comprehensive Bonded Zone is also an area under special customs supervision, presently featuring the highest opening level, enjoying the most favorable policies, having the fullest functions and requiring the least procedural bureaucracies in China's border area. China-AFTA (ASEAN Free Trade Area) Pingxiang Logistics Park lies in the forefront between China and ASEAN, and can provide all-around logistics service for import and export trade oriented to ASEAN countries.

- Zhangmu

There are five border ports in Tibet Autonomous Region at present, of which Zhangmu, Pulan and Jilong ports are first-class national border land ports. The Port of Zhangmu at China-Nepal border is now the largest border highway port in Tibet, and also the largest open port for China leading to the South Asian Sub-Continent.

The Port of Zhangmu undertakes the cross-border transportation of over 80 % of the total import and export trade volume between China and Nepal. China-Nepal Highway is a major channel for the economic and trade activities between China and Nepal.

13.2.5.2 Logistics Channel

- Lantsang-Mekong River international inland water transport channel

Lantsang-Mekong River[8] runs through China, Myanmar, Laos, Thailand, Cambodia and Vietnam and enters the South China Sea, and is an important water transport channel of China-AFTA. With the enthusiastic support and full cooperation of the governments within the water area, the tonnage of ships on Lantsang-Mekong River has been lifted to 300 t, and year-round navigation is basically attained.

At present, there are nearly 30 shipping companies on Lantsang-Mekong River international route; number of ships undertaking international shipping exceeds one hundred, with the collective shipping capacity reaching 12,000 t. Lantsang-Mekong River international service has developed from simple general cargo transportation to comprehensive transportation service of containers, large articles, refrigerated fresh goods and international tourism, with annual shipment quantity exceeding 400,000 t. Exported goods mainly include fruits from cold temperate zone, refrigerated vegetables, agricultural and non-staple products, large livestock, flowers and plants, etc.; imported goods mainly include tropical fruits, beverages, and palm oil.

- China-Myanmar land-ocean combined transport channel

The land-ocean combined transport channel from Kunming, China to Irrawaddy River in Yangon, Myanmar is called "China-Myanmar land-ocean combined transport channel" for short. It is a convenient transport channel for Yunnan and the Southwest Region of China to connect to Southeast Asia and South Asia. This channel is composed of highway, port and inland waterway. Highway from Kunming to Ruili undertakes most of the transportation within China, while inland waterway undertakes the transportation within Myanmar. The channel exits China via the Port of Ruili and follows the highway to Bhamo of Myanmar, then switch over to waterway along Irrawaddy River and terminates at Yangon. Water-water transfer of considerable cargos in inland Myanmar and the Southwest Region of China can be accomplished at the Port of Yangon.

The channel provides an exit to the Indian Ocean for China. Through this channel, the transport distance of cargos from Yunnan Province and the Southwest Region of China to the Indian Ocean and Europe is 3,000 km shorter than the route through the Pacific Ocean and the Strait of Malacca.

- Trans-Asian Railway

Trans-Asian Railway (TAR) is a partially completed unified freight railway network running across Eurasia and involves 28 countries, with the total length of

[8] Lantsang-Mekong River is called Lantsang in China and Mekong River after it leaves the border.

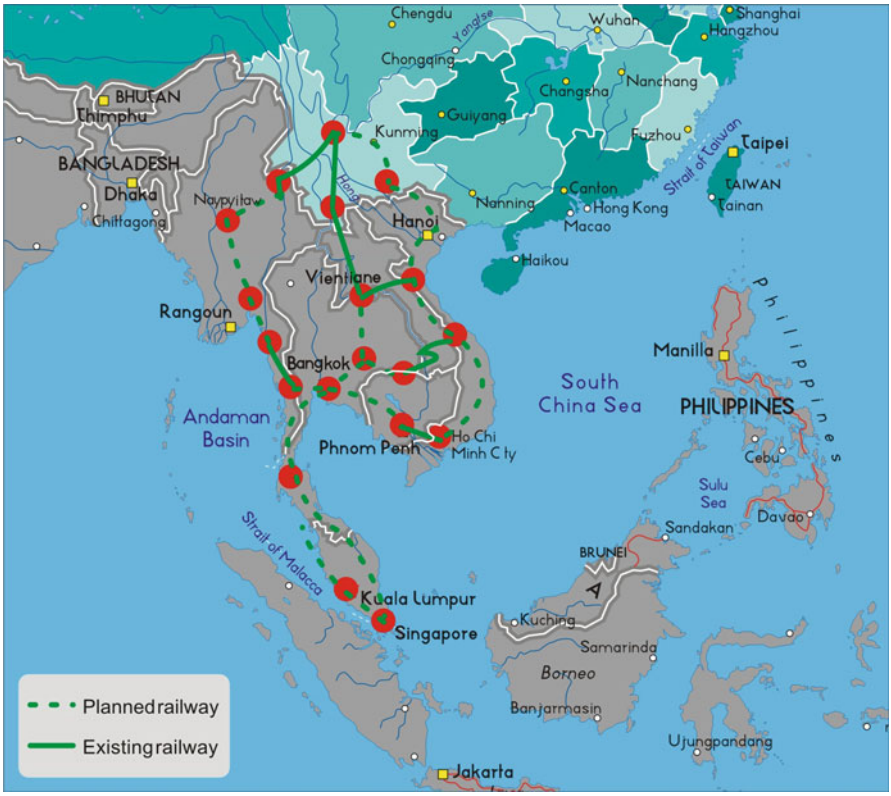

Fig. 13.7 Map of TAR

81,000 km. 18 Asian countries[9] formally signed the *Intergovernmental Agreement on the Trans-Asian Railway* and launched the construction of the project in April of 2010. TAR starts from Kunming in the Southwest Region of China, and terminates at Singapore after running through Vietnam, Cambodia, Myanmar, Thailand and Malaysia, which enables China to closely connect with Southeast Asian countries, as shown in Fig. 13.7.

But due to the great difference in technical standards, customs, quarantine procedures and safety inspection of each country along the railway, as well as the large amount of capitals required for construction, the task of accomplishing the unified construction soon is difficult.

- China-Myanmar oil and gas pipeline

China-Myanmar oil and gas pipeline is one of the four strategic energy channels of China. The gas line and oil line generally run side by side, which starts from Kyaukpyu and terminates in Kunming via the Port Ruili. It is preliminarily planned

[9] The 18 countries include: Armenia, Azerbaijan, Cambodia, China, Indonesia, Iran, Kazakhstan, Laos, Russia, South Korea, Turkey, India, etc.

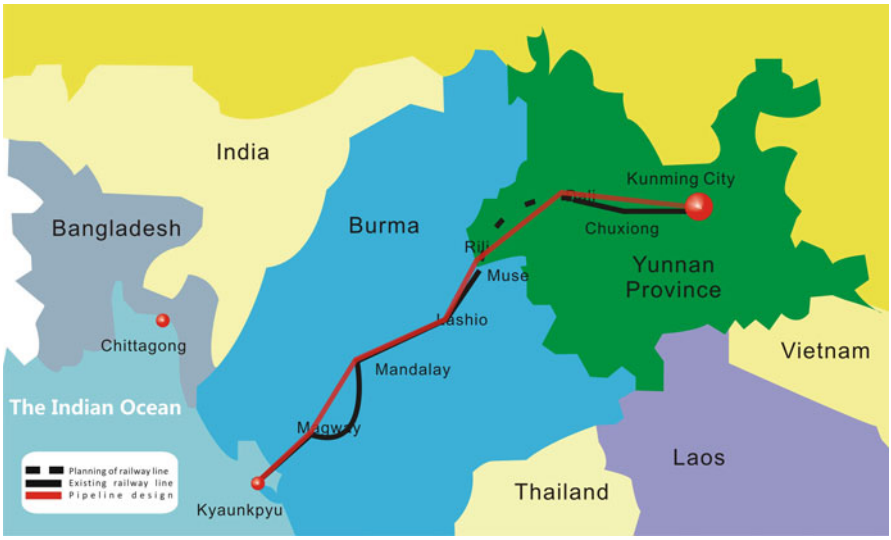

Fig. 13.8 Map of China-Myanmar oil and gas pipeline

that 22 million tons of crude oil and 12 billion cubic meters of natural gas could be transmitted through the pipeline. The construction of the pipeline was launched in 2010 and planned to be finished by the end June in 2013. The specific route is illustrated in Fig. 13.8.

13.3 Operations Conditions of Cross-Border Logistics in Inland China

With the increase of cross-border logistics and the improvement of infrastructure in China, there are more and more logistics enterprises undertaking cross-border logistics service. Cross-border market is taking shape, and operational modes of cross-border logistics service are gradually being innovated. Meanwhile, problems due to singular function, low service level, shortage of overall planning still exist in cross-border logistics service.

13.3.1 Main Characteristics of Cross-Border Logistics System Operations

13.3.1.1 Continual Growth of Port Handling Capacity

In recent years, foreign trade of border ports in China expands rapidly, and the port handling capacity is also increased continuously.

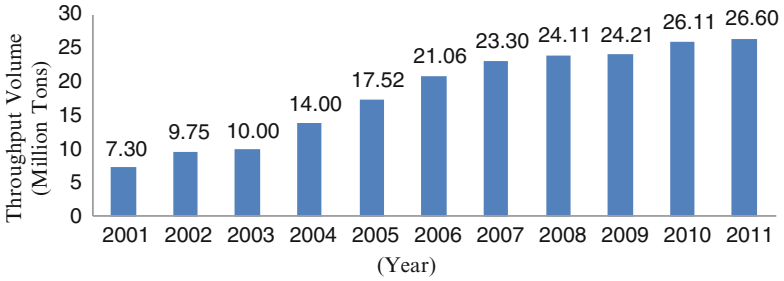

Fig. 13.9 Throughput of the port of Manzhouli for 2001–2011

Manzhouli has been the largest land port in China. The growth of import and export freight volume at the Port of Manzhouli has noticeably slowed down due to the global financial crisis in 2008. But under the promotion effort of local government through various measures such as strengthening cross-border exchange and encouraging faster customs clearance, throughput volume of the port ceased to decline and rose considerably. In 2010, the throughput volume of the Port of Manzhouli exceeded 26 million tons. Figure 13.9 shows the throughput volume of the Port of Manzhouli for 2001–2011.

Throughput of the Port of Alataw Pass in the Northwest Region increased year by year since the customs opened in 1991. In 2010, the throughput of the port reached 25.24 million tons. Figure 13.10 shows the throughput volume of the Port of Alataw Pass for 2001–2010.

Pingxiang in Guangxi and Hekou in Yunnan are traditional and time-honored railway ports on the China-Vietnam border. Since the re-opening of China-Vietnam railway transport in 1990, both ports have developed rapidly. The Port of Pingxiang is the largest port for China to import and export fruits from ASEAN, with import and export volume reaching 1.05 million tons in 2011. The Port of Hekou in Yunnan ranks first in Yunnan Province for the eight consecutive years in terms of throughput volume, with a volume reaching 2.41 million tons in 2011, and registering a year-on-year increase of 47.2 %.

13.3.1.2 Effect of the Economic Development and Trade Policies of Neighboring Countries

The development of cross-border logistics in inland China is greatly affected by the level of economic development of the neighboring countries. Since most ports correspond to the appointed ports in neighboring countries, the relationship with trade partners is obviously “one-to-one”. Due to the high concentration of trade partners, the development of port logistics depends largely on the social and economic development of the neighboring countries. The more prosperous and developed the economy of the neighboring countries is, the more dynamic the port logistics economy will be, and the better the port logistics will develop.

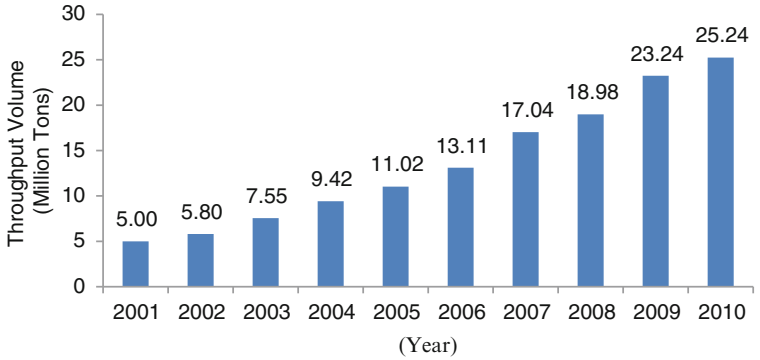

Fig. 13.10 Throughput volume of the port of Alataw pass for 2001–2011

Over-dependence on neighboring countries will also lead to high policy risk. Changes in trade policy of neighboring countries will directly lead to uncertainty of the demands for port logistics, which will exert extremely great influence to cross-border logistics. For example, Russia's restriction over timber export had once seriously frustrated the wood processing industry of border ports in the Northeast Region of China.

13.3.1.3 Gradual Integration of Cross-Border Logistics System with Domestic Logistics System

While promoting the construction of cross-border logistics channels, China is strengthening the interconnection of cross-border channels and inland channels. With the active improvement of infrastructure and port logistics functions by port cities, port throughput capacity and customs-clearance efficiency are also significantly enhanced. Some well-operated port logistics parks successfully fuse together the functions of transportation, warehousing, loading/unloading, processing, alignment, distribution, and information to provide multi-functional and integrated comprehensive logistics services for customers. Cross-border logistics system is gradually becoming integrated with domestic logistics system.

13.3.2 Main Problems in Cross-Border Logistic System Operation

13.3.2.1 Layout and Functions of Logistics Nodes Need Improvement

The layout of cross-border logistics nodes in China is mainly influenced by trade nodes. Since most of trade nodes were formed naturally, the density of transportation network among logistics nodes is generally low. Judging from a macro perspective, the construction of cross-border logistics nodes lacks overall planning stance.

Furthermore, the construction of cross-border port parks depends predominantly on investment of enterprises. Due to the high cost and difficulty involved, the construction of infrastructure for transportation, warehousing, clearance cargo inspection and informatization is comparatively lagging. The pace of construction and development of port logistics infrastructure can hardly meet the requirements of cross-border logistics service.

13.3.2.2 Scale and Services of Port Logistics Enterprises Need Upgrading

Most logistics markets of border ports in China are still in the preliminary stage; the markets are in disorder and their operations are not standardized. The condition of port logistics enterprises are large in number, small in size, scattered in distribution and weak in strength, and their scale and service level need to be enhanced. Logistics enterprises are predominantly freight forwarding enterprises, most of which are transformed from traditional transport companies or storage and transport companies. Their services are limited to general transporting, warehousing and handling; and so much so that problems of small scale, non-standard management, and low specialization of logistics service are quite common. In terms of service scope, few logistics enterprises can extend their services into inland and foreign countries.

13.3.2.3 Logistics Services Characterized by Simplicity and Low Added Value

Over 70 % of the goods imported and exported through border ports of China are products from out-of-area, that is, exported products are predominantly from inland areas and imported products are directly transported to inland areas. Led by trade development, a variety of business-oriented logistics nodes arise which are backed by the inland and radiating to the neighboring countries. But such circulation model with both production and sales away from the ports deprives the port of value-added processing, and hinders the improvement of port logistics functions.

13.3.3 New Operational Modes of Cross-Border Logistics

With the rapid increase of cross-border logistics, many logistics enterprises are seeking more economical, rational, efficient and faster international logistics operational modes, including “exiting without exporting” of domestically traded commodities in the Northeast Region, and transnational combined transport of Chongqing inland cargos to Europe through railway.

13.3.3.1 Cross-Border Land-Ocean Combined Transport of Domestically Traded Goods

Cross-border land-ocean combined transport of domestically traded goods refers to the process of transporting domestically traded goods to the sea via ports through cross-border transportation, then transferring them back into the country, by way of land-ocean combined transport, and managing through the "exiting without exporting" mode. At present, the mode has been put into operation in the Northeast Region of China.

Over the past years, most of domestically traded goods in the Northeast Region of China were first transported to the Port of Dalian in the south, and then transported to other regions through waterway or highway. The transportation time of this mode was quite long, and railway transport was often restricted by limited transport capacity in the south. In 2011, the new mode of land-ocean combined transport of "exiting without exporting" was put into operation. The goods are put into containers and transported form Mudanjiang City of Heilongjiang to Vladivostok, Vostochny and Nahodka of Russia across the border. After loading on ships, goods are transported to Shanghai, Ningbo, Guangzhou and other ports of China through the Sea of Japan, the Huanghai Sea and the East China Sea, and then transferred back into southern inland.

The northeast border area of China has great potential in carrying out cross-border transportation. Besides the mode of "China-Russia-China," that is, from Mudanjiang to Shanghai, Ningbo and Guangzhou through the Port of Vladivostok, there are also other multiple cross-border transportation modes. One of these is the mode of "China-Russia-other countries," that is, from Mudanjiang to main ports of Japan, South Korea, Europe and the United States through Vladivostok. Another is the mode of "China-Russia," that is, conducting import and export trade between Mudanjiang and Russia. Still another is the mode of "other countries-Russia-China," that is, from the main ports of Japan, South Korea, Europe and the United States to Mudanjiang and southeast coastal ports of China through Vladivostok. At present, Jilin Province is pilot-testing the "cross border land-sea-land" mode, in which, goods are transported from the Huichun to the Port of Rajin in North Korea across the border and then transferred to Shanghai and Ningbo through waterway.

13.3.3.2 Combined Transport of Inland Goods via International Trains

Combined transport of inland goods via international trains refers to the transportation method of transporting inland goods of China to Europe via the Eurasia Continental Bridge by international trains. This is an innovation and development of ocean-railway combined transport via continental bridge. At present, the transportation method has begun operation in Chongqing, and Xi'an International Logistics Park is considering adopting a similar mode.

The major land transportation channel between China and Europe is the continental bridge. The north route of the continental bridge enters the Northeast

Region of China after crossing over Siberia of Russia, while the south route runs to Lianyungang in Jiangsu along Longhai Railway after entering China through Xinjiang from Central Asia. Although the two continental bridge routes have existed for a long time, this transportation mode has low efficiency and high cost. Therefore, over 90 % of the cargos from inland China to Europe were transferred to Europe through waterway from coastal ports.

The international "Chongqing-Xinjiang-Europe" Railway for inland cargo in Chongqing Municipality starts from Chongqing, passes through Xi'an, Lanzhou, and Xinjiang, enters the Eurasia Continental Bridge and terminates at the Port of Duisburg of Germany after running through Kazakhstan, Russia, White Russia and Poland, with the total length of 11,179 km. The time of transportation through "Chongqing-Xinjiang-Europe" Railway is 30 days shorter than that through traditional waterway. Although the cost of waterway transportation is lower than that of the railway, the overall cost of transportation to Europe through "Chongqing-Xinjiang-Europe" Railway is lower due to the faster turnover. In September of 2011, at the "Chongqing-Xinjiang-Europe" international railway combined transport joint conference, a 16-day transport time was ensured and the target of "12 to-14-day" normal transport time was set for the route. Efforts will be made to further reduce the transportation charge.

After the negotiation of the six countries along the channel, Chongqing and Europe were chosen respectively as the starting and ending nodes of the railway combined transport; effective measures were taken to improve the pace of customs clearance, as a result, the Chongqing railway hub was endowed with the function of port bridgehead. In terms of organization and coordination, railway departments of the six countries jointly determined the five key factors of operation, including starting point, ending point, route, time and price of the operating channel, and formulated the operating time table, thus ensuring that the trains setting out from Chongqing are scheduled train. Railway departments of the six countries also jointly set up logistics enterprises, so as to organize the two-way delivery of cargos between China and Europe. High-efficiency customs clearance platform, "five-set scheduled train" time table formulated by railway departments and transnational logistics enterprises platform are important foundation for the operation of the mode.

In addition, the Xi'an International Logistics Park, relying on its favorable location and transportation advantage, its industry foundation and logistics demand, is further expanding the port service functions of its inland ports, and promote the full cooperation of the countries along the Continental Bridge. At present, it is actively promoting matters related to the "five-set scheduled train" from Xi'an to Rotterdam.

13.4 Summary

This chapter presents the development of cross-border logistics systems of inland China. China's borderline is long, its topography is quite complex. The inland cross-border logistics system is composed of multiple transportation means with

different development level. Since the economy of China is highly complementary with that of its land neighboring countries, economic and trade exchange between China and these land neighboring countries are increasing with the recent accelerated opening of China's inland area. The Central Government and the local governments of inland border area attach great importance to the planning and construction of cross-border logistics system, and have invested a large amount of capital in it. Logistics infrastructures of inland border area are gradually being improved. Many important logistics nodes and channels have been established in the Northeast Region, the Northwest Region, and the Southwest Region. Despite the existing problems of unplanned layout of logistics network nodes, weak markets and low logistics service level, more and more enterprises are attracted to join the market of cross-border logistics service due to its great development potential. Numerous operational modes of cross-border logistics are also being innovated.