Development of China’s retail logistics

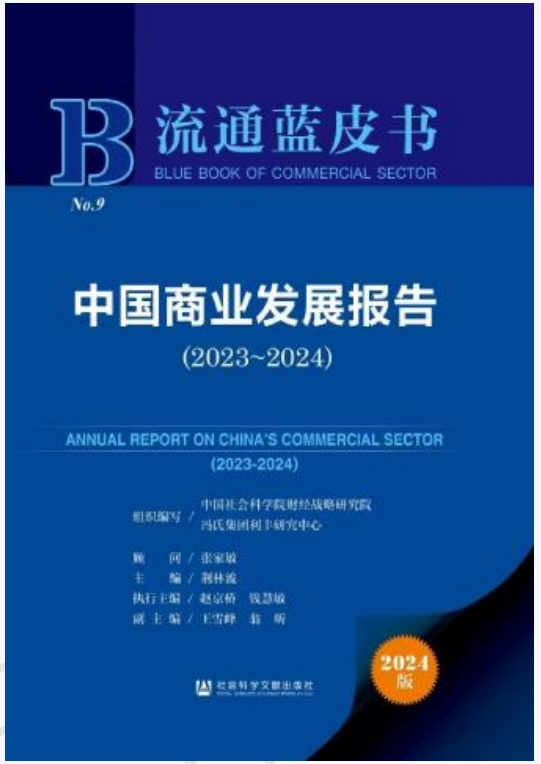
Blue Book of China's Commercial Sector:

Annual Report on China's Commercial Sector (2023 -2024)

Introduction

- This report examines the current state of retail logistics in China, focusing on the emergence of innovative logistics models. These models include express delivery services, advanced urban warehousing, community group buying, cold chain logistics, and the multifunctionality of courier stations.
- Dynamic retail demands have driven significant logistics reforms. Key trends include the digitization of logistics, adoption of unmanned delivery systems, development of air transport for courier services, increased emphasis on environmental, social, and governance (ESG), and supportive policies.
- The report concludes by addressing key challenges such as intense competition in the express delivery sector, delays in integrating warehousing and distribution, inadequate cold chain infrastructure, and the dilemma between labour shortage and automation.
- Overall, the report offers valuable insights into the development, challenges, and prospects for China's retail logistics sector.

The content in this report is based on the Chinese article published in the Blue Book of China's Commercial Sector (2023-2024).



Contents

- Current development of retail logistics in China
- New retail logistics models
  - Instant retail and same-day delivery
  - Upgrades and transformation of the front-end warehouse model
  - Prepared meal and cold chain logistics
  - Diversification of courier station functions
- Diversified retail demands driving logistics transformation
  - Advanced logistics technology
  - Unmanned delivery reduces labour costs
  - Air transport enhances national delivery efficiency
  - Importance of environmental, social, and governance (ESG)
  - Policy support
- Challenges and outlook
  - Intense competition in express delivery
  - Lagging integrated B2C warehousing and distribution
  - Insufficient cold chain infrastructure
  - Labour shortages and automation dilemma

Current development of retail logistics in China

- China's total retail sales of consumer goods reached 44 trillion yuan in 2022, a slight year-on-year decrease of 0.2%. Nevertheless, online retail continued steady growth, reaching 13.8 trillion yuan, up 4.0% year-on-year (yoy).
- Flourishing online retail activities have propelled rapid growth in China's logistics and express delivery industry:
  - Total logistics value reached 347.6 trillion yuan in 2022, up 3.4% yoy. Total logistics costs amounted to 17.8 trillion yuan, increasing by 4.4% yoy, accounting for 14.7% of GDP (up 0.1 percentage points from 2021).
  - Transportation costs were 9.6 trillion yuan (up 4.0% yoy), storage costs 6.0 trillion yuan (up 5.3% yoy), and management costs 2.3 trillion yuan (up 3.7% yoy).
- Consumers now commonly expect 'next-day' and 'same-day' delivery. The express delivery market supports rapid growth in both online and offline retail. In 2022, express delivery volume reached 110.6 billion packages, up 2.1% yoy.
- According to the State Post Bureau, from January to July 2023, express delivery volume reached 70 billion packages, up 15.5% yoy. The total volume for 2023 is expected to exceed 120 billion packages, surpassing 10% growth.

New retail logistics models

Instant retail and same-day delivery

- Instant retail transaction volume in China grew from 227.5 billion yuan in 2021 to 353 billion yuan in 2022 and is projected to reach 537.3 billion yuan in 2023. Instant retail is becoming mainstream, shifting logistics from fixed, large-batch models to frequent, small-batch deliveries.
- This model primarily manages intra-city deliveries using location-based services (LBS) and intelligent allocation systems for efficient door-to-door service.
  - Manufacturers deliver goods to city depots near consumers for temporary storage. When orders are placed via apps, items are picked, packed, and delivered by riders from local depots such as stores, frontline warehouses, or convenience stores.
  - Instant retail combines features of e-commerce and traditional retail, delivering a broad range of items from prepared foods to fresh fruits, snacks, daily necessities, cosmetics, and electronics.
- Meituan, the largest instant retail platform, covers 2,800 cities and counties with over one million riders. Leveraging big data, AI, cloud computing, and IoT, Meituan has developed a real-time intelligent scheduling system to maintain stable delivery services even during adverse weather or disruptions.
- Alibaba, JD, Pinduoduo, Douyin, and Kuaishou also operate or are developing instant retail logistics platforms, such as Fengniao, Cainiao, and Dada.

Picture source: https://m.huxiu.com/article/637361.html

Upgrades and transformation of the front-end warehouse model

- In 2022, many front-end warehouse operators shifted focus from scaling to optimizing warehouse locations and layouts, prioritizing cost reduction and efficiency to stabilize operations in first- and second-tier cities.
- Leading operators are expanding product assortments beyond fresh food towards full-category offerings, aiming to reduce waste and increase gross profit and average order value. For example, the proportion of fresh products at Pupu Supermarket dropped below 30%, while Dingdong Maicai is exploring new product categories.
- Since 2023, major players like JD and Meituan have resumed expanding front-end warehouse operations after prior stagnation
- Supported by third-party instant delivery, the front-end warehouse model aims to minimize costs through direct sourcing, narrowing price gaps with traditional e-commerce and achieving economies of scale.

Picture source: https://finance.sina.com.cn/roll/2024-11-07/doc-incvfyqt2171926.shtml

Picture source: https://www.sohu.com/a/723631721_121444933

Prepared meal and cold chain logistics

- According to CICC Securities, China's prepared meal market reached 422 billion yuan in 2020 and is expected to grow to 800 billion yuan by 2025.
- The prepared meal model extends from community fresh produce e-commerce, requiring pre-processing, cooking, and temperature-controlled delivery of fruits, vegetables, meats, and seafood.
- In 2022, nearly 70,000 prepared meal companies operated in China with a B2B to B2C ratio of approximately 8:2:
  - B2B focuses on central kitchen cooking, which fulfils orders for restaurants, hotels, and supermarkets, prioritizing cost control.
  - B2C focuses on heating processes, delivering meals to supermarkets for end consumers through online and offline channels.
- The prepared meal model drives the standardization and normalization of cold chain logistics processes, including equipment, storage, and refrigerated transport.

Prepared meal and cold chain logistics (cont.)

- B2B market remains stable, while B2C market is attracting new entrants and offers higher gross margins. Integration of the two is expected to grow.
- Companies like Meituan, Dingdong Maicai, Hema, and JD leverage digital systems and algorithms to capture young consumers and reduce costs, improving gross margins.
    - JD Fresh operates 19 cold chain warehouses covering 288 cities and up to 80% of urban consumers; other prepared meal companies collaborate with JD to access this network.

Picture source: https://opinion.southcn.com/node_e4f9db6b4d/fa62113365.shtml

Diversification of courier station functions

- In 2022, the average person in China used courier services nearly 80 times annually, about once every five days.
- Courier stations are critical package pickup and delivery hubs with potential to monetize traffic by providing value-added community retail services.
- Profitability requires processing at least 15 outgoing and 500 incoming packages daily. Exceeding this volume would require more staff and thus incur higher costs, highlighting the difficulty in achieving profitability and prompting transformation.
- Cainiao operates a dense network of over 170,000 courier stations nationwide and is repositioning itself as a digital community service brand, expanding into group buying, recycled goods collection, laundry, and more.
- Other players such as YTO Mama Station, ZTO Tuxi Supermarket, and Yunda Express Supermarket are also exploring community commerce.

Picture source: https://www.wenxiaobai.com/api/expends/detail?article=3f648faa-e77f-4004-a6b0-bc22414fdefa

Diversified retail demands driving logistics transformation

Advanced logistics technology

- Other players such as YTO Mama Station, ZTO Tuxi Supermarket, and Yunda Express Supermarket are also exploring community commerce.
- AI and machine learning offer solutions by automating data entry processes, and integrating and analysing data from diverse stakeholders to forecast consumer demand and select logistics partners.
- Image recognition technology helps monitor goods and equipment conditions, enhancing automation and visibility.
- SF Express has developed a proprietary big data platform for global logistics coordination and for uncovering hidden business value.
- JD Group's JD Cloud integrates smart supply chains and consumer ecosystems to enhance operations.

Picture source: https://zhuanlan.zhihu.com/p/22499329042

Advanced logistics technology (cont.)

- China's smart warehousing market grew from 77.3 billion yuan in 2018 to 135.7 billion yuan in 2022, driven by technologies such as AI, big data, cloud computing, IoT, VR, environmental sensing, autonomous positioning, routing algorithms, robots, sensors, and RFID.
- These technologies enable smoother operations, labour savings, cost control, improved space utilization and efficiency enhancement.

Picture source: http://www.cn156.com/cms/chanpin/92541.html

Unmanned delivery reduces labour costs

- Delivery and pickup services remain expensive due to labour shortages and unresolved pain points.
- Tech companies and retail giants are developing unmanned delivery via robots, vehicles, and drones, and piloting ‘contactless delivery’ for hospitals and communities.
  - JD provided unmanned delivery to Wuhan’s Ninth Hospital for daily and medical supplies.
  - Meituan offers unmanned vehicle delivery in Beijing’s Shunyi District with autonomous scheduling and no human contact.
- Technological progress and relaxed urban regulations are fostering unmanned delivery ecosystems. However, challenges remain due to complex road conditions (vehicles, pedestrians, stairs, elevators, etc.) and non-standard scenarios.
- Currently, unmanned services are mostly tested in controlled environments like university campuses and small-scale routes, e.g., JD Logistics' Dada robot delivery in Suzhou, Jiangsu.

Picture source: https://www.wenweipo.com/a/202107/29/AP6101bec1e4b08d3407d0a467.html

Unmanned delivery reduces labour costs (cont.)

- Drones offer faster speeds, lower costs, and fewer obstacles compared to ground vehicles.
- Meituan's drone delivery milestones:
  - Began pilot in 2017, first successful delivery in 2021 in Shenzhen.
  - Over 160,000 flights from 2021 to 2023 in cities such as Shenzhen and Shanghai.
  - Launched its fourth-generation drone with 35% delivery range increase in July 2023.
- With policy support and technology advances, drone delivery is poised for rapid growth.

Picture source: https://m.mp.oeeee.com/oe/BAAFRD000020220909721115.html

Air transport enhances national delivery efficiency

- China's cross-border e-commerce market reached 15.7 trillion yuan in 2022, with import e-commerce at 3.4 trillion yuan (up 6.3% yoy).
- The State Council has established 165 cross-border e-commerce comprehensive pilot zones as of May 2023, covering 31 cities and regions
- Air freight capacity is critical for interprovincial and international e-commerce.
- Infrastructure highlights:
  - SF Express and Hubei Government jointly opened the Ezhou Huahu Cargo Airport in July 2022, boosting SF's efficiency.
  - YTO's Jiaxing Airport and JD's Nantong Airport are under construction.
- JD Airlines received its Air Carrier Operating Certificate in August 2022, planning domestic city coverage by 2025 and expansions to key global freight markets. Given JD's focus on high-value electronics, air freight will improve delivery safety and timeliness.

Picture source: https://www.sf-express.com/chn/sc/news/186

Importance of environmental, social, and governance (ESG)

- Growing consumer awareness and demand for green supply chains and sustainable practices requires companies to align business philosophies and operations with ESG goals.
- Environmental (E) efforts include carbon reduction through resource recycling, data-driven emission management, eco-friendly and recyclable packaging, standard logistics containers, pallet-sharing, automated energy-saving warehouses, and zero-emission logistics parks.
- Leading companies like SF Express and JD Logistics have set emission targets and implemented green measures, contributing to China's 'Dual Carbon' (carbon neutrality and peak emissions) goals.
- The Ministry of Transport's '14th Five-Year Plan for Green Transportation' (released in 2022) aims for widespread adoption of clean and low-carbon transport infrastructure and vehicles by 2025.

Picture source: https://shorturl.at/mXsAB

Importance of environmental, social, and governance (cont.)

- Social (S) efforts focus on compliance, service quality, labour rights, and community engagement. JD Logistics allocated 10 billion yuan to improve employee welfare after acquiring Deppon Logistics.
- Companies support rural revitalization by improving logistics of agricultural products, e.g., Cainiao's network connects over 1,000 county-level distribution centers and 50,000 rural stations.
- Governance (G) initiatives address organizational structure, shareholder rights, fraud prevention, data transparency, and long-term strategic planning amid growth challenges.

Policy support

Release Date	Issuing Authority	Plan Name
15 December 2022	State Council	14th Five-Year Plan for Modern Logistics Development
7 July 2022	Ministry of Housing and Urban-Rural Development; National Development and Reform Commission	14th Five-Year National Urban Infrastructure Plan
16 February 2022	Civil Aviation Administration	14th Five-Year Special Plan for Air Logistics Development
28 December 2021	State Post Bureau	14th Five-Year Plan for Postal Industry Development
27 December 2021	State Council	14th Five-Year Plan for Urban and Rural Community Service System Development
17 November 2021	Ministry of Industry and Information Technology	14th Five-Year Plan for Deep Integration of Information Technology and Industrialization
8 July 2021	Ministry of Commerce	14th Five-Year Commercial Development Plan

Challenges and outlook

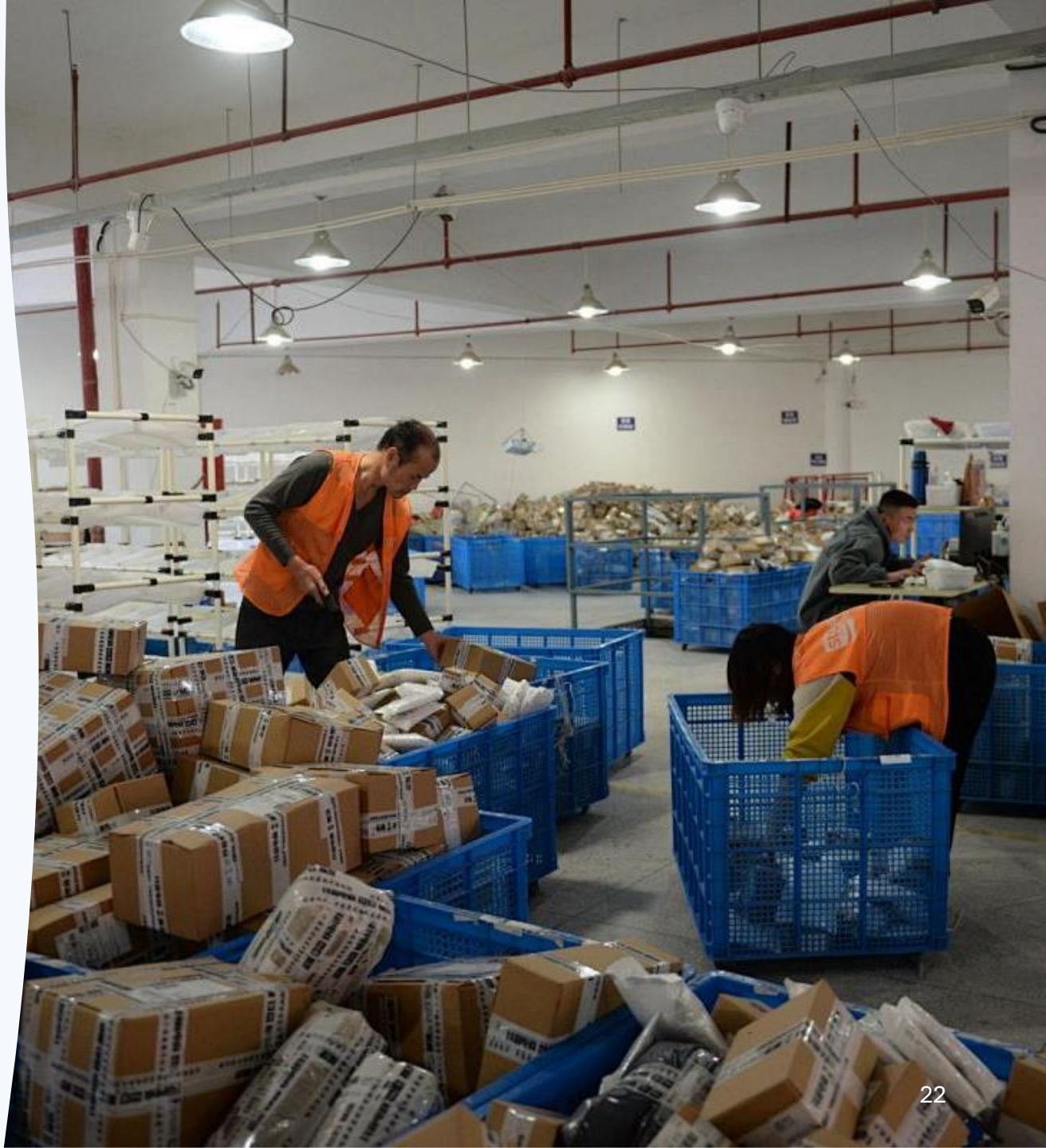
Intense competition in express delivery industry

Picture source: https://www.sohu.com/a/745886444_100064420

- Major express delivery companies have invested heavily in nationwide networks. Regional economic disparities cause uneven parcel volumes between coastal and inland areas, limiting scalability and profitability.
- Early 2021 price wars aggressively cut prices to gain market share. Net profits dropped to as low as 0.1 yuan per package.
- Despite large scale, Chinese express companies have thinner margins than counterparts in developed countries. Some faced losses and bankruptcies during price wars.
- Government regulatory interventions stopped destructive price competition starting Q2 2021; average prices per shipment have since rebounded.
- Companies are diversifying beyond delivery to upstream services and integrating warehousing, distribution, express delivery, and cold chain services.

Lagging development of integrated B2C warehousing and distribution

- Some contract logistics providers offer integrated B2B warehousing and distribution services for retailers and distributors.
- However, integrated warehousing and distribution services for B2C shipments and instant retail orders remain underdeveloped.
- To improve, logistics firms must strengthen service capabilities, supply chain design expertise, and apply advanced logistics facilities and technologies.
- Big data-enabled sales forecasting allows better inventory allocation near sales areas, enabling rapid order fulfilment.
- Automated order fulfilment systems allow centralized inventory management and timely restocking.



Picture source: http://www.ywstzn.com/newsinfo/16

Insufficient cold chain infrastructure

Picture source: https://www.byllwl.com/shlcys/152.html

- Imbalance exists between coastal and inland cold chain logistics supply and demand.
- Refrigerated vehicle scarcity in central and western regions contrasts with the need for better cold chain management systems in eastern regions.
- The 14th Five-Year Plan for Cold Chain Logistics Development (2021) targets forming a nationwide cold chain network by 2025 connecting production, sales, urban-rural areas, and domestic-international markets.
- Outdated hardware lacking digital information transmission capabilities hinders real-time monitoring of temperature and humidity, risking food and pharmaceutical safety.
- Digital technology adoption of temperature sensors and automated valves helps improve efficiency and product safety.
- Rapid evolution requires well-trained workers capable of identifying risks throughout the cold chain.

Dilemma between labour shortage and automation

- Over 50 million people are engaged directly in logistics, impacting over 100 million family members.
- Aging demographics threaten the sustainable supply of domestic labour.
- Companies must invest in advanced logistics technologies to maintain capacity and efficiency, emphasizing ‘human-machine integration’.
- Yet automation brings new challenges. Intelligent tools (e.g., smart helmets that provide voice prompts and monitor riders) can stress workers, imposing tight control and increasing fatigue risks.
- Automation may displace traditional jobs: unskilled warehouse sorters, packers, drivers, couriers, and riders unable to adapt may be replaced by machines or tightly controlled digitally.

Picture sources: https://ishare.ifeng.com/c/s/7j0OnRFlRpA & http://it.people.com.cn/BIG5/n1/2020/1020/c1009-31898267.html

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