

Study on International Logistics Service Trade and Sustainable Development of Ecological Environment

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ABSTRACT

How to transform and upgrade the traditional transport service trade into a modern logistics service trade is of great significance for studying the coordinated development of logistics service trade and ecological environment. This paper analyzes the export structure of service trade and the export trend of logistics service of ten major countries in the world. According to the analysis results, the evaluation index system of the coordination degree of the logistics service trade-ecological environment complex system was constructed and used to analyze the coordinated development type and level of the coordinated development of the logistics service trade and the ecological environment in each country. The results showed that the coordination degree of the logistics service trade-ecological environment complex system of various countries has shown a spiral development trend. This paper provides a theoretical basis for calculating the degree of coordination between regional logistics service trade and the ecological environment.

KEYWORDS

Compound System Coordination Degree Model, Coordinated Development, Ecological Environment, Logistics Service Trade

INTRODUCTION

With the continuous deepening of globalization and rapid economic development, the direction and structure of service trade are gradually expanding and penetrating into emerging industries such as finance, healthcare, and communication (Tan et al., 2006). However, traditional service industries such as tourism and transportation still occupy an important position (Parolo et al., 2009). Transportation service trade is a resource and labor-intensive industry (Francois & Woerz, 2008), and its development is closely related to the ecological environment (Chisuwa et al., 2019). In this study I aim to explore the coordination level between regional logistics service trade and ecological environment and to provide a theoretical basis for this field. By applying the theory of coordinated development to the logistics service industry, I have expanded my research perspective on the logistics

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service trade industry to promote the coordinated development of the regional logistics service trade and the ecological environment.

LITERATURE REVIEW

At present, the number of research results on the relationship between trade and environment is considerable (Chakraborty & Mukherjee, 2010). Domestic and foreign scholars mainly conduct theoretical and empirical analysis on the relationship between trade and environment from two aspects (Chen et al., 2018): the impact of international trade on environmental quality (Halicioglu & Ketenci, 2016) and the impact of environmental regulations (Dechezleprêtre & Sato, 2017) on international trade. The impact of international trade on environmental quality is mainly divided into three perspectives. The first is that the liberalization of trade can promote the sustainable development of the environment (Barros & Martínez-Zarzoso, 2022). Antweiler et al. (2001) used the pollution demand-supply model and selected SO₂ data from 1971 to 1996 for fixed effects and random effects regression analysis. Research shows that the technical effects and scale effects caused by trade can reduce the pollution concentration by 1.25% to 1.5%. He (2010) used different econometric methods to investigate the impact of China's service trade on China's air, water, and other environmental indicators, concluding that technical effects have the effect of reducing pollution to a certain extent. The second is that international trade will cause increased environmental pollution (Jayadevappa & Chhatre 2000). Sun and Zang (2009) used a mixed unit input-output model to measure energy consumption and pollutant emissions from commodity exports. The results showed that as China's export trade to the world grows, energy consumption intensity and pollutant emission intensity also increase at the same time. The third is that the relationship between the two is more complicated, and trade has no clear promotion or inhibition effect on the environment (Dean, 2002). Cole and Elliott (2003) studied the structural effects of trade based on the pollution paradise hypothesis and the factor endowment theory, respectively, and their conclusions showed that the net effect of trade on environmental quality varies with the selection of pollutants and dependent variables.

By reading the literature, I discovered that few scholars have studied the relationship between logistics service trade and the ecological environment (Evangelista et al., 2018).

MATERIALS AND METHODS

Coordination Degree Model of Composite System

This article takes the coordination degree of the composite system composed of the logistics service trade subsystem (E1) and the ecological environment subsystem (E2) as the research object (Cha, 2006). The indicators of its various subsystems are shown in Table 1. The order parameter of the logistics service trade subsystem $e1 = (e11, e12, \dots, e1n)$, the order parameter of the ecological environment subsystem $e2 = (e21, e22, \dots, e2n)$, where $n > 2$. The change of the order parameter may promote the development of the system in a better direction. Such variables are generally called positive indicators; that is, the greater the value of $e11, e12, \dots, e1n$, the higher the order of the system is. The change of the order parameter may also hinder the development of the system. Such variables are generally called negative indicators. That is, the larger the value of $e1k+1, \dots, e1n$, the lower the order of the system is. Therefore, the following definition shown in equation (1) is given for the degree of order of the order parameter of the subsystem:

$$\frac{1}{4} \left(e_{ik} \right) = \begin{cases} \frac{e_{ik} - \pm_{ik}}{2}, & i = 1, 2; k \in [1, k_1] \\ \frac{2}{e_{ik} - \pm_{ik}}, & i = 1, 2; k \in [k_1 + 1, n] \end{cases} \quad (1)$$

Equation (1) shows that $u_i(e_{ik}) \in [0, 1]$; the larger the value, the greater the contribution of the corresponding variable to the order of the subsystem. To comprehensively measure the order degree of each subsystem, I used the geometric average method to integrate the order parameter of the system, as shown in equation (2):

$$u_i(e_i) = \sum_{k=1}^n \gg_k \frac{1}{4} (e_{ik}), \quad \gg_k \geq 0; \sum_{k=1}^n \gg_k = 1 \quad (2)$$

Similarly, $u_i(e_i) \in [0, 1]$; the larger the value, the higher the order of the subsystem. Let $\frac{1}{4}^0 (e_i)$ be the order degree of the subsystem at t0 and $\frac{1}{4}^1 (e_i)$ be the order degree of the subsystem at t1. In this paper, the coordination degree E of the logistics service trade-ecological environment composite system is defined as shown in equation (3):

$$E = \sqrt{\left(\frac{1}{4}^1 (e_1) - \frac{1}{4}^0 (e_1) \right) \left(\frac{1}{4}^1 (e_2) - \frac{1}{4}^0 (e_2) \right)} \quad (3)$$

Table 1. Composite system coordination measurement index

Subsystem	Order Parameter	Index
Logistics service trade subsystem	Factors of production (e_{11})	Proportion of employment in service industry
		Air cargo volume
		Port container throughput
	Requirements (e_{12})	Per capita gross national income
		Residents' final consumption expenditure (% of GDP)
	Related and supporting products (e_{13})	Total trade in goods
		Added value of service industry (% of GDP)
Ecological environment subsystem	Horizontal competition (e_{14})	Foreign direct investment (% of GDP)
		Logistics service trade openness
		International transportation fuel
	Energy consumption (e_{21})	Clean energy consumption (% of total energy consumption)
		Energy consumption per unit of GDP
	Emission intensity (e_{22})	CO ₂ emissions from the transportation sector (% of total fuel combustion)
		NOx emissions
	Environmental protection business development	Forest cover rate

Entropy Method

The formula in equation (2) shows that the determination of the weights of the order parameters of subsystems plays a vital role in measuring the order of each subsystem. The methods for determining the weights are generally divided into subjective weighting method and objective weighting method (Mao et al., 2009). To avoid subjective weighting influence of factors, I adopted the entropy method to measure the weight of the order parameter of the subsystem (Gao et al., 2019); this method objectively evaluates the degree of influence of each factor on the order of the system and improves the accuracy and reliability of the result (Govindan et al., 2012). First, I used the formula in equation (1) to standardize the original data to eliminate the influence of different units and different metrics among the indicators. Second, I calculated the entropy value of each index. I set the m evaluation indexes and n evaluated objects and defined the entropy value H_i as shown in equation (4):

$$H_i = \frac{1}{\ln n} \sum_{j=1}^n f_{ij} |\ln f_{ij}|$$

Where $f_{ij} = \frac{x_{ij}}{\sum_{j=1}^n x_{ij}}$ (4)

Finally, according to the obtained entropy value, the weight of each index is determined as shown in equation (5):

$$\omega_i = \frac{1 - H_i}{\sum_{i=1}^m (1 - H_i)} \quad (5)$$

Evaluation Standard for Coordination Degree of Composite System

The coordination degree model of the composite system comprehensively reflects the coordinated development level of the logistics service trade and the ecological environment system (Yan et al., 2021). For this paper I classified the coordination degree of the composite system according to the value of E and classified the logistics service trade-ecological environment of 10 countries. I divided the degree of system coordination into three stages: dysregulation period, transition period, and coordination period, a total of 10 levels, and 30 types of development, as shown in Table 2.

RESULTS AND DISCUSSION

Analysis of the Status Quo of the Development of Logistics Service Trade

For this article I took the top 10 countries in the total service trade import and export volume in 2017 as the research object (Nordås & Rouzet, 2017) and divided these 10 countries into four categories: The first category is highly affluent developed countries, including the United States. The second category is moderately affluent developed countries, including Japan, Singapore, France, Germany, the Netherlands, and the United Kingdom. The third category is low-rich developed countries, including South Korea. The fourth category is developing countries, including China and India. Using the statistical data from 2001 to 2017 (Arvis et al., 2018), I analyzed the development status of service trade and logistics service trade in 10 countries from two aspects: the composition and proportion of service trade export categories and the total logistics service trade export and net exports (Wang et al., 2018).

Table 2. Types of coordinated development of logistics service trade and ecological environment

Dysregulation period	0–0.09	Extreme imbalance
	0.1–0.19	Severe imbalance
	0.2–0.29	Moderate disorder
Transition period	0.3–0.39	Mild disorder
	0.4–0.49	On the verge of dysregulation
	0.5–0.59	Barely coordinated
	0.6–0.69	Primary coordination
Coordination period	0.7–0.79	Intermediate coordination
	0.8–0.89	Well coordinated
	0.9–1	Excellent coordination

Note: If $E_1 < E_2$, the ecological environment is lagging. If $E_1 = E_2$, the logistics service trade is synchronized with the ecological environment. If $E_1 > E_2$, the logistics service trade is lagging.

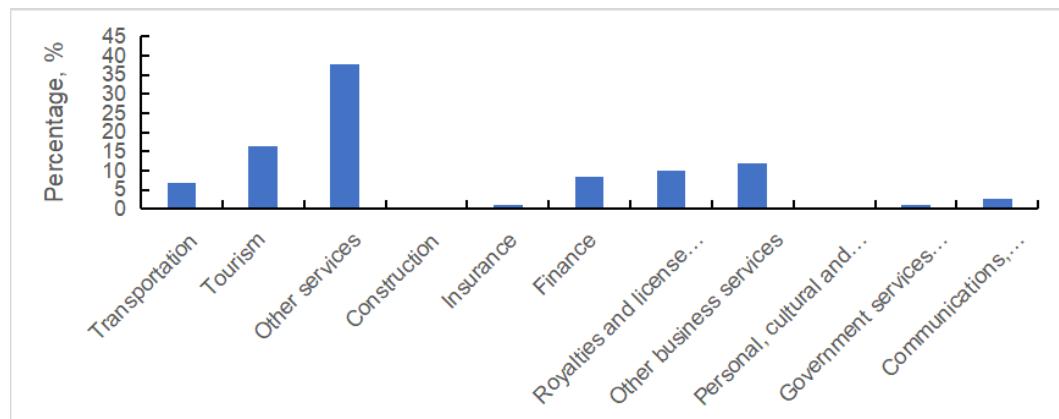
Highly Affluent Developed Countries

United States. In 2017, the total import and export volume of U.S. service trade was US\$1,318.985 billion, of which exports totaled US\$780.875 billion, imports totaled US\$538.11 billion, and the trade surplus reached more than US\$240 billion. From the perspective of service export structure, the main service export categories of the United States are tourism services, other business services, intellectual property royalties, financial services, and transportation services (Figure 1). The U.S. service trade has successfully completed its transformation to a modern service trade.

Moderately Affluent Developed Countries

Japan. In 2017, Japan's total import and export of services was US\$375.66 billion, of which service exports were US\$184.77 billion, service imports were US\$190.89 billion, and the trade deficit was US\$6.118 billion. From the perspective of service export structure, Japan's main service export categories are intellectual property royalties, other commercial services, transportation services, and tourism services. Japan has basically completed its transition to a modernized service trade, but its transport service exports still account for a relatively high proportion (Figure 2).

Figure 1. The composition of U.S. service exports in 2017



Singapore. In recent years, there has been a trend of deficit in Singapore's service trade. In 2017, Singapore's total service trade import and export was US\$335.475 billion, of which total service exports were US\$164.68 billion, total service imports were US\$170.795 billion, and service deficit was US\$6.115 billion. From the perspective of service export structure, Singapore's main export sectors are the transportation sector, other business services, financial sectors, and tourism services. Transport service exports account for the highest proportion and have been stable. This finding shows that Singapore is still focusing on the development of traditional service sectors. Its emerging service trade sector is still in its infancy.

France. In 2017, the total value of France's service trade imports and exports was US\$489.976 billion, of which service exports were US\$249.474 billion and service imports were US\$240.472 billion. French service exports are still dominated by transportation services and tourism services, but the proportions of services such as finance, insurance, and intellectual property are relatively low, indicating that France is also in the transition period from traditional service trade to emerging service trade.

Germany. In 2017, the total import and export volume of German service trade was US\$627.709 billion, of which service exports were US\$304.058 billion, and service imports were US\$323.647 billion. The main service export sectors are the transportation sector, the tourism sector, and the telecommunications and computer information service sectors.

The Netherlands. The Netherlands has always maintained a double surplus in trade in goods and services. In 2017, the total import and export of services in the Netherlands was US\$429.131 billion, of which service exports were US\$218.31 billion, service imports were US\$210.821 billion, and the service surplus reached US\$7.489 billion. From the perspective of service export structure, the main export categories of the Netherlands are telecommunications, computer information services, transportation services, intellectual property royalties, and other commercial services. Netherlands has basically completed the transformation of the traditional service trade industry to the emerging service trade industry.

United Kingdom. In 2017, the United Kingdom's total service trade import and export volume was US\$565.633 billion, of which service exports were US\$350.687 billion, and service imports totaled US\$214.946 billion. The trade surplus reached US\$135.741 billion. From the perspective of service export structure, the main service export categories of the United Kingdom are financial services, tourism services, transportation services and telecommunications, computer information services. The United Kingdom has completed the transition to modern service trade, but its traditional service trade still maintains a relatively stable development.

Lowly Affluent Developed Countries

South Korea. South Korea is a late-developing country in the field of service trade. In 2017, South Korea's total service trade import and export value was US\$209.466 billion, of which service exports were US\$87.497 billion, service imports were US\$121.969 billion, and the trade deficit was US\$34.472 billion. From the perspective of service export structure, the proportion of transportation and transportation service exports in Korea's service trade exports has always been the highest among all service trade sectors (Figure 3).

Developing Countries

China. In 2017, China's service trade import and export totaled US\$695.677 billion, second only to the United States and ranked second in the world. Among them, the service export value was US\$228.09 billion. Imports were US\$467.589 billion, and the trade deficit was US\$239.499 billion. China is in the early stages of transforming from traditional service trade to modern service trade (Figure 4).

India. In 2017, India's total import and export of service trade was US\$337.994 billion, of which service exports were US\$183.98 billion, service imports were US\$154.014 billion, and the trade surplus was US\$29.966 billion. From the perspective of service export structure, India's

Figure 2. The composition of service export categories of moderately affluent developed countries in 2017

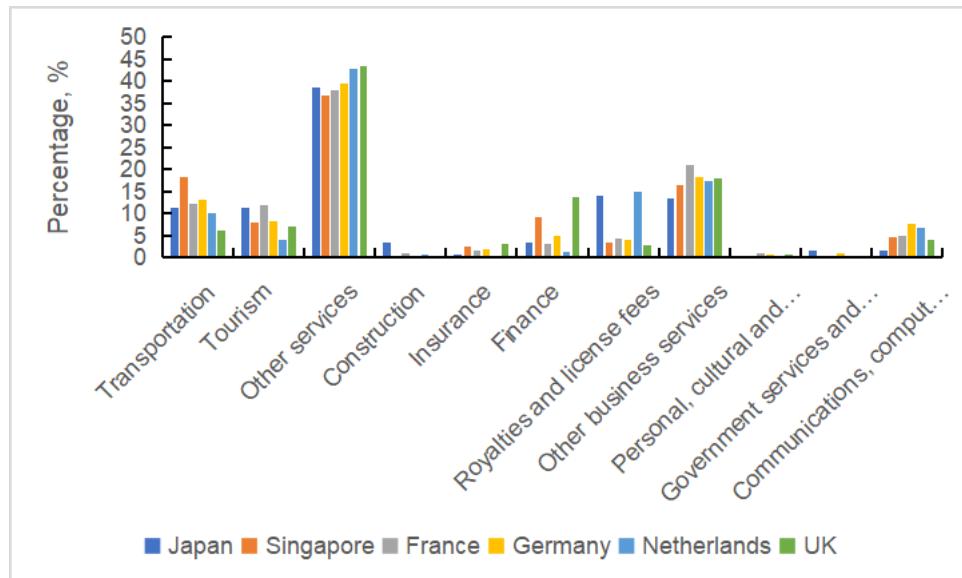
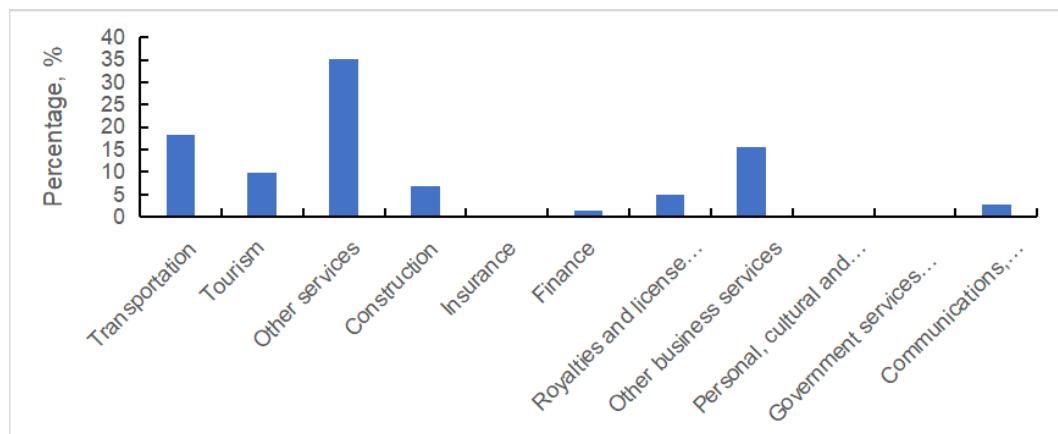


Figure 3. The composition of Korea's service export categories in 2017



main service export categories are telecommunications, computer and information services, other business services, and tourism services (Figure 5). India has basically completed its transformation and upgrading to modern service trade.

Analysis on the Development Trend of Logistics Service Trade

Highly Affluent Developed Countries

United States. The export of logistics services in the United States has maintained a relatively steady growth rate, increasing from US\$41.457 billion in 2001 to US\$90.701 billion in 2014. Although the logistics service trade in the United States has maintained a trade deficit for a long time, Figure 6 shows that this trade deficit has shown a slowing trend in fluctuations. Because in recent years, the U.S. service trade has been transforming into a modern service sector.

Figure 4. The composition of China's service export categories in 2017

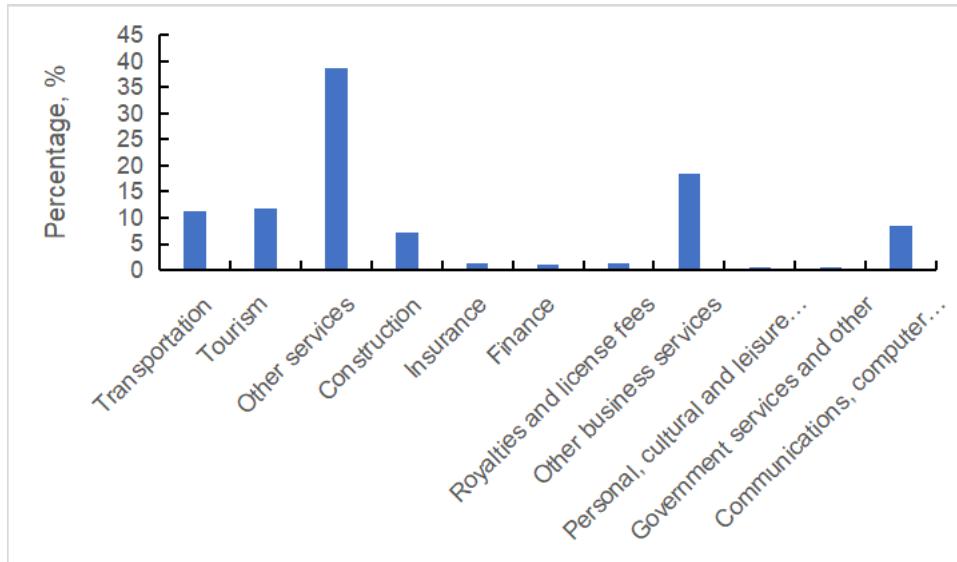
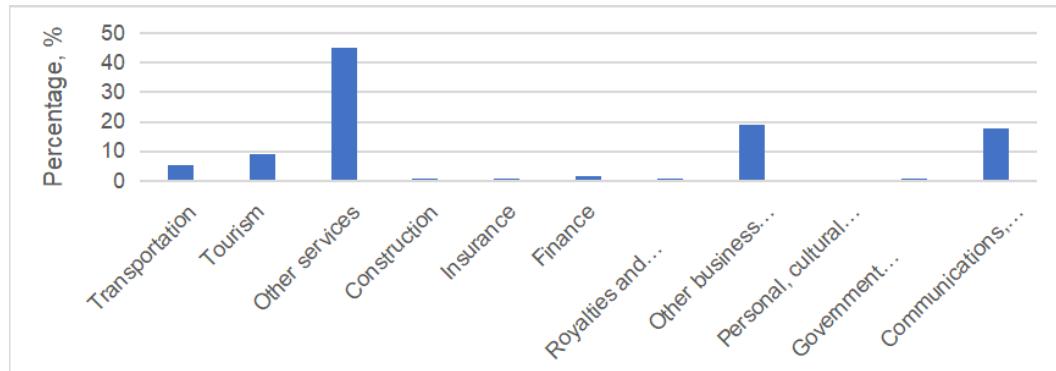


Figure 5. The composition of India's service export categories in 2017

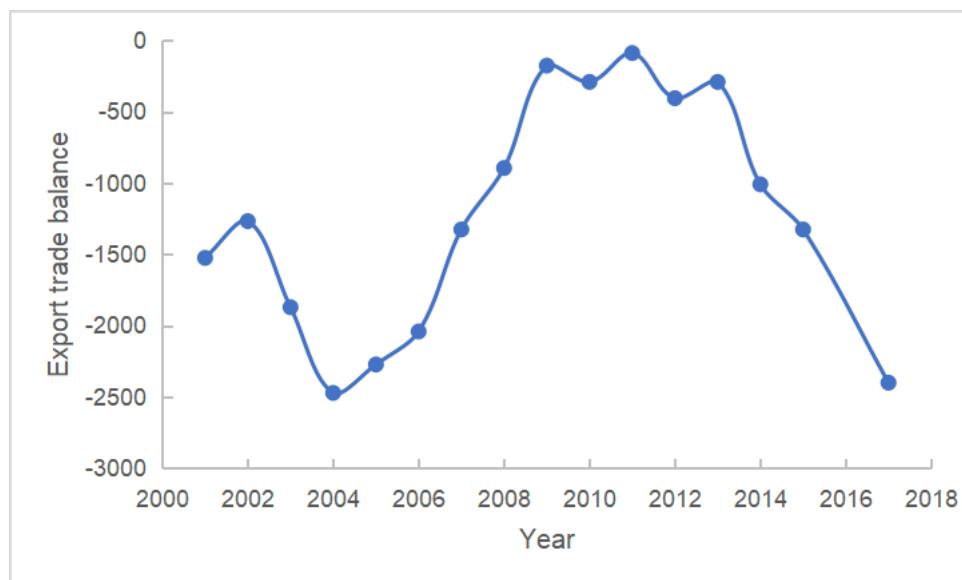


Moderately Affluent Developed Countries

Figure 7 shows that the logistics service export trend of moderately affluent developed countries is relatively similar. The period from 2001 to 2008 is one of rapid growth in logistics service exports. Germany's total logistics service exports have the fastest growth since 2001. The total export volume increased from US\$20.49 billion to US\$61.068 billion in 2008. The total export volume was very large, followed by Japan, France, the United Kingdom, Singapore, and the Netherlands. In 2009, affected by the financial crisis, the export volume of logistics services declined. Among them, Japan was affected most by the financial crisis.

Figure 8 shows that the logistics service trade in the Netherlands has always maintained a trade surplus and that the trade surplus is constantly growing. Before 2008, the logistics service of the United Kingdom maintained a deficit, and this deficit was gradually decreasing. After 2008, it has been in a surplus. In the early days, Singapore's net exports of logistics services had been fluctuating, and it was not until 2007 that it entered a stable state of net exports. After 2015, the focus of the development of

Figure 6. Changes in U.S. logistics service exports and trade balance



Singapore's service trade has shifted to emerging service industries. Although France has a relatively large total export volume of logistics services, its net export volume has been fluctuating, mainly manifested in a trade deficit. Germany's logistics service exports are relatively large, and the growth rate of its logistics service imports is much higher than its service exports. As a result, its logistics service trade has always maintained a trade deficit trend, and the deficit is increasing year by year. Japan's logistics service trade also maintained a successive year-on-year deficit.

Figure 7. The change trend of logistics service exports in moderately affluent developed countries

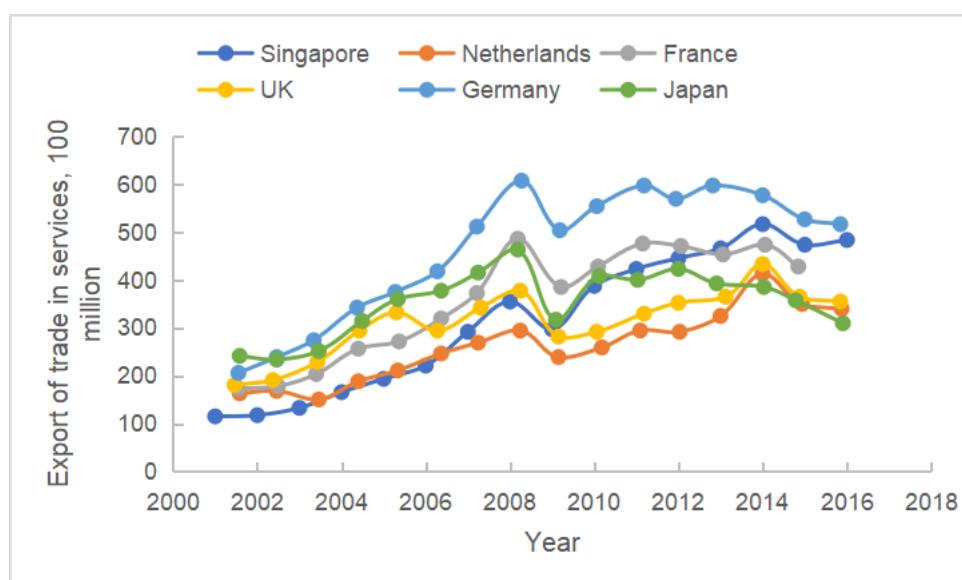
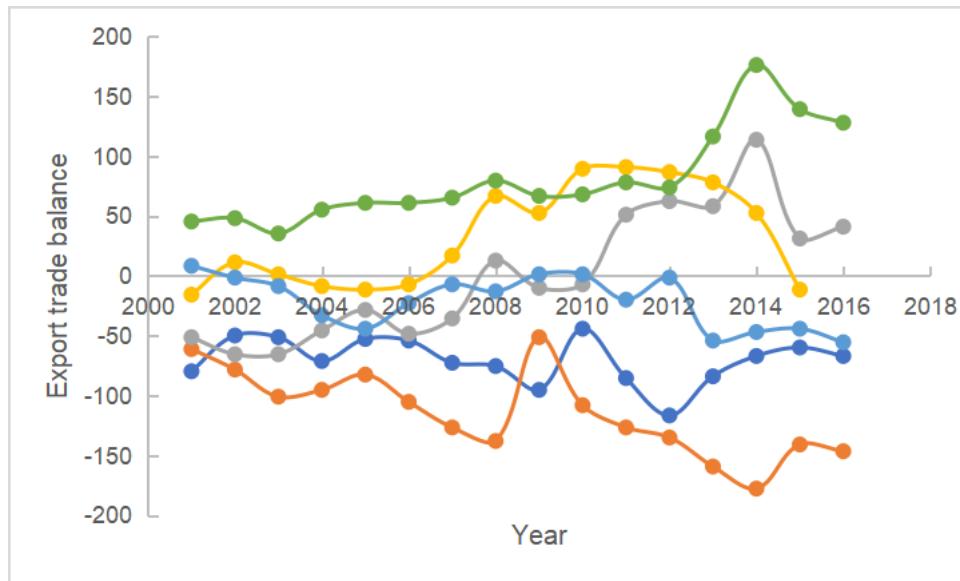


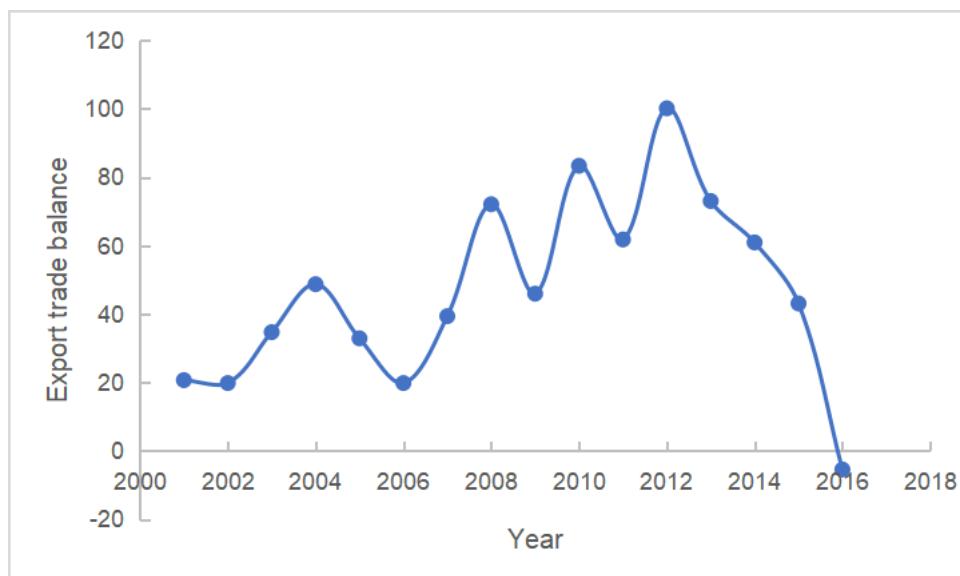
Figure 8. Changes in the balance of logistics service trade in moderately affluent developed countries



Lowly Affluent Developed Countries

The period from 2001 to 2008 was one of rapid growth in South Korea's logistics service exports. In 2009, South Korea's logistics industry was severely affected by the financial crisis, and the export of logistics services experienced a negative growth of 35.8%. South Korea's logistics service exports have always been greater than its logistics service imports, which is represented by a trade surplus (Figure 9).

Figure 9. Changes in the export balance of Korean logistics services



Developing Countries

The external economic environment has affected China's logistics services trade, resulting in a slowdown in the growth rate in recent years. Although the export of logistics services has been growing rapidly year after year, in terms of service quality and efficiency, it is still in a relatively backward state compared with developed countries (Figure 10). Figure 11 shows that India's logistics services have maintained a continuous trade deficit, and the trade deficit has increased year by year, indicating that India mainly relies on foreign logistics companies in the process of trade in goods.

Analysis of Inequality Between Net Exporting Countries and Net Importing Countries

In the context of globalization today, logistics services have become a key support for international trade and economic development. With the continuous extension and complexity of global supply chains, the differences in logistics service demand and supply between different countries are becoming increasingly prominent. However, I have noticed a clear inequality between net exporting and net importing countries in the field of logistics services. This inequality not only affects the balance of economic development but also poses certain challenges to international trade and industrial cooperation. Next, I delve into the causes of this inequality and explore how to promote more equitable and sustainable development in the logistics service sector.

Differentiated Economic Development Level

Net exporters of logistics services are often countries with relatively developed economies, advanced technologies, and a high proportion of service trade. However, net importers of logistics services are relatively backward, with a lower proportion of service trade. The difference in economic development level leads to the differentiation of logistics service capabilities and levels, thereby affecting the division of labor and cooperation in logistics service trade.

Uneven Resource Allocation and Industrial Structure

Net exporting countries of logistics services have high-quality logistics resources and rich logistics service supply chains, whereas net importing countries of logistics services face the dilemma of strong

Figure 10. Changes in China's logistics service export trade balance

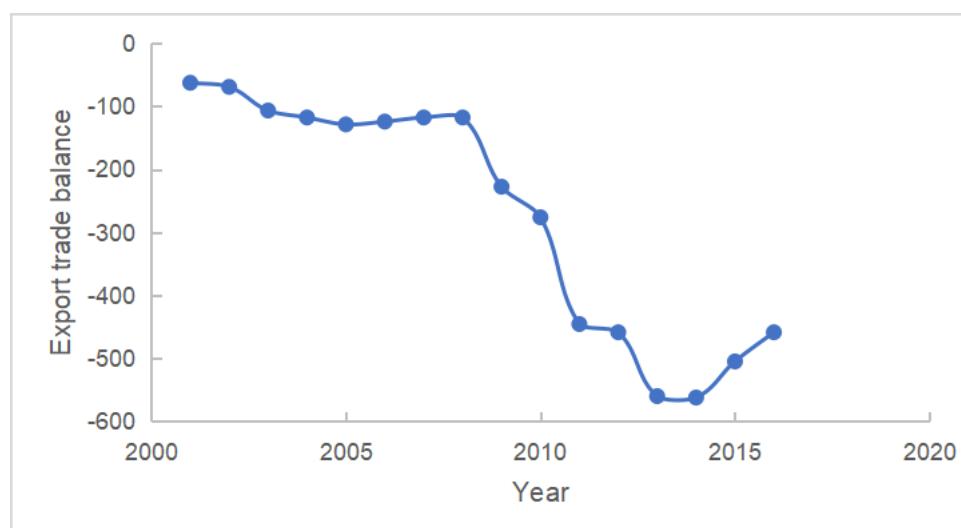
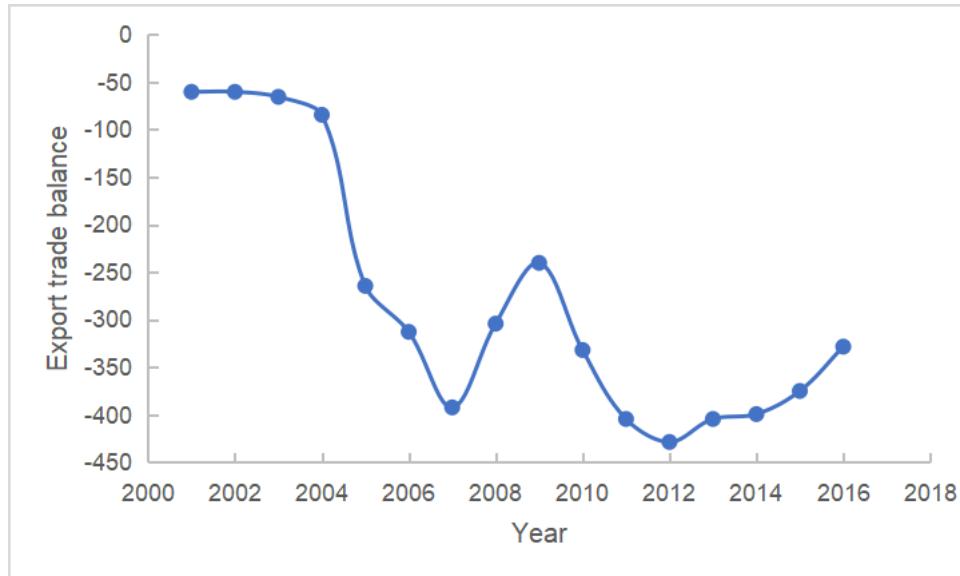


Figure 11. Changes in India's logistics service export trade balance



logistics demand, but relatively insufficient logistics service supply. This imbalance in resources and industrial structure has led to a gap between net exporters and net importers of logistics services.

The Formulation of International Trade Policies and Rules

The formulation of international trade policies and rules is often dominated by net exporters of logistics services internationally. These policies and rules may have a certain impact on the division of labor and cooperation in logistics service trade, further exacerbating the inequality between net exporting and net importing countries of logistics services.

Cultural and Linguistic Differences

Cultural and linguistic differences in different countries and regions may also to some extent affect the division of labor and cooperation in logistics service trade. Therefore, there may be some difficulties in communication efficiency and coordination ability between net exporting and net importing countries in logistics services.

In summary, the inequality between net exporting and net importing countries in logistics services is caused by multiple factors and requires in-depth analysis and exploration from multiple aspects.

To address the inequality between net exporting and net importing countries in logistics services, the following measures can be taken:

- Promoting the liberalization of global logistics service trade. Promoting the liberalization of global logistics service trade, especially by reducing barriers and restrictions of net importing countries in the field of logistics services, can help promote fair competition in the international logistics service market.
- Strengthening cooperation and exchange. Logistics enterprises should strengthen the exchange and cooperation between net exporting and net importing countries of logistics services and promote the balanced development of service trade. For example, cooperation can be carried out in areas such as logistics facility construction, logistics technology innovation, and logistics service supply chain optimization to jointly improve the level and capacity of logistics services.

- Promoting technology and talent development in net importing countries. Logistics enterprises ought to provide appropriate technical and talent training support to net importing countries, help them improve their logistics service level and capabilities, and enhance their competitiveness in logistics service trade.
- Improving the international trade policy environment. Logistics enterprises should focus on improving the international trade policy environment and narrowing the gap between net exporters and net importers of logistics services. For example, when formulating international trade rules and treaties, Logistics enterprises should consider the interests and needs of net importing countries.
- Promoting sustainable development of logistics services. While promoting logistics services, logistics enterprises also need to pay attention to their impact on the environment and society. Therefore, it is necessary to promote the sustainable development of logistics services, strengthen energy and resource conservation and environmental protection, and promote the green, low-carbon, and environmentally friendly development of logistics services.

Evaluation of Coordination Degree of Logistics Service Trade and Ecological Environment Composite System

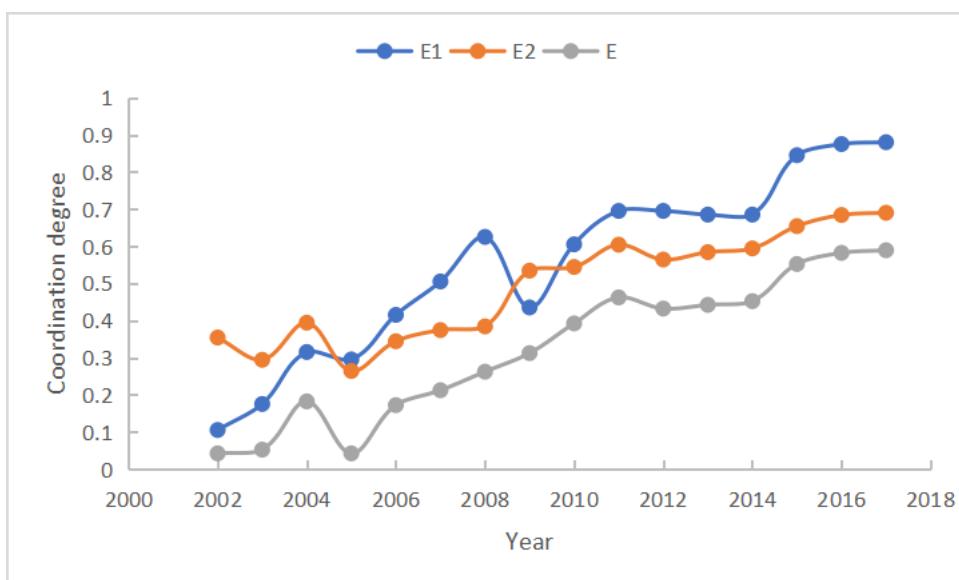
Highly Affluent Developed Countries

Figure 12 reflects the development trend of the order degree of the U.S. logistics service trade subsystem, the order degree of the ecological environment subsystem, and the coordination degree of the composite system over time. The coordination degree of the trade-eco-environment complex system has undergone a qualitative leap—from mild imbalance to barely coordination—and the coordination degree has reached 0.58. From 2001 to 2008, the logistics service export of the United States has been in a steady growth trend.

Moderately Affluent Developed Countries

Figure 13 shows that from 2006 to 2016, the coordinated development of the composite system rose from a period of imbalance to a period of primary coordination, and the coordination degree reached

Figure 12. The coordinated development trend of logistics service trade and ecological environment in the United States



0.63. The average development trend of the composite system in moderately affluent developed countries is similar to that of the United States. At first, the development of logistics service trade lags behind the development of the ecological environment. As the volume of logistics service trade increases, the pollution to the ecological environment will increase. Among the moderately affluent developed countries, Singapore, France, Germany, and the United Kingdom have a higher level of coordination in the composite system. Among them, the logistics service trade between Singapore and the United Kingdom has been in a trade surplus for a long time.

Lowly Affluent Developed Countries

Figure 14 shows that Korea's logistics service trade-ecological environment complex system has roughly gone through three stages: the first stage, is 2002–2006, which is a type of severe imbalance that lags behind the logistics service trade; the second stage is in 2007, which is the synchronous development stage of the logistics service trade and the ecological environment; and the third stage (2008–2016) is a period of lagging imbalance of the ecological environment.

Developing Countries

Figure 15 shows that the coordinated development of China's logistics service trade-ecological environment complex system has roughly gone through three stages: the first stage (2002–2007) was a type of extreme imbalance with a lagging ecological environment; the second stage was 2008–2011, during which the logistics service trade and the ecological environment showed a synchronous development trend, and the coordination degree of the composite system rose from a serious imbalance to a moderate imbalance; the third stage (2012–2016) was a lagging type of logistics service trade.

Figure 16 indicates that the coordinated development of India's logistics service trade-ecological environment complex system has roughly gone through three stages: the first stage, 2002–2006, was a period of extreme imbalance in the lagging logistics service trade; the second stage, 2007–2009, was when the logistics service trade and the ecological environment entered a period of simultaneous development, but the coordination of the composite system at this stage was still in a state of extreme

Figure 13. The coordinated development trend of logistics service trade and ecological environment in moderately affluent developed countries

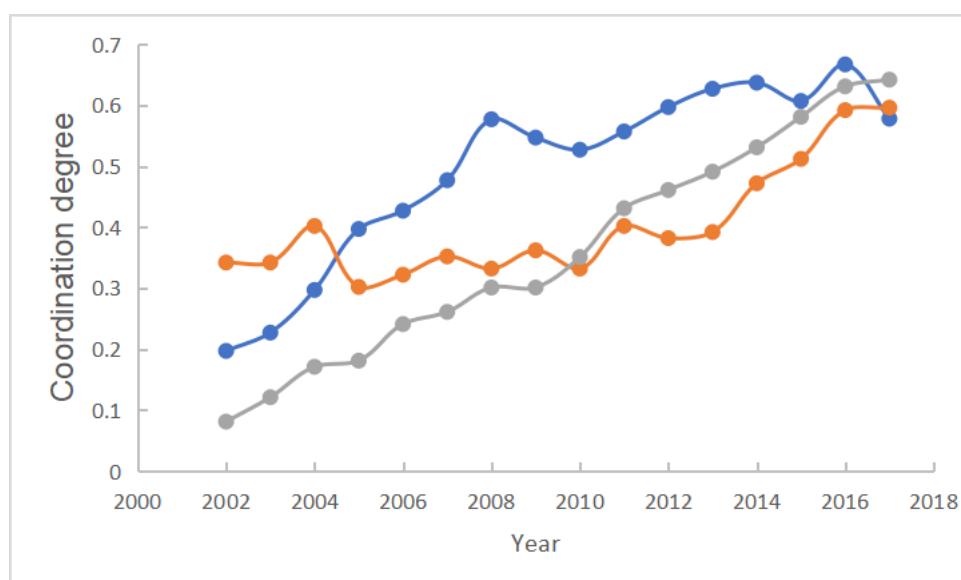
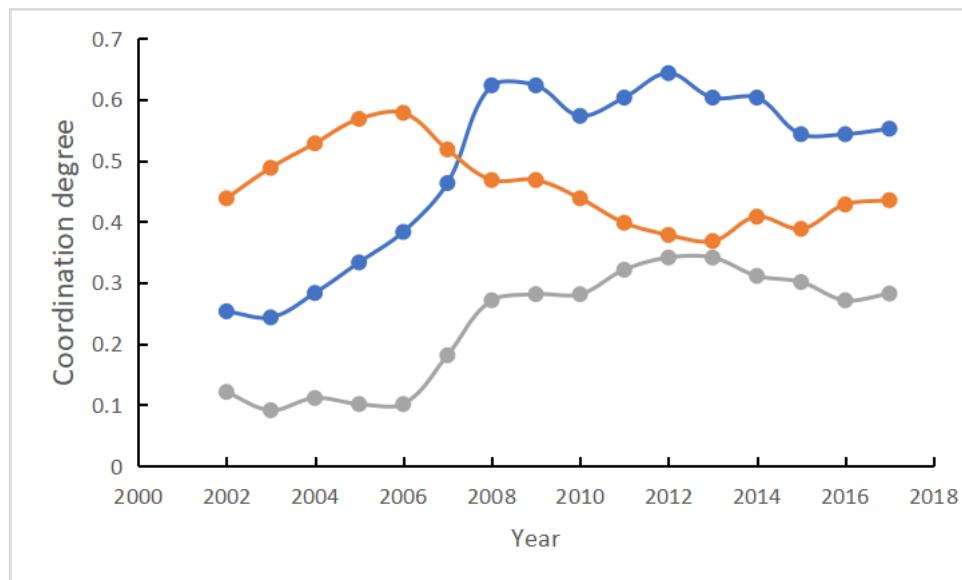


Figure 14. The coordinated development trend of Korea's logistics service trade and the ecological environment

imbalance; the third stage, 2010–2016, was a period of moderate imbalance with a lagging ecological environment.

Analysis of the Development Prospects of Logistics Business in China

In China, a global manufacturing powerhouse and a vast consumer market, the logistics industry plays a crucial role. The advancement of technology and the continuous growth of consumer demand have created unprecedented development opportunities for China's logistics business. However,

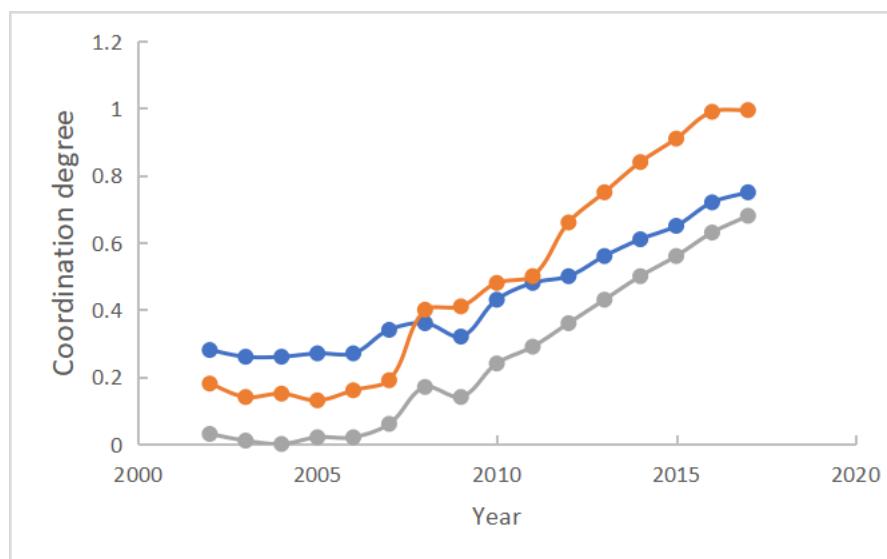
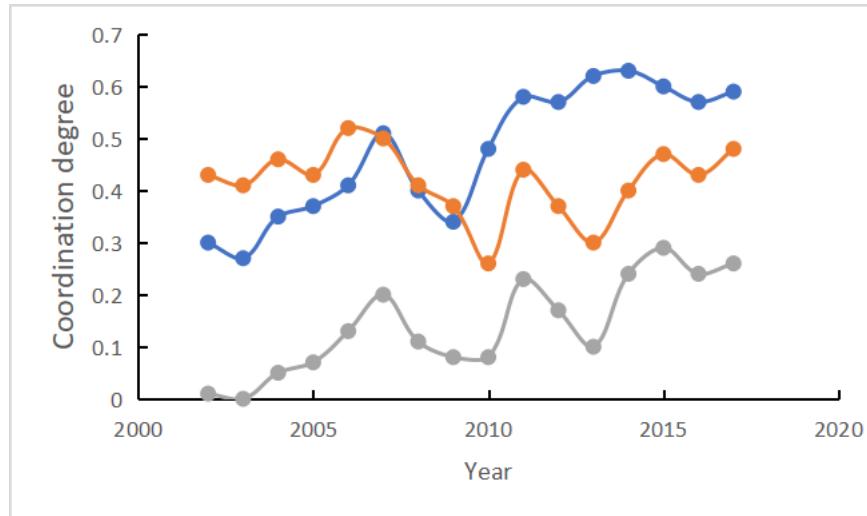
Figure 15. The coordinated development trend of China's logistics service trade and the ecological environment

Figure 16. The coordinated development trend of India's logistics service trade and the ecological environment



it is accompanied by a series of new challenges and risks. In the following sections, I explore the development prospects of China's logistics business, with a focus on discussing the impact of market demand, technological innovation, policy support, and sustainable development on it.

Huge Market Demand

China is one of the world's largest manufacturing and consumer markets. With the advancement of urbanization and the continuous growth of consumer demand, the demand for logistics services will continue to expand, providing huge market opportunities for the logistics industry.

The Rise of E-commerce and Cross-Border Trade

With the rapid development of e-commerce and the increase of cross-border trade, China's logistics business is facing new opportunities and challenges. Logistics companies can meet the rapid delivery needs of e-commerce and cross-border trade by building efficient warehousing and distribution networks.

Technological Innovation and Digital Transformation

The application of new technologies, such as artificial intelligence, big data, and the Internet of Things is changing the way the logistics industry operates. Through digital transformation and intelligent technology application, logistics enterprises can improve transportation efficiency, reduce costs, and provide more personalized and high-quality logistics services.

Policy Support and Reform and Opening Up

The Chinese government has been committed to promoting the development of the logistics industry and has introduced a series of policies and measures to promote innovation and reform in logistics business. For example, promoting the construction of logistics facilities, strengthening the construction of logistics informatization, and optimizing the market environment for logistics services.

Green and Sustainable Development

With the increasing awareness of environmental protection and the popularization of sustainable development concepts, green logistics has become a development trend in the industry. Logistics

companies can achieve the goal of green logistics by reducing energy consumption, optimizing transportation routes, promoting electric vehicles, and other means, and meeting the society's demand for environmentally friendly logistics.

In summary, China's logistics business has broad prospects in market demand, technological innovation, policy support, and sustainable development. Logistics enterprises can seize opportunities, continuously innovate, and improve their service levels to adapt to market changes and achieve sustained and stable development.

Analysis of Countermeasures to Accelerate Transformation

Service trade is one of the fastest-growing and most changing areas in global trade, and it is also one of the key areas for China's future development. To adapt to this trend, China needs to accelerate its transformation and upgrading toward modern service trade. The following key aspects need to be noted:

- Expanding the opening up of the service industry to the outside world. China needs to break down barriers in the service industry, further expand opening up, and attract more service trade enterprises and capital to enter the Chinese market. These measures will help improve the international competitiveness of China's service industry and accelerate its transformation and upgrading.
- Strengthening intellectual property protection. In service trade, intellectual property is crucial. China needs to strengthen intellectual property protection, combat infringement and piracy, provide better protection for intellectual property owners, and attract more knowledge-intensive service trade enterprises to invest and develop.
- Promoting digital transformation. Digital transformation is an important feature of modern service trade. China needs to actively promote digital transformation, accelerate the application of information technology in the service industry, improve the intelligence level and efficiency of service trade, and enhance the international competitiveness of service trade.
- Expanding and strengthening the service trade sector. China needs to increase support for the service trade sector, establish and improve relevant policies and systems, stimulate the development vitality of service trade enterprises, improve the quality and level of service trade, and continuously promote the development of the service trade industry toward high-end, professional, and branded directions.

In summary, China needs to accelerate its transformation and upgrading toward modern service trade through efforts such as expanding opening up, strengthening intellectual property protection, promoting digital transformation, and expanding and strengthening service trade. These measures will help China meet market demand, improve international competitiveness, and achieve sustainable development.

CONCLUSION

At present, the rapid development of usage fees for knowledge- and technology-intensive emerging industries, such as financial services, insurance services, and intellectual property, has dealt a blow to the traditional logistics service trade industry. Highly affluent developed countries (the United States) have already completed the transformation and upgrading toward modern service trade. Developed countries with moderate prosperity are in the primary stage of transitioning from traditional service trade to modern service trade. Low income developed countries (South Korea) still rely on transportation, tourism, and other traditional service trade as their main industries. China is currently in the primary stage of transitioning from traditional service trade to modern service trade.

From the perspective of the total export volume of logistics service trade, the United States has the largest export volume of logistics services. From the perspective of the net exports of logistics services, the Netherlands, Singapore, and South Korea have always been shown as net exporters of logistics services; that is, the exports of logistics services are greater than the imports of logistics services. The United States, Germany, Japan, China, and India have always been shown as net importers of logistics services.

From the perspective of time trends, the coordinated development process of the two subsystems of logistics service trade and ecological environment has certain volatility. Through local alternating rise and fall, the coordination degree of the composite system finally shows a spiral upward trend. From a spatial perspective, the average level of coordinated development of complex systems in moderately affluent developed countries is higher than that of the United States. Compared with Germany and other countries, the logistics service trade in China still has a lot of room for development. This article provides theoretical support for studying the coordination level between regional logistics service trade and ecological environment. In this article I applied the theory of coordinated development to the logistics service industry to expand the research perspective of the logistics service trade industry in exploring the coordinated development between regional logistics service trade and ecological environment. In the future, I can consider studying the development strategies of moderately prosperous developed countries in the field of service trade, exploring the challenges and opportunities they face in their transformation process, and seeking effective policy measures to promote transformation. I can also further explore the impact of logistics service trade on the ecological environment, study how to protect and improve the ecological environment while developing logistics service trade, and promote the coordinated development of the two.

DATA AVAILABILITY

The figures and tables used to support the findings of this study are included in the article.

CONFLICTS OF INTEREST

I declare that I have no conflicts of interest.

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