American Journal of Management Science and Engineering
2022; 7(5): 75-81
http://www.sciencepublishinggroup.com/j/ajmse
doi: 10.11648/j.ajmse.20220705.12
ISSN: 2575-193X (Print); ISSN: 2575-1379 (Online)

Research on the Influencing Factors and Paths of the High-Quality Development of China's Express Industry

Gan Quan[1, 2]

[1]School of Business Administration, Chaohu University, Hefei, China

[2]International College, Christine University, Manila, Philippines

Email address:
happiness_quan@sina.com

To cite this article:
Gan Quan. Research on the Influencing Factors and Paths of the High-Quality Development of China's Express Industry. *American Journal of Management Science and Engineering*. Vol. 7, No. 5, 2022, pp. 75-81. doi: 10.11648/j.ajmse.20220705.12

Received: September 17, 2022; **Accepted**: November 9, 2022; **Published**: November 14, 2022

Abstract: As an important component of the postal industry, the courier industry presents a wide range of industrial fields, absorbing a large number of jobs, high economic added value, significant technical features and other diverse characteristics. It integrates various functions such as information transmission, goods delivery, capital circulation and cultural communication, and involves many fields such as production, circulation, consumption, investment and finance, which is an irreplaceable basic industry in modern society. Therefore, based on the current situation of express industry development, this paper explores the index system affecting express business volume, and selects the national express business income, GDP per capita, fixed asset investment in tertiary industry, total wholesale and retail trade, online shopping transactions, total export trade, total import trade, transportation, storage industry, postal business income, the proportion of urban areas in the resident population, urban The 13 indicators, such as the total mileage of delivery routes, cargo turnover, total road mileage, population density, number of Internet users, etc., are compared by using MATLAB software to find out the key factors affecting the development of the express industry by comparing the gray correlation coefficients, and putting forward policy suggestions to promote the regional development of the express industry in order to provide reference for the development of the national express industry. The results of the correlation coefficients were obtained through the grey correlation coefficient comparison.

Keywords: Grey Correlation Model, Express Industry, Influencing Factors, High-Quality Development

1. Introduction

Nowadays, the development of e-commerce and other Internet retail businesses has promoted the continuous improvement of the scale and development quality of China's express industry, which has become one of the fastest growing industries in China. In addition, national attention and policy support have opened a new era for the development of China's express industry. In 2021, the cumulative total revenue of express business across the country will exceed one trillion yuan, up to 1040 billion yuan, an increase of 18% year on year. The national express business volume has also achieved a breakthrough of 100 billion pieces, reaching 108.3 billion pieces, ranking first in the world for eight consecutive years, and contributing more than half of the global market growth. It is estimated that by 2025, China's express business volume will exceed 150 billion pieces. On the whole, the business volume of the express industry is still in a fast growth range, and the business income is increasing year by year. The express industry will maintain a high profile in the future, and gradually form an express service brand. In view of this, the influencing factors of express business volume shall be weighed correctly, and a comprehensive indicator system affecting express demand shall be established. It is expected to provide intellectual support and technical support for accurate prediction of high-quality development demand of China's express market.

2. Literature Review

The research on express delivery business volume started in the 1960s, earlier than that in foreign countries, and has a wide research scope. Representative literature views focus on: Choi (2011) first studied the impact of modern port logistics loading and unloading efficiency, and reached the conclusion that strengthening comprehensive logistics supervision is conducive to improving logistics efficiency [1]. Reiner (2013) used the DEA

method to measure the logistics efficiency, and made an objective analysis on the impact of each part of the logistics transportation process on the logistics efficiency of dairy warehousing in central Europe [2]. Hayadhi (2014) focused on discussing the factors influencing the development of the express industry by comparing the express operators, network expansion, consumers and other aspects of China and Japan [3]. Zou Shuqi (2014) summarized three main factors affecting the development of China's express industry through multiple regression analysis, namely, Internet development factors, import and export trade factors and economic conditions factors [4], providing reference for countermeasures and suggestions. Shang Fengrui et al. (2016), based on the typical characteristics of the short cycle and long trend of the national express business, proposed to use SARIMA model to fit and analyze the data, accurately predict the express business volume in China, and achieve the desired effect [5]. Shi Yongmei (2018) once again used the method of econometric analysis to discuss the main factors affecting the express business volume by determining multiple variables such as commodity sales, business outlets, total goods, number of Internet users, and increase in light industry, and put forward valuable policy recommendations [6]. Li Shuqin (2020) In a word, the views of the above scholars on influencing factors and data fitting of express business volume also provide effective solutions for accurate prediction of express business volume in China [7].

To sum up, many scholars at home and abroad have made qualitative and quantitative studies on the factors affecting the development of the express industry, forming a series of application achievements and unique values, which have high theoretical research value and practical guiding significance. Foreign scholars mainly focus on exploring the influencing factors of the development of the express industry through technology and methods, while domestic scholars mostly use mathematical statistics and analysis methods to explore the influencing factors of the accumulated total income of China's express business in combination with the development status of local express industry, and the research scope is mainly concentrated in a central region of China, with relatively little research on the whole country. Therefore, this paper chooses the national express business volume as the research object, Based on the real data from 2012 to 2020, this paper explores the correlation between the national express business volume and the influencing factors, and constructs a scientific indicator evaluation system to provide a reference for the development of the national express industry.

3. An Empirical Analysis of the Grey Correlation between the National Express Delivery Volume and Relevant Indicators

3.1. Data Source and Indicator System Construction

In order to do a good job in the gray correlation analysis between the national express delivery volume and relevant indicators, this paper selects the total cumulative income of the national express delivery business, the per capita GDP, the total investment in fixed assets of the tertiary industry, the total retail sales of goods in the wholesale and retail industries, online shopping transactions, total export trade, total import trade, the proportion of urbanization population in the permanent population, the total mileage of urban road network delivery routes There are 13 main indicators, including the turnover of goods transported by various means of transport, the total mileage of national highways, the number of residents per unit land area, and the number of Internet broadband users. These indicators are true and effective, and can be used as the main statistical variables to measure the development of the express business volume across the country, and better fit the real data. The basic data used in this study are all from the China Statistical Yearbook from 2013 to 2021. See Table 1 for details.

Table 1. *National express delivery volume and relevant statistical indicators from 2012 to 2020.*

Annual	Express business volume (10 billion pieces)	Total accumulated income of express business (10 billion yuan)	Per capita GDP (10 billion yuan)	Fixed asset investment in the tertiary industry (10 billion yuan)	Total retail sales of commodities in wholesale and retail industry (10 billion yuan)	Online shopping transaction volume (10 billion yuan)	Total export volume (10 billion yuan)	Total import trade volume (10 billion yuan)	Proportion of urbanization in permanent population (%)	Total mileage of delivery routes of urban road network (10000 km)	Turnover of goods transported by various means of transport (10 billion ton kilometers)	Total mileage of highway (10000 km)	Number of residents per unit land area (10000 person times/km^2)	Number of Internet broadband access users (100 million person times)
2012	0.57	10.55	5385.82	1980.22	4105.33	128.56	1293.6	1148.01	52.57%	132.77	1738.04	423.75	0.23	3.31
2013	0.92	14.42	5929.63	2420.90	4966.04	197.5	1371.31	1210.38	53.73%	128.23	1680.14	435.62	0.24	3.30
2014	1.40	20.45	6435.63	2820.03	5413.20	286.37	1438.84	1203.58	54.77%	143.51	1816.68	446.39	0.24	3.32
2015	2.07	27.70	6888.58	3119.80	5155.68	383.51	1411.67	1043.36	56.1%	137.10	1783.56	457.73	0.24	3.37
2016	3.13	39.74	7463.95	3458.37	5588.78	502.14	1384.19	1049.67	57.35%	147.48	1866.29	469.63	0.24	3.38
2017	4.01	49.57	8320.36	3750.40	6301.81	645.26	1533.09	1247.90	58.52%	162.84	1973.73	477.35	0.25	3.39
2018	5.07	60.38	9192.81	3753.40	6911.62	802.33	1641.28	1408.80	59.58%	171.19	2046.86	484.65	0.25	3.39
2019	6.35	74.98	9908.65	3757.75	7825.18	981.56	1723.74	1432.54	60.6%	221.00	1993.94	501.25	0.26	3.39
2020	8.34	87.95	10159.86	3811.63	8078.36	975.90	1793.43	1423.20	61.4%	232.47	2022.11	519.81	0.28	4.84

Data source: China Statistical Yearbook (2013-2021).

Based on the construction of the scientific and reliable index system that affects the demand of express business nationwide, this paper takes the demand of express business as the reference sequence to reflect the development of express industry, and constructs a three-level scientific index system table that affects the demand of express business nationwide, as shown in Table 2. It can be summarized as follows: (1) The first level indicators objectively reflect the level of economic development: there are specific second level indicators, respectively, the per capita GDP (10 billion yuan), the total investment in fixed assets in the tertiary industry (10 billion yuan), the total retail sales of goods in the wholesale and retail industries (10 billion yuan), online shopping transactions (10 billion yuan), total export trade (10 billion yuan), and total import trade (10 billion yuan); (2) The first level indicators objectively reflect the level of urbanization development: there are specific second level indicators, respectively, the proportion of urbanization population in the permanent population (%), and the total mileage of urban road network delivery routes (10000 km); (3) The first level indicators objectively reflect the fixed infrastructure: there are specific second level indicators, respectively, the turnover of goods transported by various means of transport (10 billion ton kilometers), the total mileage of national roads (10000 kilometers), etc; (4) Level I indicators objectively reflecting human resources: there are specific level II indicators, respectively, the number of residents per unit land area (10000 person times/km^2), the number of Internet broadband access users (100 million person times), etc., which can be used as a comparative series.

Table 2. *Indicator System Affecting Demand for Express Delivery.*

Indicator system	Level I indicators	Secondary indicators
Overall impact index system of express demand	Economic development level	GDP per capita
		Total investment in fixed assets of the tertiary industry
		Total retail sales of commodities in wholesale and retail industries
		Transaction amount of online shopping
		Total export volume
		Total import trade
	Urbanization development level	Proportion of urbanized population in permanent population
		Total mileage of delivery routes of urban road network
	Fixed infrastructure	Turnover of goods transported by various means of transport
		Total mileage of national highways
	Human Resources	Number of residents per unit land area
		Number of Internet broadband access users

3.2. Grey Correlation Analysis Between National Express Delivery Volume and Relevant Indicators

As a classical strategy theory to measure the degree of correlation among various factors, the grey relational system theory intends to find the numerical change relationship among various factors in the system through certain mathematical analysis methods, so as to provide an effective solution for decision-making judgment. It can be said that the grey relational analysis is just right for the analysis of factors affecting the national express volume. Its role is reflected in, on the one hand, the need for systematic analysis and the direct judgment of the importance of factors affecting the development of the system. On the other hand, scientifically rank the advantages and disadvantages of all relevant indicators to ensure correct decision-making [8]. Therefore, this paper uses the gray correlation judgment method to measure the degree of correlation between various relevant indicator factors. Through analysis and comparison, we can understand the degree of similarity or difference in the development trend between various relevant indicator factors, which is called "gray correlation degree" [9]. In the same way, the development of the national express industry system is affected by many factors, with typical gray characteristics. To sum up, it is the most appropriate to use the grey relational analysis method in this paper.

3.2.1. Analysis Process

Combined with the original data of the national express business volume from 2012 to 2020, 13 specific secondary indicators reflecting the economic development level, urbanization development level, fixed infrastructure, human resources and other aspects are taken as the reference sequence for comparison, and the express business volume is taken as the reference sequence. Through the operation of MATLAB R2021a V9.10.0 software, the grey correlation degree is analyzed to obtain the correlation degree values of the relevant indicators. The specific steps are as follows: Step 1: according to the correlation degree calculation formula set by MATLAB software, run the software to calculate the correlation coefficient of each related index from 2012 to 2020. See Table 3 for the calculation results. Step 2: According to the grey correlation degree of each indicator calculated in Table 3 with the express business volume [10], the final ranking of the correlation degree is obtained. See Table 4 for the specific operation results.

Table 3. *Correlation coefficient.*

Annual	2012	2013	2014	2015	2016	2017	2018	2019	2020
Express business volume	1	1	1	1	1	1	1	1	1
Cumulative total revenue of express delivery business	0.9177	0.9281	0.9241	0.9484	0.9741	1.0000	0.9555	0.9271	0.7178
Gross Domestic Product per capita	0.6447	0.6630	0.7055	0.7977	0.9911	0.8429	0.7016	0.5685	0.4174
Total investment in fixed assets in the tertiary sector	0.6749	0.6601	0.6707	0.7314	0.8893	0.9476	0.7067	0.5414	0.4000
Total retail sales of goods in the wholesale and retail industry	0.6486	0.6333	0.6674	0.8165	0.9617	0.8279	0.6858	0.5792	0.4251
Internet online shopping turnover	0.9265	0.9001	0.8748	0.8868	0.9740	0.9601	0.9775	0.9964	0.5926
Total export trade volume	0.5906	0.6141	0.6607	0.7889	0.9139	0.7762	0.6352	0.5126	0.3885
Total import trade volume	0.5711	0.5937	0.6591	0.8641	0.8472	0.7616	0.6492	0.5117	0.3797
Urbanized population as a share of resident population	0.5758	0.6101	0.6685	0.7736	0.9728	0.7668	0.6076	0.4851	0.3678
Total mileage of urban road network delivery routes	0.6107	0.6711	0.7017	0.8638	0.8931	0.7577	0.6143	0.5724	0.4262
Turnover of goods transported by various means of transport	0.5692	0.6225	0.6578	0.7844	0.9781	0.7935	0.6327	0.4894	0.3704
Total national road mileage	0.5797	0.6126	0.6692	0.7740	0.9758	0.7663	0.6062	0.4885	0.3734
Number of inhabitants per unit of land area	0.5725	0.6058	0.6612	0.7829	0.9417	0.7515	0.6014	0.4834	0.3741
Number of subscribers with Internet broadband access	0.5680	0.6092	0.6735	0.7868	0.9370	0.7339	0.5805	0.4639	0.4154

Table 4. *Grey Correlation Degree of Business Volume and Indicators and Specific Ranking.*

Indicators	Relevance	Sort by	Indicators	Relevance	Sort by
Cumulative total revenue of express delivery business	0.9233	1	Share of urbanization in resident population	0.6313	11
Gross Domestic Product per capita	0.6955	3	Total mileage of urban road network delivery routes	0.6617	6
Total investment in fixed assets in the tertiary sector	0.6949	4	Turnover of goods transported by various means of transport	0.6419	8
Total retail sales of goods in the wholesale and retail industry	0.6919	5	Total national road mileage	0.6338	9
Internet online shopping turnover	0.9101	2	Number of inhabitants per unit of land area	0.6259	13
Total export trade volume	0.6425	7	Number of subscribers with Internet broadband access	0.6269	12
Total import trade volume	0.6346	10			

Table 4 shows that the correlation between the business volume and each indicator is above 0.5500. Without considering other factors, it can be judged that the 14 selected indicators are highly correlated with the express business volume. The order of specific relevance degree is as follows: cumulative total income of express business, online shopping transactions, per capita gross domestic product, total investment in fixed assets of the tertiary industry, total retail sales of commodities in the wholesale and retail industry, total mileage of urban road network delivery routes, total export trade, turnover of goods transported by various means of transportation, total mileage of national roads, total import trade, and the proportion of urbanization in the permanent population The number of Internet broadband users and the number of residents per unit land area.

3.2.2. Analysis Conclusion

First, based on the ranking results of correlation degree, it can be seen that e-commerce and express delivery industry are in the upstream and downstream of the value chain of mutually beneficial coexistence, which indicates that among the factors that affect the high-quality development of the express industry, e-commerce and express delivery business have the strongest correlation and the strongest convergence of changes between them, which will inevitably improve our understanding of the express industry [11]. At the same time, the rapid development of the Internet in recent years has promoted the unprecedented prosperity of e-commerce. Mobile payment methods and sound logistics distribution systems have emerged as the times require, greatly improving the speed of high-quality development, with the highest degree of overall relevance.

Second, through the correlation coefficient analysis of the high-quality development of the express industry, it can be seen that the per capita GDP, the total investment in fixed assets of the tertiary industry, and the total wholesale and retail sales have the second largest impact on the express industry. The reason is that the rapid development of the national economy, the wide application of the Internet and the investment in industrial infrastructure has laid a solid foundation for the high-quality development of the express industry. Despite the impact of the global epidemic, China's GDP, total investment in fixed assets in the tertiary industry, and wholesale and retail revenue continue to increase, which will inevitably increase the demand for transportation, warehousing and other businesses in the express industry, and promote the high-quality development of the express industry.

Third, relatively speaking, the proportion of urban population, the number of residents per unit land area, transportation and other indicators have the lowest correlation coefficient value for the high-quality development of the express industry, and have less impact. This situation shows that urbanization is speeding up and rural revitalization is

being steadily promoted. The number of rural Internet users is increasing, and their contribution to the express industry is also rising rapidly. In the era of mobile Internet, the gap between urban and rural areas has been narrowing, the development of township logistics has accelerated, and the penetration rate of rural Internet use has increased [12]. There is little difference between urban and rural areas, indicating that express delivery consumption accounts for a small proportion of urban residents' consumption.

Fourth, the consumption level and consumption structure of Chinese residents are gradually improving. Consumers pay more attention to the service quality and customer experience of express products and the demand for express industry has shifted from basic services to fine services. At the retailer level, the demand for improving the supporting express delivery service capacity and increasing consumer responsibility is increasing, which puts forward higher requirements for the comprehensive service capacity of the express industry, which will accelerate the express industry to enter the stage of high-quality development. Therefore, the express industry needs to improve the service quality on the premise of improving the punctuality guarantee, so as to improve the positive cycle of market share and create a good situation of long-term sustainable development.

4. Analysis of the Path of High-Quality Development of the National Courier Industry in the New Era

4.1. The Background of Big Data and Artificial Intelligence AI, to Pay Full Attention to the Development of E-commerce and Courier Industry Linkage

In the context of the new era, the full use of artificial intelligence and big data technology to bring human convenience has become the main theme of the new era. The development of the courier industry and e-commerce and the two exist together as lips and teeth, complement each other's relationship. From the relevance of e-commerce and courier industry development is not difficult to find, pay attention to e-commerce and courier industry linkage development strategy, is the choice of its high-quality development. It can be said that the courier industry is one of the key elements to determine the development of e-commerce, e-commerce must be supported by express delivery logistics services, building a nationwide, in-depth rural, access to the world's logistics and express delivery operation network, in order to connect the virtual network world with the real world [13].

First, a clear positioning, to fully consider the role of e-commerce is the future development of the left arm of the courier industry, and effectively improve their understanding. Therefore, the "14th Five-Year Plan" period to develop measures to promote the linkage of e-commerce and express industry, coordinated development, and gradually promote the two in the strategy, organization, information and other aspects of synergy and linkage.

Second, promote cooperation between the two sides to extend the service additional links. In the new era, it is necessary to gather logistics advantageous distribution resources, bring into play the core competitive highlights, prefer cooperation with e-commerce enterprises, build business development platforms, extend services, increase added value and improve the efficiency of the whole process of supply chain operation. By signing a strategic cooperation framework agreement between the two sides and building a strategic partnership, the two sides can achieve mutual benefits and win-win cooperation to promote the high-quality development of the industry. In addition, value-added services such as collection of payment and price guarantee can be provided to deepen the deep-level cooperation between the two sides' businesses.

Third, guide e-commerce, express market-oriented cooperation, and strive to achieve "five unities. Through all kinds of subjects to carry out market-oriented cooperation, and constantly promote warehousing, collection, sorting, transportation, distribution, that is, "five unity", in addition, the site, vehicles, personnel, operations, management, that is, "five integration", but also for the development of e-commerce to provide new ideas for development. At the same time, actively encourage rural areas CaiBird post to explore the practice of intelligent logistics, relying on the Internet of Things and other technologies, deepen the digitalization of rural express logistics, intelligent transformation projects.

4.2. Emphasis on Platform Integration, Increasing GDP Per Capita and Empowering High-Quality Development of the Express Industry

The level of GDP per capita is positively correlated with the volume of express business, which directly affects the size of the role of economic support factors on the total cumulative income of express business. The level of GDP per capita has the strongest correlation with the total accumulated revenue of express business, which has a certain degree of far-reaching impact on the development of the express industry. The number of inhabitants per unit of land area has the weakest correlation with the total cumulative revenue of national express business, which to some extent reduces the role of population density (number of inhabitants per unit of land area) factor on the total revenue of express delivery, therefore, the quality development of express delivery industry needs to be integrated with the use of e-commerce, network and other industry platforms. Enterprises should build their own powerful, one-stop website to create a transportation + storage + postal "green" platform [14]. By building a nest to attract phoenixes, joint development and other ways, we can build a hundred years of postal e-commerce "green" platform, realize the integration of online shopping and shipping personalized and customized services, and better serve agriculture, manufacturing and trade, in order to more deeply empower the high-quality development of the courier industry.

4.3. Strengthen Infrastructure Capacity and Service Quality Construction to Help the Express Industry High Standard and High Quality Development

The full development of the courier industry market also provides a strong guarantee for the high quality development of the courier industry. The above-mentioned study shows that the national express industry revenue is generally correlated with the fixed asset investment factor and the number of traffic miles, among which the total investment in fixed assets in the tertiary industry, urban delivery routes, the turnover of goods transported by various means of transportation, the number of road miles and the number of users of Internet broadband access as the infrastructure for the development of the express industry, the construction of which needs to be further broadened at the current stage to further enhance the express industry in China business development [15]. Only by continuously promoting the integration of high-quality logistics and distribution resources, increase the integration efforts, the formation of a strong synergy of the construction of the express industry, for the continuous improvement of e-commerce distribution customer satisfaction to help. Therefore, the following effective measures: First, we must focus on the use of intelligent logistics to improve the timeliness, stability and security of the operation of express parcels, and strive to enhance the operational capacity of the platform to improve service levels; Second, we must make full use of the big data platform to promote the "digital intelligence" upgrade and transformation in the collection, sorting, transportation, fluid processing, delivery and other links Third, we should accelerate the extensive use of logistics information technology in the new era, and apply BarCode (bar code), GIS (Geographic Information System), GPS (Global Positioning System), EDI (Electronic Data Interchange) and ITS (Intelligent Transportation System) technologies to modern logistics, including the continuous promotion of "unmanned warehouse, unmanned aircraft and unmanned vehicles". "Unmanned warehouse, unmanned aircraft, unmanned vehicles" and other technical equipment help the development of e-commerce [16].

5. Conclusion

In recent years, the courier industry as a representative of the new industry, is in the golden period of rapid growth. Despite the downward pressure on the growth rate of China's express industry, the basic pattern of long-term positive express development has not changed. This study uses the gray correlation model to analyze the size of the correlation between the main indicators affecting the high-quality development of China's express industry and the respective volume of express business, and the results of the ranking of the correlation size in turn. The results of the study show that the cumulative total income of express business, online shopping transactions, per capita GDP, total investment in fixed assets in the tertiary industry, and total retail sales of goods in the wholesale and retail industry rank in the top five in terms of the size of the correlation with the volume of express business, which shows that the emphasis on the development of e-commerce and express industry linkage, pay attention to the integration between platforms, strengthen the infrastructure capacity and service quality construction for the realization of the express industry High-quality development, the basic step towards the express power to provide an important reference path.

Acknowledgements

2020, Chaohu University's key construction discipline of business administration (No. kj20zdjsxk01).

2021, Anhui provincial online and offline hybrid course "financial management" (2021xsxxkc194).

References

[1] Choi Y. The efficiency of major ports under logistics risk in Northeast Asia [J]. Asia-Pacific Journal of Operational Research, 2011, 28 (01), pp. 111-123.

[2] Reiner G, Teller C, Kotzab H. Analyzing the Efficient Execution of In-Store Logistics Processes in Grocery Retailing-The Case of Dairy Products [J]. Production and Operations Management, 2013, 22 (4), pp. 924-939.

[3] Hayashi K, Nemoto T, Nakaharai S. The Development of the Parcel Delivery Service and its Regulations in China [J]. Procedia-Social and Behavioral Sciences, 2014, 125, pp. 186-198.

[4] Zou Shuqi, Hou Yunxian. An empirical study on the factors influencing the development of express delivery industry [J]. Modern Trade Industry, 2014, (01), pp. 70-72.

[5] Shang Fengrui, Zhang Jing. Prediction of China's express business volume based on SARIMA model [J]. Modern Economic Information, 2016 (10), pp. 350.

[6] Shi Yongmei. Empirical analysis of factors influencing express business volume [J]. Statistics and Management. 2018, (06).

[7] Li Shuqin. Research on the forecast of express delivery demand in Anhui Province [D]. Hefei University of Technology, 2020.

[8] Xue Rongna, Zhang Mingmin, Nan Yuting, Zhao Huijuan. Daily average courier business volume prediction model based on GRU deep learning algorithm [J]. Statistics and Decision Making. 2021, 37 (13).

[9] Deng Julong. Basic methods of gray systems [M]. Wuhan: Huazhong University of Science and Technology Press, 2002.

[10] Xie Cui, Li L-M. Correlation analysis of green finance development and carbon reduction efficiency of logistics enterprises in the context of carbon neutrality [J]. Business Economics Research. Business Economics Research. 2022, (10), 2002.

[11] Zhang Erli, Kang Dongliang, Gu Lifeng, Ding Lipeng. Development forecast of China's express industry based on GM (1, 1) model for 2019-2024 [J]. Journal of Henan College of Education (Natural Science Edition), 2020, 29 (2): 9-14.

[12] Zhu C-F, Xiao S-Y. Research on China's express business volume based on ARIMA model [J]. Mall Modernization, 2020 (2): 25-27.

[13] Xiao, Len-Lan, Dai, Hou-Ping. Forecasting express business volume in Hunan Province based on GM (1, 1) model [J]. Science and Technology Perspectives, 2020 (17): 63-65.

[14] Wang Lianhua. Gray correlation degree analysis model and its application in China's express delivery industry [J]. Logistics Technology. 2015, Vol. 34, No. 10, pp. 80-82.

[15] Li Fengsheng, Du Dongru, Yan Fangfang. Evaluation of science and technology innovation capacity in Heilongjiang Province - based on gray correlation-TOPSIS method [J]. Times Economic and Trade. 2021, 18 (12), pp. 113-115.

[16] Liu Yisheng, Li Honglei. An empirical study on the development of China's express delivery industry from the perspective of industrial development [J]. Journal of Capital University of Economics and Trade, 2017 (1): 68-72.