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Thoughts and suggestions on building the fulcrum city of modern circulation strategy

Rui Yang*

Department of management, University of the Cordilleras, Baguio city 2600, Philippine

***Corresponding author:** Rui Yang, 3569265350@qq.com

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Abstract: This study explores the development path for Jinan as a modern strategic hub for distribution. In August 2023, Jinan was included in the national plan for 102 strategic hubs for distribution, becoming one of 24 comprehensive hubs. The study employed a comprehensive assessment framework, analyzing infrastructure, operational efficiency, and industrial integration. It found that Jinan faces four major challenges: limited integration into the trunk corridor network and lagging development of sea-rail transport; low operational efficiency of distribution vehicles and outdated infrastructure; an irrational overall transportation structure, with road transport accounting for over 96%; and insufficient integration and linkage of industrial development, with trade and logistics accounting for 60%. The study proposes strategies such as promoting cross-regional integration through integration into trunk corridors; building smart logistics facilities through strengthening the foundation; focusing on four key industries through supply chain reshaping; and leveraging hub economy to drive innovation in the "logistics + platform + trade + industry" model. These strategies aim to promote Jinan's development into a modern distribution hub supporting a dual circulation model.

Keywords: Modern circulation strategic fulcrum city; Hub economy; Supply chain optimization; Multimodal transport

1. Introduction

1.1 Background and Significance

In August 2023, five ministries, including the National Development and Reform Commission, jointly issued the Notice on the Layout and Construction of Modern Circulation Strategic Fulcrum Cities, including 102 cities across the country in the layout of modern circulation strategic fulcrum cities. Among them, Jinan, Beijing, Shanghai, Qingdao and other 24 cities have been selected as comprehensive modern circulation strategic fulcrum cities, which brings great opportunities for Jinan to further promote the "strong provincial capital" strategy construction, fully integrate into the national unified market, and accelerate the cultivation and formation of new quality productivity.Recent research on hub economy efficiency demonstrates the strategic importance of developing circulation fulcrum cities for regional economic integration [1].In order to further promote the construction of Jinan modern circulation strategy fulcrum city, combined with the endowment conditions of Jinan City, it is proposed to integrate into the backbone corridor as the core, strengthen the foundation as the support, supply chain remodeling as the guidance, and hub economy as the drive, and comprehensively promote the cross-regional linkage, the construction of soft and hard infrastructure, the integration of resource factors and the development of transportation and logistics industry. Explore a new path of high-quality urban development of "modern technology + factor aggregation + efficiency improvement + mode innovation".

1.1 Facilitating Better Service and Integration into the New Development Pattern

The key to building a new development pattern in the new era is to smooth the circulation of the national economy. The circulation system connects the two ends of production and consumption, and is the key link and important content of building a new development pattern with the domestic cycle as the main body and the domestic and international cycles promoting each other.The dual circulation strategy represents a fundamental shift in China's development paradigm, emphasizing the mutual reinforcement of domestic and international markets [3]. Building a modern circulation strategic fulcrum city, Jinan can coordinate all aspects of production, supply, storage and marketing in a wider range, and then play a role in improving production efficiency, expanding the scope of transactions, reducing transaction costs, and promoting regional division of labor, helping to create a strategic node of domestic circulation and a strategic hub of domestic and international double circulation.

1.2 Accelerating the Cultivation and Formation of New Quality

Productive Forces

At present, the most significant feature of local development is that incremental demand has entered a period of low-speed growth, and the driving force of economic development has changed from incremental to stock-based.China's logistics evolution demonstrates how modern circulation systems catalyze economic transformation and productivity enhancement [8]. To speed up the formation of new quality productive forces, economic development must have modern characteristics and meet the requirements of a modern industrial system. A modern circulation system is not only an important basis for high-quality economic development, but also an integral part of development model innovation. Jinan builds a fulcrum city of modern circulation strategy, and promotes the reconstruction of industrial chain and the re-organization of industrial space through supply and demand adaptation, which can promote the transformation of the city from the cost-based competitive expansion dominated by increment in the past to the value-based creation and development dominated by stock, and form a new quality productivity supporting the high-quality development of Jinan.

1.3 Exploring New Paths for High-quality Urban Development

High-quality urban development must be built on the basis of ensuring the cost competitiveness advantage of the supply chain and the ability to radiate the scope of the advantages, the formation of these advantages is an important basis for the construction of modern circulation system, promote the industrial division of labor structure from the deep division of labor within the product to the chain flat development, comparative cost advantage to the whole chain cost advantage.Smart city construction has proven effective in promoting urban green development and sustainable growth patterns [9]. The construction of a modern circulation strategic fulcrum city in Jinan helps to create a channel environment with cost competitiveness, improve economic operation efficiency and regional economic organization status, and explore a new path of high-quality urban development of "modern technology + factor aggregation + efficiency improvement + mode innovation".

2. Methods

This analysis employs a comprehensive assessment framework examining Jinan's circulation system development from multiple dimensions. The methodology integrates evaluation of physical infrastructure (transportation networks, logistics facilities, hub carriers), operational efficiency metrics (freight volume distribution, modal split ratios, cargo handling capacities), and industrial integration patterns (logistics-manufacturing linkages, supply chain coordination mechanisms).

Comparative analysis with other strategic fulcrum cities provides benchmarks for identifying development gaps and best practices, particularly examining successful models from Chongqing, Chengdu, Shenyang, and Jinzhou in multimodal transport network construction and land-sea channel development. Recent studies on international multimodal transport connectivity provide valuable methodological insights for assessing Jinan's integration into global logistics networks [2]. The assessment combines quantitative indicators with qualitative factors including policy environment, regional cooperation frameworks, and market dynamics to comprehensively evaluate Jinan's current status and strategic development potential within the national circulation system architecture.

3. Results

3.1 Current Challenges and Problems

3.1.1 Integration into the Trunk Channel Network is Not Deep

Chongqing, Chengdu and other cities rely on the construction of new land and sea channels in the west, multimodal transport has been upgraded from "one line" to "one network"; Cities such as Shenyang and Jinzhou are also building new land and sea routes in the northeast. Research indicates that multimodal transport significantly impacts both domestic circulation and international connectivity, serving as a crucial lever for logistics industry upgrading [4]. In recent years, although Jinan has opened rail and sea trains, it is still in a simple point-to-point direct route with few lines, small cargo volume and low frequency density, and has not formed a hub-to-hub multimodal transport trunk network. The comprehensive transportation advantages of location have not yet been transformed into channel competitive advantages and hub economic advantages.

3.1.2 Circulation Carrier Operation Efficiency is Not High

From the perspective of hub carrier, most of Jinan railway freight station, except Dongjia Station, were built in the 1980s, and the ability of single support and resource integration is weak. Sustainable logistics development trends in major Chinese cities highlight the importance of modernizing infrastructure and improving operational efficiency [6]. The cargo handling capacity of Jinan International Airport is less than 200,000 tons; The construction of the network between "iron air water" hubs in the international dry port area needs to be improved. From the perspective of logistics parks, there are more traditional highway freight parks and less production service

and comprehensive logistics parks. Low-level construction and disorderly expansion are more serious, and some logistics agglomeration areas mainly lease collective land in villages and towns, old factories, freight stations, etc., and problems such as simple facilities and dirty and poor are more prominent.

3.1.3 Unreasonable Comprehensive Transportation Structure

Comprehensive transportation is the cornerstone of circulation fulcrum city construction. At present, Jinan over-relies on roads for cargo transportation, which accounts for more than 96% of the total social freight volume, higher than the national average; Rail transport accounts for about 3%, lower than the national average; Water and air transport accounted for about 0.2% and 0.06% respectively, accounting for a significantly smaller proportion. Taking railway traffic as an example, Jinan railway cargo delivery volume only accounts for about 2.2% of the National Railway Jinan Bureau, the main reason is that there are fewer large industrial enterprises in Jinan City, insufficient support for endogenous goods, and the advantages of railway cargo collection are not prominent enough.

3.1.4 Insufficient Integration and Linkage of Industrial Development

Jinan circulation economy is generally in the stage of passive service and follow-up development. From the perspective of logistics industrial structure, the city's commercial logistics accounted for the largest proportion, more than 60%; Industrial logistics accounted for about 30%, far lower than the province's average level of more than 70%. From the perspective of market players, there are 336 logistics enterprises in the city, accounting for only 3% of the total number of logistics enterprises in the city, and there are fewer large-scale integrated logistics enterprises that can promote industrial integration and linkage and have core competitiveness.

3.2 Strategic Countermeasures and Suggestions

3.2.1 Cross-regional Linkage with Backbone Corridor Integration as Core

To promote circulation function is to rely on the cooperation mechanism of the national logistics hub and the national backbone cold chain logistics base to strengthen cooperation with other circulation fulcrum cities, actively participate in the construction of various important commodity and resource elements of the backbone circulation corridor, and establish a docking mechanism with the cities along the Jinlu

coal backbone circulation corridor. Global logistics and supply chain integration in the digital era, particularly through initiatives like the Belt and Road, provides models for cross-regional cooperation [5]. The second is to deepen the construction of green smart logistics collaborative innovation center (alliance) along the Yellow River Central City, strengthen the logistics collaborative development with Zhengzhou, Xi'an and other cities along the Yellow River Central City, and promote the joint construction and sharing of key logistics parks, transportation enterprises, and urban agglomeration freight hubs and facilities. The third is to promote the construction of Jinan and Linyi national comprehensive freight hubs to strengthen the chain, lay out and build a number of comprehensive freight hubs, efficiently connect the main producing areas, distribution centers and consumption areas of agricultural products and industrial products, and build a multi-level, integrated and coordinated comprehensive freight hub system of Jilin and twin cities. Fourth, actively build freight corridors with neighboring cities, plan and build special freight corridors serving important hubs and parks, build a modern interconnected logistics network, and promote the two-way flow and efficient allocation of resource factors.

3.2.2 Infrastructure Construction with Strong Foundation as Breakthrough

First, accelerate the construction of new infrastructure in the field of circulation, combined with the application of a new generation of information technology, accelerate the data and information of circulation elements such as goods and terminals, layout and construction of smart ports, smart parks, smart storage bases and other facilities, improve the intelligent level of transportation infrastructure, and support the "channel + hub + network circulation organization and service model innovation." Digital supply chain technologies, including IoT, big data, blockchain, and AI, are revolutionizing logistics infrastructure and operations [7]. The second is to improve the hub collection and distribution capacity: accelerate the implementation of the interconnection project in the core area of Jinan inland port, plan the construction of special railway lines and expressways from Dongjia Railway freight Center to Xiaoqinghe main city port area, vigorously develop multimodal transport, and build a multimodal transport demonstration base. The third is to accelerate the construction of the Guo-Da railway connection line, open up the transportation channel between Wa-ri Railway and Laiwu area, make full use of the circulation advantage of Wa-ri Railway to connect high-quality coal resources along the line, and open up a convenient channel for high-quality coal resources from Shanxi, Shaanxi and Mongolia to Shandong. We will strengthen connectivity with Tianjin Port, Qingdao Port and other ports, and build a multi-channel maritime transport system by rail, water and road.

3.2.3 Resource Factor Integration with Supply Chain Reshaping as Guide

First, focus on the city's four leading industries of big data and new generation information technology, intelligent manufacturing and high-end equipment, fine steel and advanced materials, biomedicine and great health, promote the linkage development of circulation and industry and cross-border integration, promote the overall planning and coordinated promotion of production, wholesale, transportation and sales, improve the overall competitive advantage of the supply chain, and build a national important supply chain management service center. The digital economy enhances supply chain resilience through government innovation-driven policies and technological advancement [10]. The second is to upgrade the "Jinan Industrial Product Information Platform", regularly publish the "Jinan Advantageous Product Promotion Catalogue", actively promote the use of Jinan local advantageous products in government investment projects, financial capital procurement, state-owned enterprises and institutions procurement, and government-led infrastructure, public products and public welfare project construction, to accelerate the release of enterprise production capacity. The third is to guide and promote Inspur, Sinotruk and other leading backbone enterprises to open up supply chain resources and market channels, share technology platforms for the whole industrial chain, provide industry and product solutions, and drive upstream and downstream smes to share resources, joint research and development, and business collaboration.

3.2.4 Hub Economy Development as Driver

First, give play to the leading role of transportation support, innovate the operation mode of "logistics + platform + trade + industry", bring together people, logistics, business flow, information flow and capital flow, and build a regional logistics center and trade center. Second, relying on the Beijing-Shanghai transportation channel, Jinan transportation hub should strengthen its two-way gathering radiation energy, developed commercial circulation industry and logistics system, and promote its comprehensive advantages such as sound and convenient external transportation with Beijing, Shanghai and along the line. We have the conditions and ability to solve the problems of low circulation efficiency, high circulation cost, industrial integration, industrial transfer and industrial cooperation, and explore the development of a new model of circulation economy between Beijing and Shanghai. Through coordinating cross-regional linkage, soft and hard infrastructure construction, resource element allocation, and hub economic development, we can build a modern circulation network with internal and external connectivity, explore a new path of high-quality urban development of "modern technology + factor aggregation + efficiency improvement + mode innovation", and better serve the modern industrial system supported by the real economy. Third, strengthen the linkage between Jinan and Qingdao, comprehensively enhance the combined advantages of Jinan dry port and Qingdao seaport to promote the linkage development of land and sea, and form an international and domestic two-way radiation circulation economic corridor supported by cities and towns along the line. Fourth, based on the strategic opportunity of the

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establishment of Jinan metropolitan area approved by the State, we should strengthen the in-depth division of labor and cooperation between Jinan and surrounding towns, build a multi-level rapid transportation network that effectively connects large, medium and small cities and small towns, and actively explore new models of cross-regional cooperation such as “remote incubation”, “two-way enclaves” and “co-managed parks”. To build a focused, hierarchical, and resilient metropolitan area modern industrial system.

4. Discussion

Jinan’s construction as a modern circulation strategic fulcrum city requires comprehensive strategies addressing structural challenges through cross-regional collaboration, infrastructure modernization, supply chain optimization, and hub economy development. The integration of advanced logistics infrastructure with multimodal transport systems positions Jinan as a pivotal node in national and international circulation networks. This transformation necessitates coordinated efforts among government agencies, enterprises, and research institutions to establish a modern circulation ecosystem characterized by technological innovation, operational efficiency, and business model innovation, supporting the dual circulation pattern and fostering sustainable high-quality urban development.

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