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Research on Cross-Border E-commerce Logistics Channel Selection Strategies

XiaJie Chen

College of Economics and Management, Southwest Petroleum University, Chengdu 610500, China

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***Corresponding Author:** XiaJie Chen

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Abstract **Original Research Article**

Cross-border e-commerce, as a pivotal business model emerging from the Internet era, has become a key driver of global trade growth. The selection of logistics channels for cross-border e-commerce not only affects the transportation efficiency of goods but also has a direct impact on the customer shopping experience and the seller's cost control. An effective logistics strategy can not only enhance customer satisfaction but also provide cross-border e-commerce enterprises with a competitive advantage in highly competitive markets. However, small and medium-sized enterprises (SMEs) are the primary actors in trade; due to their relatively decentralized nature, they often lack the sufficient resources to independently establish a comprehensive logistics and distribution system. Furthermore, SMEs typically have smaller cross-border e-commerce turnover, placing greater demands on logistics safety and speed. Consequently, determining how to select the appropriate logistics channel based on their specific circumstances has become a critical challenge for cross-border e-commerce enterprises.This paper aims to conduct a systematic study of the types, characteristics, and selection strategies for cross-border e-commerce logistics channels, providing cross-border e-commerce enterprises—particularly small and medium-sized enterprises—with a scientific basis for decision-making. The findings of this study hold significant theoretical and practical importance for enhancing the logistics efficiency of cross-border e-commerce, reducing logistics costs, improving customer satisfaction, and promoting the healthy development of China's cross-border e-commerce sector.

Keywords: Cross-border e-commerce, e-commerce logistics, channel selection.

1. Overview of Cross-Border E-commerce Logistics

Cross-border e-commerce logistics refers to integrated services provided for cross-border e-commerce activities, encompassing product transportation, warehousing, distribution, customs clearance, and payment, spanning from sellers to overseas buyers. Cross-border e-commerce logistics exhibits the following distinct characteristics:

(1) Complexity of operational stages: Cross-border e-commerce logistics involves multiple complex processes—including international transportation, cross-border customs clearance, multilingual processing, and currency exchange settlement—characterized by cumbersome procedures and numerous uncertain factors. Due to the extensive number of stages involved in cross-border logistics, various forms have emerged at different levels; for example, initial customs clearance can be categorized into sea freight, land transport, air freight, dedicated express lines, among others.

(2) High operational risks: Cross-border e-commerce involves long logistics distances and numerous operational steps, exposing businesses to risks such as cargo loss, damage, delays, and returns or exchanges; furthermore, the party responsible for bearing these risks is often unclear, making dispute resolution particularly challenging. For example, small postal packages frequently experience cargo loss during the delivery process.

(3) High cost: Cross-border e-commerce logistics costs typically encompass various components such as transportation fees, customs duties, warehousing fees, and operational fees, with the overall cost being significantly higher than that of domestic logistics. Taking DHL as an example, shipping 1 kilogram of goods from China to the United States takes approximately 5 days and costs about 60 RMB; for weights exceeding this amount, additional fees will be charged.

(4) Temporal uncertainty: Due to factors such as customs clearance efficiency, transportation conditions, and weather conditions, the timeliness of cross-border e-commerce logistics cannot be absolutely guaranteed. For postal parcels, it typically takes between 15 and 30 days to deliver the goods to their designated destination.

(5) High demand for logistics informatization: Cross-border e-commerce requires coordination across multiple countries, resulting in highly complex logistics networks; therefore, it must rely on highly informatized systems—including order management, shipment tracking, customs clearance systems, and delivery status monitoring—to achieve full-process transparency and controllability.

2. Analysis of Key Logistics Channel Models for Cross-Border E-commerce

2.1 Postal Small Parcel Model

Postal small parcel services are currently the most widely adopted logistics model among cross-border sellers. As of October 2023, the Universal Postal Union (UPU) comprises 192 member states; under the UPU's framework, postal parcels offer affordable pricing and extensive coverage. The process for postal small parcels is relatively straightforward: cross-border e-commerce sellers simply need to attach an airway bill, a customs declaration form, the recipient's address, and the registered mail number to the package to ship the goods to the buyer.

However, postal small parcels also have several notable drawbacks: on one hand, their delivery timeliness is highly unstable—deliveries via European and American routes typically take 10–30 days, while in remote areas, this period may exceed 30 days, and delivery times are significantly affected by factors such as customs inspections and holidays; on the other hand, the loss rate is relatively high, particularly since standard postal small parcels lack an effective logistics tracking system, thereby increasing the risk of lost or damaged goods. Additionally, postal small parcels impose strict cargo restrictions, generally limiting weight to no more than 2 kg and specifying clear maximum size limits, making them unsuitable for transporting large items or products with special shapes.

For cross-border e-commerce sellers who are just starting out or have a small order volume, postal small parcels offer a relatively ideal starting point due to their low cost and simple operational process. However, for high-value products, those with time-sensitive requirements, or those that require a premium shopping experience, postal small parcels may not be the optimal choice.

2.2 International Express Delivery Model

International express delivery services are primarily provided by major multinational logistics companies such as DHL, UPS, FedEx, and TNT, which offer "door-to-door" full-chain closed-loop services and achieve high-efficiency transportation by leveraging their own cargo aircraft and distribution networks. The core strengths of international express delivery lie in its timeliness and reliability: for mainstream routes between Europe and North America, delivery typically takes 3–5 days; for certain urgent shipments, expedited delivery within 1–2 days is possible, significantly reducing cross-border transit time. Additionally, these services provide comprehensive real-time tracking throughout the entire process, with logistics node information synchronized in real time, enabling sellers and

buyers to stay fully informed about shipment status at any time. Furthermore, international express delivery providers possess strong customs clearance capabilities, featuring professional teams to handle customs clearance procedures, along with rapid response times for handling abnormal shipments.

The primary disadvantage of international express delivery services lies in their high costs. Their fees typically range from 5 to 10 times those of standard postal small parcels, and they often involve various additional charges (such as fuel surcharges, remote area surcharges, oversized item surcharges, etc.), all of which significantly increase the total logistics cost. Additionally, international express delivery imposes strict cargo restrictions: highly sensitive items such as pure liquids, powders, or counterfeit goods are generally not eligible for shipment, and the weight per package is usually limited to no more than 70 kilograms.

2.3 Dedicated Line Logistics Model

Specialized logistics services refer to direct routes established for specific countries or regions; after the customs clearance process for the initial leg of the shipment is completed, a partner company handles the delivery to the destination country. The advantages of specialized logistics lie in its ability to consolidate large volumes of goods for transport, where economies of scale can reduce costs, resulting in lower prices; in terms of delivery speed, it is slower than commercial express services but better than postal small parcels.

Specialized logistics services primarily fall into two categories: first, dedicated line services provided by international logistics enterprises; and second, dedicated line logistics services provided by cross-border e-commerce platform operators. Taking Rusutong as an example, it has taken on the logistics responsibilities for China–Russia e-commerce trade, demonstrating a high level of professionalism in both customs clearance and the coordination of various logistics stages.

The primary limitation of dedicated logistics services is their relatively narrow coverage area, currently focusing mainly on traditional markets in Europe and America as well as specific emerging markets such as Russia. Additionally, the service quality of dedicated logistics services depends largely on the capabilities and efficiency of local partners.

2.4 Overseas Warehouse Model

An overseas warehouse refers to a storage facility pre-established by cross-border sellers in the country or region of their target market; by shipping goods to these warehouses in advance, cross-border sellers can achieve rapid local delivery and reduce costs. Overseas warehousing primarily encompasses three typical models: self-built warehouses by the seller, third-party managed overseas warehouses, and self-built warehouses by e-commerce platforms.

The primary advantages of overseas warehouses are as follows: First, they significantly improve delivery efficiency—customers can have their orders shipped directly from local warehouses, thereby drastically reducing transit time; second, they lower logistics costs by leveraging large-scale transportation and localized distribution, which reduces the logistics expenses associated with individual orders; third, they enhance customer satisfaction, as fast delivery services and convenient return and exchange procedures can substantially improve the overall shopping experience.

However, overseas warehouses also entail certain challenges: they require advance stock preparation, involve significant inventory pressure, and demand high accuracy in sales forecasts. Additionally, operating overseas warehouses imposes high requirements on a company's financial strength, inventory management capabilities, and understanding of the local market.

3. Key influencing factors in the selection of cross-border e-commerce logistics channels

3.1 Product characteristic factors

The inherent characteristics of the goods themselves constitute the primary consideration when selecting a logistics channel. Different types of goods have varying requirements for logistics services, which are primarily reflected in the following aspects:

The weight and volume of goods have a significant impact on logistics costs. For small, lightweight items (such as accessories or small electronic components) that are light (e.g., individual items weighing less than 2 kg) and compact in size, postal small parcels or international express delivery are excellent options. Conversely, for items that are heavier (exceeding 20 kg) or occupy a large volume—such as furniture sets—international sea freight or full container shipping may be more cost-effective choices.

The value of goods directly influences the choice of logistics method. High-value goods (such as high-end electronic products and luxury items) typically have higher requirements for logistics security and timeliness; therefore, international express delivery or overseas warehouse solutions are often more suitable, as they generally offer stronger security measures and faster delivery services during transit. For low-value goods (such as small toys or daily necessities), lower-cost logistics options—such as postal small parcels or dedicated logistics services—may be considered.

The physical properties and susceptibility to damage of goods are also critical considerations. For fragile goods (such as glassware and ceramics), it is essential to select logistics methods with robust packaging and reliable transportation safeguards; in this regard, international express delivery or dedicated logistics services may offer greater advantages. For perishable goods (such as fresh food and flowers), where timeliness is paramount, it is necessary to choose the fastest logistics method, such as international air freight or dedicated logistics services equipped with cold-chain capabilities.

3.2 Target Market Factors

The state of logistics infrastructure in the destination country or region. In regions with well-developed logistics infrastructure—such as Europe and North America—all types of logistics services can operate effectively; international express delivery, dedicated line logistics, and postal small parcels can all be selected flexibly based on the nature of the goods and budget constraints. Conversely, in regions where logistics infrastructure is less developed, it is advisable to choose logistics channels that possess strong operational capabilities locally.

Destination countries often exhibit significant differences in customs clearance policies and tariff rates. Tariff policies vary considerably across different countries; some nations may impose high tariffs or impose strict trade restrictions on specific goods. For example, EU member states have stringent certification and standardization requirements for imported goods; therefore, selecting an experienced international express delivery provider or dedicated logistics service with strong customs clearance capabilities can help mitigate delays caused by customs clearance issues.

The consumption habits and preferences of the destination country also influence logistics choices. For example, in some developed countries, consumers have high expectations for delivery speed and may need to opt for overseas warehouses or international express shipping to meet their needs; whereas in some emerging markets, consumers may not have stringent requirements regarding delivery speed but are price-sensitive, making lower-cost logistics options more suitable.

3.3 Cost Control Factors

Transportation costs constitute a major component of logistics expenses. International express shipping fees are relatively high, while postal small parcel services are comparatively lower; dedicated line logistics and overseas warehouses vary depending on the specific route and warehousing requirements. It is essential to consider the impact of logistics costs on profitability based on the profit margin of the goods and the pricing strategy adopted.

Warehousing costs are particularly critical when considering the overseas warehouse model. If an overseas warehouse is chosen, one must bear warehousing expenses, the capital cost associated with inventory backlog, and potential unsellable risk. The cost-effectiveness of an overseas warehouse should be rationally evaluated based on sales forecasts for the products and the company's inventory management capabilities.

Hidden costs are often overlooked yet can have a

significant impact; these include packaging fees, insurance premiums, customs clearance fees, among others. Certain logistics methods may entail some of these expenses, while others may require additional payments. It is essential to clearly define the composition of each cost item and identify the party responsible for each one to avoid the occurrence of hidden costs.

3.4 Factors affecting logistics service quality

Timeliness is one of the core performance indicators for logistics services. The timeliness of logistics channels is particularly critical for cross-border e-commerce, as it directly impacts customer satisfaction and repeat purchase rates. For products with high timeliness requirements (such as emergency medications or holiday gifts), the fastest logistics method should be selected; whereas for products with moderate timeliness requirements (such as non-urgent clothing or general household items), a logistics method with slightly longer delivery times but lower costs may be chosen.

Reliability and safety are fundamental requirements for logistics services. If an unreliable logistics channel is chosen, it may easily lead to issues such as cargo delays, damage, or loss, thereby adversely affecting customer satisfaction and the company's reputation. Therefore, when selecting a logistics channel, it is essential to choose a logistics provider with high reliability.

The coverage of a service network determines the accessibility of logistics services. If the chosen logistics company does not possess a comprehensive service network, it may easily lead to delays in delivering goods or other issues. Therefore, it is essential to select a logistics company with an extensive service network—particularly one that offers strong coverage in the target market.

3.5 Corporate Internal Factors

Order volume is a critical factor influencing logistics selection. If order volumes are small and scattered, postal small parcels or international express delivery may offer greater flexibility; if order volumes are large and stable, you can negotiate more favorable prices and service terms with dedicated logistics providers or overseas warehouse service providers.

A company's financial strength determines whether it can adopt a logistics model that requires advance payment of costs. Overseas warehouses require pre-ordering goods and upfront payment of warehousing fees, which places high demands on the company's financial capacity. If funding is limited, the company may first opt for a more cost-effective logistics method and consider models such as overseas warehouses only after its financial situation improves.

Logistics management capabilities directly influence a company's ability to manage complex logistics models. Overseas warehouses and dedicated express delivery services require specific logistics management skills, including inventory management, order processing, and coordination with logistics suppliers. If a company lacks sufficient internal logistics management capabilities, it may opt for more comprehensive international courier or postal services, entrusting its logistics operations to professional logistics providers.

4. Selection Strategies for Cross-Border E-commerce Logistics Channels under Different Contexts

4.1 Dynamic Selection Strategy Based on the Product Life Cycle

Cross-border e-commerce products typically exhibit lifecycle characteristics, with their requirements for logistics methods varying across different stages; therefore, a dynamically adaptive logistics selection strategy should be adopted.

During the product introduction phase, sales volumes are typically low and unstable; therefore, a light-asset logistics approach—such as postal small parcels or international express delivery—should be adopted to mitigate early-stage investment risks and financial pressure. The focus of this phase is to test market response and avoid overstocking resulting from excessive pre-ordering. Additionally, this phase can be utilized to collect logistics data from the target market, laying the groundwork for subsequent

logistics optimization.

When a product enters its growth phase, sales volume will grow steadily and gradually stabilize; at this stage, it may be advisable to consider switching to dedicated logistics services or partnering with third-party overseas warehouses to balance cost and delivery speed. During this phase, it is recommended to begin establishing relatively stable logistics partnerships and reducing unit logistics costs through economies of scale. Additionally, companies can explore a multi-warehouse coordination model by setting up overseas warehouses in their primary target markets to further enhance delivery efficiency.

When a product enters its maturity stage, with sales stabilizing at high levels and exhibiting predictable patterns, this is the optimal time to adopt an overseas warehouse model; by utilizing bulk first-mile shipping, companies can reduce unit costs, while leveraging local distribution channels to enhance the customer experience. During this phase, it may also be worthwhile to consider partnering with e-commerce platforms (such as Amazon FBA) or establishing strategic collaborations with multiple logistics service providers to further optimize logistics efficiency and reduce costs.

When a product enters its decline phase with sales continuing to decline, it is advisable to gradually reduce inventory levels in overseas warehouses and transition back to more flexible logistics solutions—such as dedicated express delivery services or postal small parcel services—to avoid stockpile buildup and capital tie-up. The key focus during this stage is to mitigate logistics risks and ensure a smooth exit from the market before the product's lifecycle concludes.

4.2 Portfolio Strategy: Reducing Risk, Enhancing Flexibility

A single logistics channel often struggles to meet the diverse demands of cross-border e-commerce; adopting a combination strategy is an effective way to mitigate risks and enhance flexibility.

The assortment strategy based on product characteristics refers to selecting appropriate logistics methods according to the specific characteristics of different types of goods. For high-value or time-sensitive products, international express delivery can be employed; for ordinary goods, dedicated line logistics or postal small parcel services can be selected based on weight and dimensions; for large items, heavy goods, or best-selling products, the overseas warehouse model can be adopted. Enterprises can establish a product classification system and define standardized logistics solutions for each category of products, thereby achieving standardization and refinement in logistics selection.

A market-region-based portfolio strategy involves adopting different logistics solutions based on the specific characteristics of each target market. For mainstream markets (such as Europe and America), overseas warehouses can be established or dedicated express delivery lines can be selected; for emerging or niche markets, postal small parcels or international express delivery services can be utilized. This regional differentiation strategy not only ensures high service quality in key markets but also enables coverage of a broader customer base.

A sales season-based supply chain strategy involves adjusting logistics methods according to the characteristics of different sales seasons. Prior to peak sales periods (such as Black Friday or Christmas), companies can proactively ship goods via sea freight to overseas warehouses to avoid capacity constraints and rising freight costs during these high-demand periods; during off-peak seasons, air freight direct shipping can be adopted to reduce capital tie-up. This strategy requires enterprises to accurately forecast their sales cycles and plan their logistics arrangements in advance.

The parallel use of multiple logistics channels is a common practice among large cross-border e-commerce platforms. By collaborating with multiple logistics service providers, these platforms can avoid over-reliance on a single logistics channel while continuously optimizing their logistics selection through performance comparisons. Additionally, this strategy enables the provision of diverse delivery options for customers with different needs, thereby enhancing the overall shopping experience.

4.3 Risk Avoidance and Cost Control Strategies

Cross-border e-commerce logistics entails various risks; effective risk mitigation and cost control strategies are crucial for ensuring the stable operation of enterprises.

Inventory risk represents a primary challenge faced by the overseas warehouse model. To mitigate inventory risk, enterprises can adopt a small-batch, frequent-replenishment strategy or establish collaborative supply chains with suppliers to enhance inventory turnover rates. Additionally, by leveraging data analytics tools to accurately forecast sales trends, companies can achieve more precise inventory planning. For slow-moving inventory, an clearance mechanism can be implemented to dispose of such stock promptly through promotions or other means, thereby avoiding the accumulation of long-term warehousing costs.

Logistics delay risks may arise from a variety of factors. To mitigate such risks, enterprises should establish an evaluation system for logistics service providers, conducting regular assessments of key indicators such as delivery timeliness and reliability for their partner logistics providers. Additionally, enterprises should develop alternative supply chains to enable a rapid transition to backup channels should issues occur with the primary logistics channel. Furthermore, purchasing logistics insurance is an effective means of risk transfer, particularly for high-value goods.

Cost control strategies encompass a variety of specific measures. Negotiating long-term cooperation agreements can help enterprises secure more favorable logistics pricing; optimizing packaging design can reduce parcel volume and weight, thereby lowering shipping costs; consolidating shipments can reduce unit costs through economies of scale. Additionally, utilizing logistics comparison platforms to select the most cost-effective logistics solution, or leveraging centralized procurement of logistics services to obtain larger discounts, are also effective cost control methods.

5. Conclusion and Outlook

5.1 Research Conclusion

This paper systematically examines the selection strategies for cross-border e-commerce logistics channels, analyzes the characteristics and applicable scenarios of mainstream logistics models, explores the key factors influencing logistics choice, and proposes corresponding optimization strategies. The study leads to the following conclusions:

First, selecting logistics channels for cross-border e-commerce constitutes a multi-objective decision-making process that requires a comprehensive consideration of various factors, including product characteristics, target markets, cost control, service quality, and the specific circumstances of the enterprise. There is no "optimal" logistics model applicable to all scenarios; instead, there is only the "most suitable" choice tailored to a particular enterprise and its specific stage of development. A successful logistics strategy must be grounded in a thorough analysis of both the internal and external environments of the enterprise, as well as a deep understanding of the distinct characteristics of different logistics models.

Secondly, dynamic adjustment and combination strategies constitute the core approach to cross-border e-commerce logistics management. As product life cycles evolve and the market environment shifts, logistics demands will also undergo corresponding changes; therefore, enterprises must possess the capability to dynamically adjust their logistics strategies. Additionally, adopting a combination strategy can effectively diversify risks, enhance the resilience and flexibility of the logistics system, and meet diverse requirements.

Third, while the overseas warehouse model offers significant advantages, it is not suitable for all scenarios. Although overseas warehouses deliver remarkable results in improving delivery efficiency and customer experience, they impose high requirements on financial strength and inventory management capabilities; thus, they are more suitable for established sellers with large business scales and stable product sales volumes. Small and medium-sized cross-border e-commerce businesses

may initially leverage third-party overseas warehouses or platform-based logistics services, and then gradually transition to the overseas warehouse model.

5.2 Future Prospects

Intelligence and digitalization will become the primary drivers of logistics innovation. With the mature application of technologies such as big data, artificial intelligence, and the Internet of Things, various segments of the logistics chain will achieve more efficient collaboration and more precise management. Innovations such as intelligent route planning, dynamic inventory management, and predictive transportation will significantly enhance logistics efficiency while simultaneously reducing operational costs.

Diversification and personalization are key trends in the development of logistics services. As the product categories and market scope of cross-border e-commerce continue to expand, the demand for logistics services is becoming increasingly diverse. In the future, logistics service providers will offer more personalized solutions to meet the specific logistics requirements of different types of goods.

Green logistics is receiving increasing attention. As global recognition of the concept of sustainable development deepens, green and low-carbon logistics approaches will gradually become industry standards. Environmental initiatives—such as optimizing packaging materials, improving transportation efficiency, and reducing carbon emissions—not only align with global sustainable development trends but also help enterprises build a strong brand image.

The collaborative sharing model has the potential to reshape the logistics ecosystem. Through deep collaboration and resource sharing among enterprises across all segments of the supply chain, information silos can be broken, and overall logistics efficiency can be optimized. Data sharing and business synergy between cross-border e-commerce platforms, logistics service providers, and platform operators will create greater value opportunities.

In summary, selecting logistics channels for cross-border e-commerce constitutes a complex yet critical decision that requires enterprises to develop systematic and dynamic logistics strategies based on their specific circumstances and strategic objectives. With advancements in technology and the maturation of the market, cross-border e-commerce logistics will continue to evolve and innovate, providing even stronger support for global trade.

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