

Free shipping in e-commerce: a systematic literature review

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Abstract

Free shipping in e-commerce has become a crucial strategy to attract and retain customers in a highly competitive markets, becoming a key advantage for companies seeking to meet evolving consumer demands. This study aims to perform a systematic review of the existing scientific literature on free shipping in e-commerce, following PRISMA guidelines and using the Scopus database to ensure an up-to-date perspective. The results show the critical role of free shipping in customer retention and acquisition, and to improve customer satisfaction, influence purchase and repurchase intention, and increase sales and market competitiveness. However, it was also observed that it can lead to an increase in returns.

Keywords: e-commerce; mobile commerce; electronic commerce; e-business; online retailer; shipping fee; free shipping; shipping policy; free shipping effect; free shipping strategies.

Envío gratuito en el comercio electrónico: una revisión sistemática de la literatura

Resumen

El envío gratuito en el comercio electrónico se ha convertido en una estrategia crucial para atraer y retener clientes en mercados altamente competitivos, convirtiéndose en una ventaja clave para las empresas que buscan satisfacer las demandas cambiantes de los consumidores. Este estudio tiene como objetivo realizar una revisión sistemática de la literatura científica existente sobre el envío gratuito en el comercio electrónico, siguiendo las directrices PRISMA y utilizando la base de datos Scopus para garantizar una perspectiva actualizada. Los resultados muestran el papel fundamental del envío gratuito en la retención y adquisición de clientes, así como en la mejora de la satisfacción del cliente, la influencia en la intención de compra y recompra, y el aumento de las ventas y la competitividad en el mercado. Sin embargo, también se observó que puede conducir a un incremento en las devoluciones.

Palabras clave: comercio electrónico; comercio móvil; comercio electrónico; negocio en línea; minorista en línea; tarifa de envío; envío gratuito; política de envío; efecto del envío gratuito; estrategias de envío gratuito.

1 Introduction

The COVID-19 pandemic has accelerated the shift towards a heavier use of e-commerce and communication platforms. Today, more people are going online to work, study, shop, entertain themselves, and even visit the doctor [1].

E-commerce is vital to consumers, entrepreneurs and governments as it allows them access to a global marketplace and greater sales opportunities as users can buy products and

services anytime, anywhere. As e-commerce becomes a bigger part of the economy, it contributes more to the total economic GDP of countries, which can drive their overall economic growth [2].

Free shipping is a strategy that has been extensively studied and researched to understand its impact both on consumer behavior [3] and on the profitability of companies [4]. It appears to be a fundamental strategy, given that it stands out as the most influential factor in purchase intention and repeat purchases [5],

shaping the competitive landscape of e-commerce, as retailers that do not offer free shipping options risk being left behind in an increasingly competitive marketplace [6], directly impacting their performance and growth.

E-commerce companies must consider several key points when implementing a free shipping offer. One is to establish a minimum purchase threshold to qualify for free shipping, as well as offer a partial shipping rate for customers who do not reach that minimum amount [7]. Another factor to consider is the distance and location of customers, as the cost of offering free shipping may vary by region [8].

On the other hand, the disadvantages of free shipping in e-commerce for fashion retailers include the risk of increasing the number of returns by setting a minimum order value [9].

A strategy e-commerce can use to counteract the increase of returns in the free shipping environment, is to establish an integrated return shipping policy and a free return shipping policy, which are very effective in improving the relationship between buyers and sellers [10].

The present article details a systematic literature review on free shipping in e-commerce. The main objective is to analyze the trends and current state of knowledge on this topic. It also seeks to answer the following research questions:

- RQ1: What is the trend in publishing articles that address free shipping?
- RQ2: How does free shipping affect consumer behavior in e-commerce?
- RQ3: What is the impact of free shipping on e-commerce performance and growth?
- RQ4: What are the key strategic considerations for implementing a free shipping policy in e-commerce?
- RQ5: What are the disadvantages of a free shipping strategy in e-commerce and how can they be countered?

After this introduction, this article is organized as follows: Section 2 presents the materials and methods, showing the search equation, the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) methodology. Section 3 presents the results and discussions, where the research questions are answered. Finally, section 4 presents the conclusions and future research suggestions.

2 Materials and methods

To conduct a systematic literature review in the context of free shipping in e-commerce, we adopted the standard systematic review method according to the original guidelines proposed by [11]. This process includes several key steps: formulating specific research questions, conducting a thorough search process, applying inclusion and exclusion criteria, assessing the quality of selected studies, collecting and analyzing data, and documenting any deviations from the initial protocol.

This section describes the search equation and inclusion and exclusion criteria, and the methodology used to conduct the systematic review of the literature on free shipping in e-commerce.

The study was carried out using journals indexed in the Scopus database, since it provides an updated perspective to carry out a bibliographic review in different areas of study. The following is Table 1, which contains the keywords used to retrieve the largest number of articles related to the study topic.

Table 1.
Search equation keywords.

Keyword group 1	("e-commerce" OR "mobile commerce" OR "electronic commerce" OR "e-business" OR "Online Retailer")
Keyword group 2	("shipping fee" OR "free shipping" OR "shipping policy" OR "free shipping effect" OR "free shipping strategies")

Source: Authors' own work, 2024

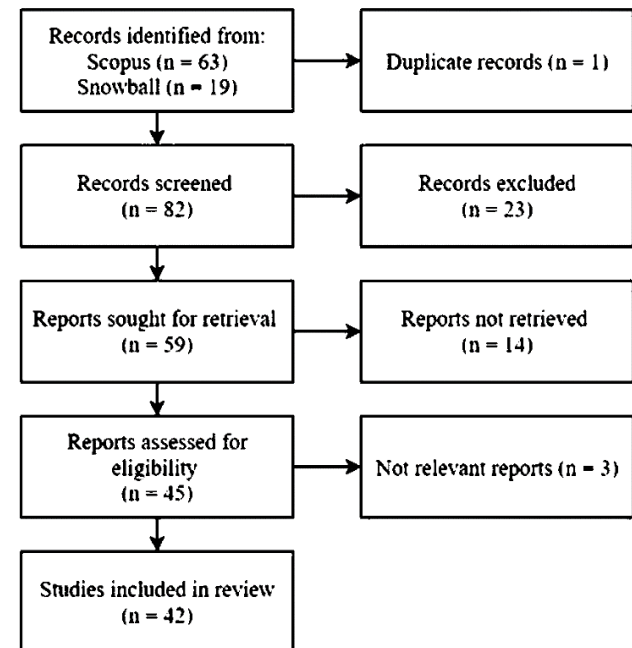


Figure 1. Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA), applied to a systematic review of the literature on free shipping in e-commerce

Source: Authors' own work, 2024.

Keyword group 1 seeks to bring together all the articles that deal with e-commerce, so five variants referring to this group were used. The purpose of Keyword group 2 is to gather the articles that study the strategy of free shipping in e-commerce.

The Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) flowchart [12], illustrated in Fig. 1, was used to document the study selection process, ensuring transparency and rigor.

The selection and classification of articles were conducted by a single researcher, strictly following the predefined inclusion and exclusion criteria. To mitigate the risk of bias, the entire process was closely supervised by two additional researchers, ensuring adherence to methodological standards and maintaining oversight throughout the review. Furthermore, all authors actively participated in the discussion and interpretation of the results, contributing to the robustness and validity of the findings.

The following inclusion criteria were considered: (1) articles with final publication status, (2) articles in English, and (3) articles that provide information relevant to at least one of the five research questions of the topic.

Exclusion criteria include the following: (1) conference papers or papers under review, (2) articles that address companies without

an online sales platform, and (3) articles that do not directly address the dynamics or impact of free shipping on e-commerce.

Sixty-three articles (63) were identified using the search equation in the Scopus database and considering the inclusion and exclusion criteria. The last search was performed in May 2024. After the title, abstract and key words were read, only 40 articles were found that met the inclusion criteria. However, it was not possible to access the complete version of 8 of these articles. After the complete reading of the remaining 32 articles, 1 duplicate article was identified and excluded, leaving 31 articles for analysis.

A similar process was carried out with the articles identified by the snowball method. Initially, 19 relevant studies were identified. Of these, 6 were excluded due to lack of access to the article. Another 2 were excluded because they were not relevant to the subject of the study. In the end, a total of 11 more articles were added to the final sample.

In total, 42 papers were included for a bibliometric and critical analysis of the topic. During the process of reading the 42 selected articles, the information was classified according to how relevant it was in answering the research questions.

3 Results and discussions

In this section, we address the research questions posed. To answer RQ1, the entire corpus of selected articles was analyzed. For RQ2 to RQ5 a more targeted approach was employed. Table 2 presents a comprehensive overview of the relevant articles, categorized according to each research question and the specific product type under investigation.

3.1 What is the trend in the publication of articles addressing free shipping?

Fig. 2 shows the number of documents published per year in relation to free delivery in e-commerce.

It is clear the number has increased compared to 2005. There was an atypical increase in 2012 and 2020. It should also be noted that the bar corresponding to 2024 corresponds to articles published between January and May 2024, the date on which the search was performed.

Table 2.
Type of product according to the five research questions.

Product	RQ2	RQ3	RQ4	RQ5
Dry, fresh and gourmet foods.	[13] [14]	[15]	[14,16]	
Personal and pharmaceutical products	[14]	[15]	[14]	[17,18]
Clothing	[19]	[20,21]	[16]	[9,17,18,19,22]
Electronics	[3]	[21] [23]	[24,25]	[10,17]
			[7] [36]	
	[5]		[37]	
	[26]	[30,31]	[38]	[27,42]
	[27]	[32,33]	[33]	[43]
	[28]	[27,34]	[39]	[44]
	[29]	[4,6,35]	[8,28]	
	[6]		[40]	
			[41]	

Source: Authors' own work, 2024

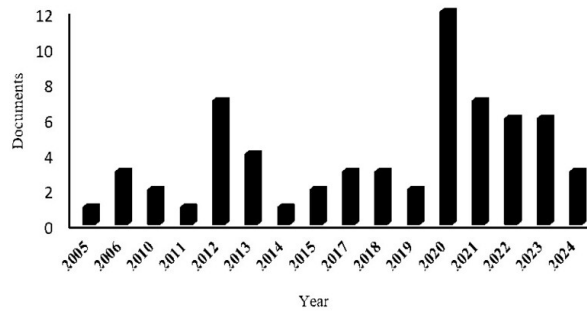


Figure 2. Number of documents published per year.
Source: Authors' own work, 2024.

The increase in publications in 2012 can be justified by the accelerated growth of e-commerce worldwide. Similarly, 2020 sees the highest growth due to the circumstances of the COVID-19 pandemic. With widespread shutdowns and social distancing measures in effect, consumers were forced to rely heavily on online shopping and businesses had to adapt quickly to meet changing demands [1].

Excluding 2012 and 2020, since they are outlier years, it can be clearly seen that there was sustained growth between 2005 and 2020. From 2021 onwards, the number of research articles on this topic has remained constant.

In conclusion, the publication trend reflects the growing importance of e-commerce and the impact of the COVID-19 pandemic on the industry. The increase in free shipping publications in e-commerce is a response to the changing needs of consumers and businesses.

3.2 How does free shipping affect consumer behavior in e-commerce?

Analysis of consumer behavior towards the offer of free shipping in e-commerce reveals a few significant trends and perceptions.

A study based on a sample of 21,905 Internet users who browsed several online store websites evidenced that 46% of customers are inclined to make repeat purchases because of the free shipping offer [5].

Therefore, it is important to consider that the absence of a free shipping offer may lead customers to abandon the purchase process [26]. Additionally, if shipping charges are high, they may discourage purchases or encourage larger orders to avoid such charges [6,29].

3.2.1 Consumer purchase decision

Free shipping can be implemented for different types of products. For example, [13] analyzed the interaction between product category (fresh and indulgent) and purchase factors (shipping costs and delivery time) through an experiment based on 240 surveys and its subsequent analysis of variance. The study concluded that free shipping and fast delivery increase consumer satisfaction and positively influence purchase intention.

Thus, satisfaction, purchase intention, and repurchase are based on consumers' preference for free shipping, as it is the

strategy with the greatest impact [5,13,19], especially for lower-priced products [3]. Even for risky products, free shipping promotions can motivate consumers to make purchases [19].

This means customers tend to make repeat purchases when the seller offers free shipping. Consequently, implementing free shipping not only improves competitiveness, but also positively influences consumer behavior [26].

3.2.2 *Perceived risk and customer experience*

Another important aspect is the long delivery time, which generates a sense of risk in customers. This results in reduced satisfaction and negatively impacts purchase intentions. Online retailers could use free shipping strategies as an alternative to counteract extended delivery times [28], as this would lead buyers to experience a higher level of satisfaction [27].

Therefore, the positive perception towards free shipping impacts online behavior considerably, as consumers are attentive to the availability of the offer [5, 26]. Even showing free shipping by including the shipping cost in the product price potentially influences the purchase decision [25], as consumers are very sensitive to shipping charges [14].

3.3 *What is the impact of free shipping on e-commerce performance and growth?*

E-commerce can benefit greatly from the implementation of free shipping. The literature supports this benefit and growth in the number of sales from their platforms. For example, [4] indicates that there is only a 5.27% probability that implementing free shipping promotions will result in less than 5.07% of the expected profit, suggesting a high likelihood of success. This means the implementation of the free shipping strategy should be done effectively and adapted to the market dynamics to maximize profitability [31,32].

Another study confirms that prominently displaying the shipping offer drives purchases and increases the shopping cart value [21]. This strategy is especially effective, as free shipping generates a higher incidence of orders and is the most effective in terms of customer acquisition [15], increasing the proportion of those who visit and end up purchasing on the platform [27]. Therefore, those retailers that do not offer free shipping options will lose out in a competitive marketplace [6].

3.3.1 *Coordination among market players*

Considering the study discussed in [30], it is usually assumed that a retailer A which has accumulated extensive experience on the platform and has abundant sales information will be able to forecast demand more accurately. In contrast, retailer B is a newcomer with limited information about market demand. In the scenario where retailer B obtains information and both retailers offer free shipping, the author, through numerical analysis, concludes that the platform reaches its maximum profitability when both information exchange and free shipping are carried out simultaneously.

Retailers' free shipping policies impact not only their own profits, but also those of the supplier [31]. When there is coordination in the determination of the free shipping threshold with the delivery operator, it will generate higher profits [34].

In a domain analysis (retailer, supplier) in the platform-dominated model, it is observed that as the selling price decreases, the platform service level tends to decrease. The free shipping strategy can be a key component in maintaining a competitive service level [33].

Therefore, retailers must not only focus on their own costs and profit margins, but they must also strive to effectively manage lead times [45] to generate a positive impact on the profitability of the supplier, the retailer, and end customers [35]. Additionally, carefully determining base prices and shipping rates is crucial, as sometimes base prices of products tend to increase when free shipping is offered [15,23].

3.4 *What are the key strategic considerations for implementing a free shipping policy in e-commerce?*

The previous points have shown consumer behavior and the impact of free shipping in e-commerce, but this is not enough. One must also be aware of the strategic considerations and the different free shipping policies that online retailers can consider [41].

The distance from the company to the customer's point of location can be an important factor in considering whether to offer free shipping. A retailer with a relatively small local market size may benefit from moving online under a free shipping policy. Those retailers who offer goods or services to different regions, on the other hand, will see their prospective shipping cost affected according to the distance from one region to another [8].

Likewise, it is important to consider the timing when framing shipping promotions. For offers in the immediate future, emphasizing 'no shipping costs' is relatively more effective. Conversely, for promotions set in the more distant future, framing the offer as 'free shipping' tends to be more effective [38].

3.4.1 *Pricing considerations for free shipping*

Retailers with low prices should opt for a free shipping policy to outperform the competition and increase their profits, while those with high prices benefit more by adopting the calculated shipping policy, thus mitigating the impact of higher shipping rates [31]. Meanwhile, another study [16] mentions that the price of shipping service for a retailer should be carefully considered. In the case of selling fashion items, it is recommended to offer free shipping, while for commodities this practice is not advised. The literature also presents a mathematical model for pricing.

In addition, including the cost of shipping in the price of the product avoids variations in shipping costs. This is what many retailers are looking for to keep the price constant and not be affected by unpredictable changes in shipping costs. [24].

If two hypotheses are posed in which retailers using split pricing (product price and shipping price) and retailers using net pricing (shipping cost included in the product price) are

compared, it is evident that net pricing captures the attention of certain consumer groups, even when it is more costly [25].

Furthermore, if an online retailer cannot offer fast shipping, then it may choose to offer free shipping. This involves including shipping charges in the price of the product to reduce perceived ambiguity, which can increase satisfaction and purchase intentions [28].

3.4.2 *Collaboration in the supply chain*

It is clear collaboration between all links in the supply chain is important and free shipping can be used by all of its components. That is to say, if carriers could offer discounted shipping rates to retailers that handle large quantities, this would motivate retailers to implement free shipping [36]. It would be the same for suppliers offering a free shipping policy to the e-retailer when the order quantity reaches a predefined quantity, motivating retailers to offer free shipping themselves [33,37].

Similarly, all rational retailers should place joint orders when their inventories are insufficient to meet demand or do not qualify for free shipping. These discounts could stimulate the final retailer to offer free shipping themselves [40].

3.4.3 *Free shipping thresholds*

Some companies offer free shipping, but in order for a customer to benefit from this offer, they must short a minimum threshold, meaning their purchase must meet a minimum amount. However, not all customers reach this threshold and may thus become discouraged during the purchase process. Therefore, establishing a partial shipping fee would be a viable alternative to avoid this situation. If the customer falls short of the minimum order threshold, a proportional discount would be applied based on the amount purchased, which could contribute to an approximate 9% increase in sales on the e-commerce platform [7].

Complementary item recommendations also play a crucial role in e-commerce strategies. When customers fall short of the minimum order threshold for free shipping, an effective recommendation system can encourage additional purchases to meet this requirement. This approach not only increases the order value but also reduces the likelihood of cart abandonment. By strategically suggesting relevant items, e-commerce platforms can simultaneously enhance customer satisfaction and boost sales, turning potential lost sales into successful transactions [46].

In a segment model where the company can categorize its customers into various segments and then set shipping rates, a free shipping promotion is predicted to increase order incidence by at least 10% for all customers, but by more than 35% for the most responsive segment [14].

3.5 *What are the disadvantages of a free shipping strategy in e-commerce and how can they be countered?*

So far, the reviewed and analyzed literature related to free shipping in e-commerce shows its implementation can be highly beneficial. However, every strategy has disadvantages or areas that need improvement.

3.5.1 *Relationship between free shipping and returns in E-commerce*

In the free shipping strategy, returns predominate in fashion categories. In addition, newsletters, paid search, catalogs, and free shipping substantially increase returns by as much as 18% [22].

It is noticeable that there is a relationship between consumer confidence and free shipping [18] and this effectively fuels the explosive growth of e-commerce, but it also hinders the improvement of logistics service quality, pushing the e-commerce market into a free shipping trap [43].

Free shipping promotions encourage consumers to purchase risky products, those whose quality is difficult for consumers to evaluate, leading to high return rates. This phenomenon, known as the free shipping effect, has a higher impact on online retailers that market risky products, such as clothing [19]. For example, for an online retailer specializing in urban and sports fashion, setting a minimum order value increases the number of returns [9].

3.5.2 *Countering returns*

The relationship between buyers and sellers gets damaged by returns, which is why an integrated return shipping policy, and a free return shipping policy can be established, both of which are very effective in improving the relationship between buyers and sellers. Online sellers should consider employing these approaches to improve their relationship marketing [10].

Offering free returns has a positive impact on customer purchase behavior, generating a significant increase in post-return purchases [17].

It should be noted that the implementation of free returns policies in e-commerce has a significant influence on conversion rates. Those retailers that bear the costs associated with returns manage to reduce both uncertainty and expense for consumers [27].

Thus, free return shipping is often the dominant strategy in comparison to no-cost returns [42], however, depending on various factors, retailers may choose to offer free returns or define a specific cost for returns [39].

4 **Discussion and Conclusions**

This systematic literature review provides a comprehensive and up-to-date analysis of free shipping in e-commerce, being the first published study to address this topic exclusively. It compiles existing literature from the Scopus database and follows PRISMA guidelines to ensure rigor and transparency in the selection and analysis of the reviewed studies.

RQ1: Significant growth in research on this topic has been observed since 2005, with a notable increase in 2020. This increase is mainly attributed to the COVID-19 pandemic, which boosted e-commerce due to the isolation policies implemented by the governments of several countries.

RQ2: Consumer behavior improves with free shipping, increasing satisfaction and purchase intent, showing that

there is a strong preference for free shipping. This strategy encourages repeat purchases and decreases shopping cart abandonment, increasing the competitiveness of companies and mitigating the negative impact of long delivery times.

RQ3: Existing literature supports that free shipping in e-commerce has a positive impact on platform performance and growth by increasing sales, conversion rate and profitability, but requires careful cost and logistics management to maximize its effectiveness.

RQ4: To implement a free shipping policy in e-commerce, it is crucial to consider aspects such as customer distance, pricing strategy, collaboration with suppliers and the inclusion of partial shipping rates. These strategic actions can be decisive in maximizing sales and the competitiveness of platforms in the online market.

RQ5: While free shipping in e-commerce can attract more customers and drive sales, it can also lead to an increase in returns, especially in fashion categories. Implementing effective free returns policies can mitigate these challenges, improving customer satisfaction.

By addressing these aspects, this study serves as a reference for refining shipping strategies in e-commerce. The implementation of tailored free shipping policies aligned with business models and market conditions is recommended.

The practical implications of free shipping relate to its effects on business operations, logistics, and consumer behavior. While it increases sales and customer satisfaction, it also raises shipping and return costs, requiring businesses to optimize logistics, set purchase thresholds, and refine return policies. Consumers are more likely to complete purchases and prefer retailers offering free shipping, influencing market competition. However, in industries with high return rates, such as fashion, businesses must balance free shipping incentives with strategies to minimize financial losses.

Despite extensive research on free shipping in e-commerce, several gaps remain. There is limited exploration of how artificial intelligence and machine learning can optimize free shipping strategies to reduce operational costs without compromising customer satisfaction. Additionally, the environmental consequences of increased shipping frequency due to free shipping policies are not well understood, leaving uncertainty about their sustainability impact. Moreover, most existing studies focus on developed markets, with little insight into the challenges and effectiveness of free shipping strategies in regions with underdeveloped logistics and emerging e-commerce sectors.

In this context, future research should investigate AI-driven models for optimizing free shipping policies, emphasizing cost efficiency and consumer experience. Further studies on the environmental impact of free shipping and potential sustainable alternatives, such as carbon-neutral delivery solutions, are needed. Additionally, examining how free shipping strategies can be adapted to developing markets, considering logistical and economic constraints, would provide valuable insights into their global applicability and long-term feasibility.

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