Politecnico di Torino

POLITECNICO DI TORINO

Master's Degree Programme in Management Engineering

The returns management in e-commerce: processes and strategies

Master's Thesis

Supervisors:
Prof.ssa Anna Corinna Cagliano
Prof.ssa Giada La Scalia

Candidate:
Giuliano Enea

Academic Year 2025-2026

Summary

Introduction

Context and relevance of the topic

E-commerce is a phenomenon that has experienced significant development and diffusion since the 1990s and today accounts for approximately 20.5% of global commerce (emarketer.com), having grown exponentially since its inception. A particularly strong driver of e-commerce growth was the COVID-19 pandemic, declared by the World Health Organization on 30 January 2020 and officially ended on 5 May 2023. Figures 1 and 2 show that in 2020, within the US market, e-commerce sales experienced an absolute increase from USD 569 billion to USD 807 billion, representing a jump of approximately USD 186 billion compared to the extrapolated 2020 trend based on sales between 2013 and 2019. This increase was sustained from 2020 to 2025, with a subsequent growth rate even higher than the average observed between 2013 and 2019. It can therefore be inferred that the COVID-19-related shift was irreversible and that the pandemic represented a growth opportunity for e-commerce, as it forced consumers to make online purchases, thereby increasing their familiarity and competence in using e-commerce platforms.

The e-commerce revolution has represented an opportunity both for consumers, who have benefited from a market closer to the conditions of perfect competition, allowing them to achieve greater economic advantages, and for firms, which have gained access to a broader customer base despite increased competitive pressure, thus encouraging efficiency gains.

Alongside these opportunities, e-commerce also presents several critical issues, among which returns management stands out. Returns management is a complex process as it is closely linked to customer behaviour, logistics, inventory management, product characteristics, recovery technologies, environmental impacts, liquidity reduction due to the prompt refund of customers, brand perception, and overall business profitability. As such, it represents a key element affecting the entire value chain. A high return rate leads to increased immediate cash outflows, while the recovery of product value is delayed or, in some cases, entirely lost. This results in reduced profitability and increased pressure on cash flow, particularly during seasonal peaks, thereby requiring careful management of banking and financial timelines to avoid liquidity constraints.

These challenges erode corporate profits and force firms to adopt an integrated approach to issues related to customer behaviour, logistics, operations, return policies, and environmental sustainability, with the objective of minimising the negative impact of returns on overall profitability.

With reference to the Italian market, return rates in e-commerce amount to approximately 5% for fast-moving consumer goods, 15% for electronics, and over 40% for the fashion sector (Arianna Seghezzi et al., 2021).

In the United States, according to the National Retail Federation, the average return rate in the retail sector was approximately 16.9% in 2024, with online retail exhibiting return rates around 21% higher than those of the overall retail sector. By comparison, the overall return rate in 2019 was 8.1% (National Retail Federation, 2024). Capital One Shopping statistics estimate online return rates of 24.5% in 2024, 17.6% in 2023, and 16.4% in 2022. Although the precise figures vary across sources, these data clearly indicate an upward trend in online returns, which may generate inefficiencies and diseconomies for firms.

This trend compels companies to implement appropriate strategies to mitigate the negative effects of returns on profitability. Such strategies include providing accurate product descriptions, improving order fulfilment accuracy, implementing more efficient returns management systems, and adopting customer management solutions aimed at reducing returns without compromising customer satisfaction.

Today, returns management is increasingly viewed not merely as a cost centre, but as a process through which value can be created for firms by increasing sales, recovering value from returned products, and reducing environmental impact.

Objective of the thesis

The objective of this thesis is to describe the product return processes in e-commerce, analyse consumer behaviour, and examine the strategies that companies can implement in order to: prevent returns, safeguard corporate profitability, minimise the negative effects of returns, and transform returns from a problem into a source of value for the firm. Furthermore, in order to operationally define the most appropriate strategy to adopt, a decision optimisation model related to returns management is proposed.

Research methodology

With regard to research methodology, this study adopts a qualitative and conceptual approach, focusing on understanding the opinions and attitudes of individuals and firms towards return policies in e-commerce. This methodology is used to examine and evaluate consumer motivations underlying product returns and to understand the strategies adopted by companies in managing returns.

Information is collected through documentary sources, including books, peer-reviewed academic articles, databases, corporate websites, industry association websites, and European and US institutional sources addressing e-commerce, with particular emphasis on returns management. Through this approach, the study identifies and analyses the key concepts underlying returns management and explores the ideas, theories, hypotheses, and models proposed by scholars in order

to understand the relationship between returns management, consumer behaviour, and corporate strategies.

Structure of the thesis

The first phase of the thesis consists of a descriptive analysis of the e-commerce business and its evolution over time. Subsequently, returns management processes and their related economic aspects are examined, with the aim of providing a reference framework for the subsequent stages of the study. The analysis then focuses on consumer behaviour, examining consumers' perceptions, attitudes, and motivations with respect to returns management policies. In connection with consumer behaviour, the strategic actions that firms can implement to minimise the negative effects of returns are discussed.

The thesis further develops an overview of decision-making models proposed in the literature and applied to returns management and proposes a decision-support model for selecting strategies aimed at improving returns management. Finally, the study presents a synthesis of the results, concluding remarks, limitations of the research, and potential directions for future development.

Chapter 1 – The evolution of e-commerce and its advantages

1.1 The main phases in the evolution of e-commerce

During the 1970s, what can be defined as the first generation of e-commerce emerged, namely Electronic Data Interchange (EDI), formalised by the Accredited Standards Committee. Companies across different industries began to adopt EDI throughout the 1970s and 1980s. EDI enabled firms to exchange information, place orders, and execute electronic fund transfers through computer-based systems, allowing the transfer of standardised business documents via private telecommunications networks (Sawanibi, 2001). However, the diffusion of EDI was slow. By the end of the 1990s, fewer than 1% of companies in Europe and the United States had adopted EDI (Timmers, 1999).

The second generation of e-commerce is characterised by the transaction of goods and services via the Internet, which initially emerged as a research tool and later evolved into a commercial medium. The origins of the Internet can be traced back to the 1960s, with the establishment of the Advanced Research Projects Agency Computer Network (ARPANET), the precursor of the Internet, created to support research in high-technology fields. The number of ARPANET nodes increased from four in 1969 to fifteen in 1971. The term “Internet” did not come into use until 1982, when the number of hosts on ARPANET reached 213. In 1983, the Internet Protocol (IP) became the sole approved method for data transmission across the network, enabling all computers to exchange information on an equal basis.

In 1986, the National Science Foundation (NSF), a US government agency, launched NSFNET with the aim of providing high-speed communication links among major supercomputing centres in the United States. Although initially slow—supporting transmission speeds of 56 kilobits per second—and frequently congested, NSFNET demonstrated significant potential. Consequently, the agency called for proposals to build and maintain a higher-speed version of the network. The NSFNET backbone thus became the cornerstone of the Internet based on the TCP/IP protocol suite (Anthes, 1994).

In 1991, NSFNET removed commercial restrictions on network usage, thereby opening new opportunities for e-commerce. Advanced Network & Services (ANS), founded by IBM, MCI Communications Corp., and Merit Network Inc., provided Internet connectivity to commercial users without governmental restrictions on online commercial traffic. The first examples of modern e-commerce emerged with the development of the World Wide Web in the early 1990s. In 1993, Mosaic—one of the first Internet browsers—was launched, and thanks to its graphical interface and rapid diffusion, the Internet became more intuitive and visually appealing (Tian, 2007).

In 1992, the first online bookstore was founded by Charles M. Stack under the name Book Stacks Unlimited, later renamed Books.com. The first documented online purchase occurred two years later, on 11 August 1994, when Dan Kohn sold a Sting album for USD 12.48.

In 1995, Amazon.com was launched and described by Jeff Bezos as "the world's largest bookstore". Just one year later, it became a multi-million-dollar company, offering a database of 1.1 million books searchable by title, author, subject, or keyword—an innovation appreciated by both publishers and customers. Two months after Amazon's debut, eBay, the world's most famous online auction platform, was launched. In 1996, Dell began selling personal computers directly to consumers via the Internet, and in 1997 the commercial domain (.com) overtook the educational domain (.edu) as the most widespread domain (Kim, 1998).

Nevertheless, online shopping remained a niche phenomenon and only experienced its first major turning point towards the end of the 1990s, particularly in 1999, with the global diffusion of ADSL broadband connections. Internet access became faster and more convenient, online shopping processes were simplified, and e-commerce began to spread more widely among consumers.

1.2 Trends in online sales over time

An analysis of the quantitative development of online sales highlights the rapid growth of e-commerce. In 1996, e-commerce transactions in the United States generated revenues of USD 707 million, which increased to USD 2.6 billion in 1997 and USD 5.8 billion in 1998 (Fellenstein & Wood, pp. 9–10). Amazon's sales grew from less than USD 16 million in 1996 to USD 1.6 billion in 1999, while Dell's daily sales increased from under USD 1 million to USD 40 million in less than three years (Costa, 2001, p. 34). Total estimated e-commerce sales for 2001 amounted to USD 32.6 billion, representing a 19.3% increase compared to total e-commerce sales in 2000 (Yan Tian et al., 2008).

Considering more recent years, the trend of online sales in the United States from 2013 to 2025 (Figure 1) shows continuous growth in the sector up to 2025. The data also highlight the impact of the COVID-19 crisis, which began in January 2020 and caused a structural shift in sales volumes that persisted even after the end of the pandemic. Between 2013 and 2018, the average annual growth amounted to USD 49.24 billion, whereas between 2022 and 2025—excluding the direct COVID-19 effect—the average annual growth rate increased to USD 95.6 billion, representing a 94% increase compared to the pre-pandemic period.

Figure 3 presents forecasts for US e-commerce sales up to 2029, indicating an average annual growth of USD 190 billion between 2025 and 2029. Figure 2 illustrates the evolution of the e-commerce market relative to the overall retail market in the United States. With regard to the European Union,

Figure 6 shows e-commerce sales from 2020 to 2025, revealing a trend broadly comparable to that of the United States. However, between 2022 and 2025, the average annual growth rate in the EU was USD 53.3 billion, compared to USD 95.5 billion in the United States, resulting in an overall growth of 21.37% in the EU versus 28.3% in the US. This indicates a weaker growth dynamic in the European market.

In the United States, the most significant e-commerce product categories are DIY and hardware (USD 252.8 billion), fashion (USD 197.4 billion), and food (USD 195.3 billion). Figure 4 reports online sales in 2024 for the main product categories in US e-commerce, while forecasts for 2029 are also presented. Figure 5 illustrates the projected percentage growth in sales for these categories, showing that the food sector is expected to grow by nearly 100%, with an increase of approximately USD 184 billion between 2024 and 2029, thereby becoming the leading e-commerce sector in the United States. It should be noted that a certain degree of variability exists among the statistical data reported by different sources, particularly for the US market. This variability is likely attributable to differences in the definition and scope of what is classified as e-commerce within statistical analyses.

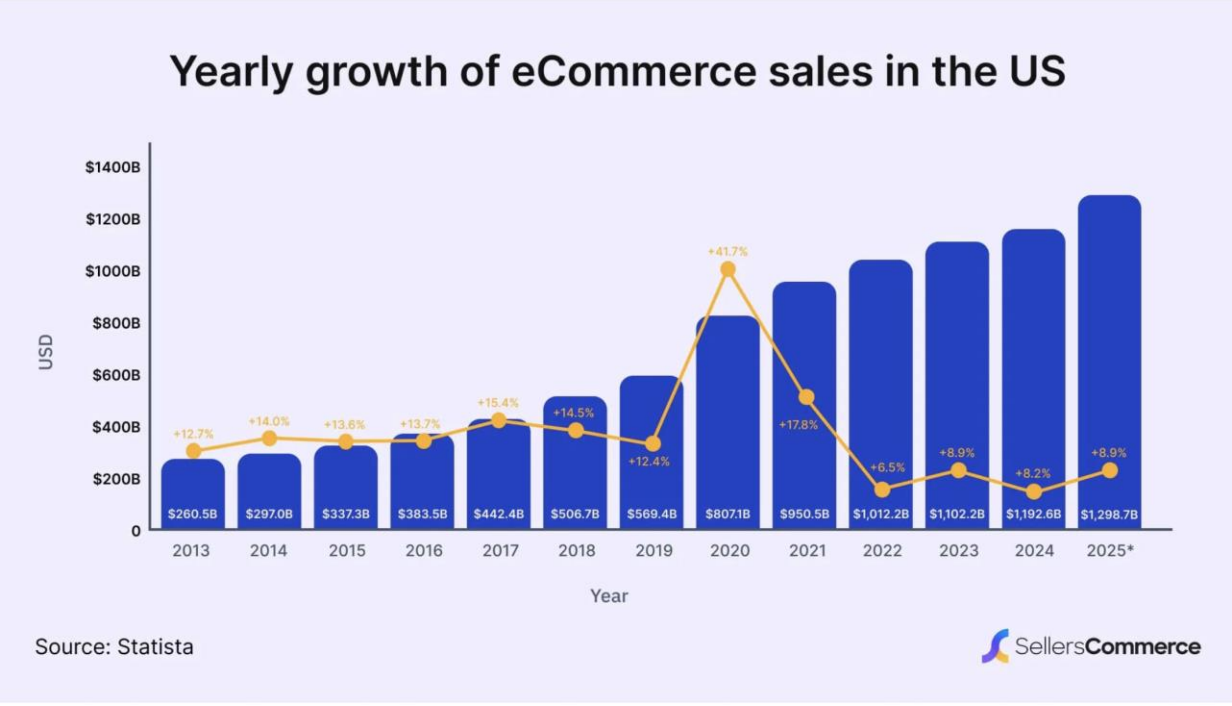

Fig.1 US yearly growth of eCommerce 2014-2024
https://www.sellerscommerce.com/blog/us-ecommerce-sales/

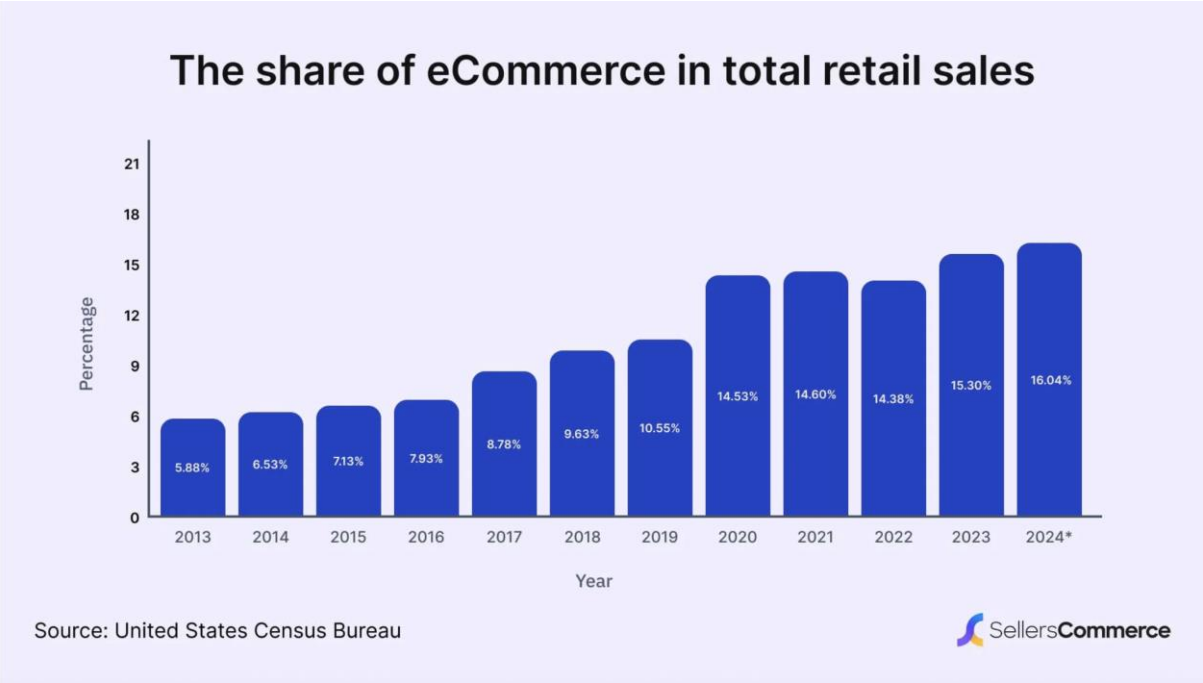

Fig.2 – US eCommerce in total retail sales
https://www.sellerscommerce.com/blog/us-ecommerce-sales/

Fig.3 US eCommerce sales projection 2024-2029
https://www.sellerscommerce.com/blog/us-ecommerce-sales/

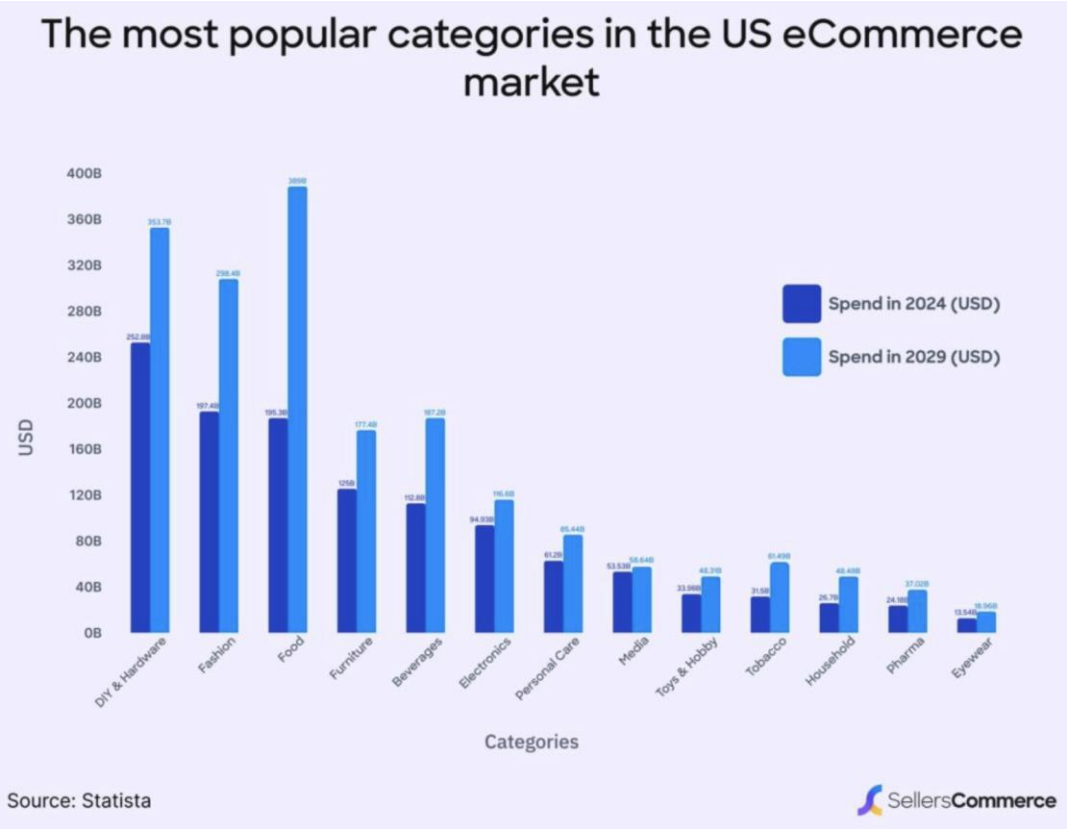

Fig.4 The most popular categories in US eCommerce
https://www.sellerscommerce.com/blog/us-ecommerce-sales/

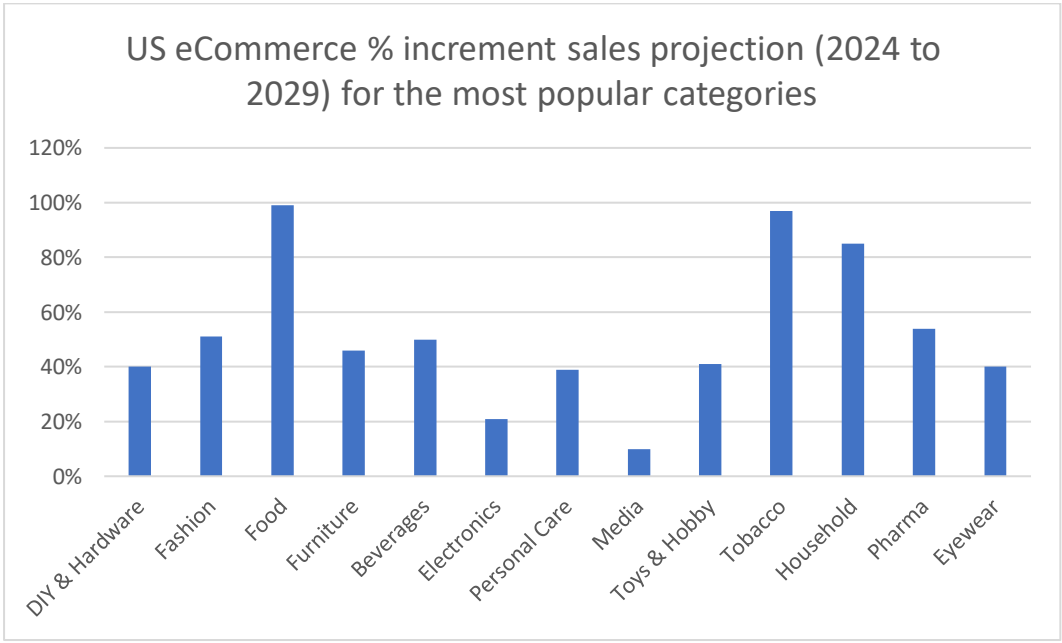

Fig.5 US eCommerce % increment sales projection(2024-2029) for the most popular categories

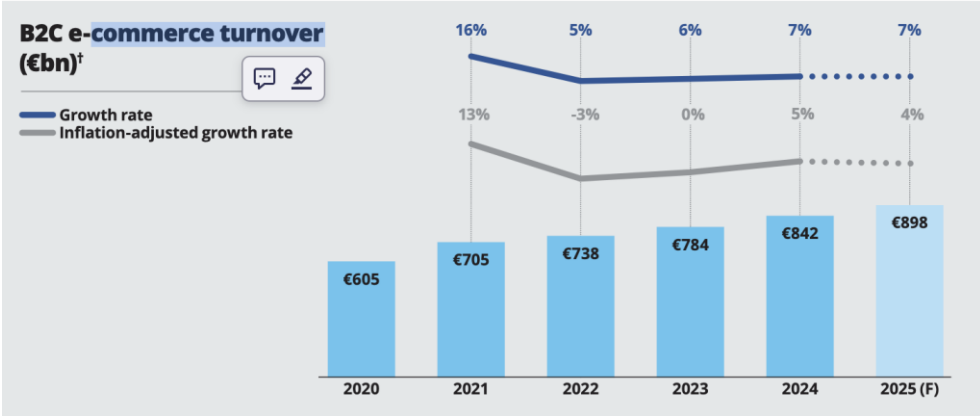

Fig.6 –EU eCommerce turnover 2020-2025

https://ecommerce-europe.eu/wp-content/uploads/2025/10/CMI2025_LIGHT_CORRIGENDUM.pdf

1.3 The advantages of e-commerce and its competitiveness factors

Compared to traditional commerce, e-commerce offers several fundamental advantages. In particular, according to Laudon et al. (2021), Brynjolfsson et al. (2000), and Chaffey et al. (2019), e-commerce overcomes temporal and spatial constraints, as it is not limited by store opening hours or geographical distance. The volume of goods offered for sale is not constrained by physical warehouse space, and e-commerce platforms can provide a wider variety of brands and product types than traditional retail formats. A well-known example is Amazon, originally described by Jeff Bezos as "the world's largest bookstore".

From a cost perspective, e-commerce enables firms to reduce intermediary and distribution-related operational costs, thereby improving profitability while simultaneously offering potential price advantages to consumers. Furthermore, e-commerce significantly reduces information asymmetry, as information flows not only from firms to consumers but also from consumers to firms. It enables targeted marketing actions, such as the use of data for personalised offers, promotions, and product recommendations. E-commerce also offers greater scalability, allowing firms to expand assortments or sales capacity more easily than in traditional retail. Additionally, it provides advanced data analytics and performance measurability through precise tracking of visits, conversions, and purchasing behaviour.

For consumers, e-commerce offers increased convenience, time savings, and the ability to compare prices, offers, reviews, and product descriptions online.

These characteristics, valued by both consumers and firms, have contributed to the success of e-commerce and its establishment as an integral component of the modern economy. Over time, consumers have evolved from passive recipients to active participants in online commerce, increasingly demanding rapid and customised responses to their needs. In particular, consumers

expect access to peer product reviews, simple payment processes, and fast, cost-free return options. As a result, e-commerce firms are required to adapt their business models to meet these expectations. A range of competitive factors influences consumer behaviour and makes e-commerce preferable to traditional retail. According to Solomon (2017), Schiffman et al. (2015), and Chaffey et al. (2019), these factors include perceived cost savings compared to in-store purchases, trust in reliable brands, perceived fraud risk and the guarantees offered by websites or payment systems, available payment methods that reduce entry barriers, website usability and interactivity, delivery times and costs, return policies, particularly easy and free returns, customer service quality, seller reliability as assessed through ratings, the number of product reviews and ratings, sales volumes for specific products, general customer opinions, technological readiness, past experiences, promotional activities, and the quality of product details, descriptions, and images, as well as social media activity.

Several authors have examined the influence of these factors in different contexts. Bucko et al. (2018), applying factor analysis to survey data, found that product price represents the most important criterion for online purchasing. Discounts, price comparisons with physical stores, payment methods, delivery times, product reviews, and the quality of product descriptions and images were also identified as key evaluation criteria. Conversely, the number of social media followers, social media activity, website activity, mobile optimisation, search engine positioning, and limited product availability were found to be of lesser importance.

Pilík (2013) observed that age and Internet familiarity significantly influence purchasing behaviour, helping to explain the growth of e-commerce. Masínová and Svandová (2014), analysing a sample of 167 respondents, found that product descriptions, complaint resolution, product images, payment options, and response times are among the factors that most strongly influence customer satisfaction. Rajyalakshmi (2015), examining a sample of 1,500 Internet users from six major Indian cities, found, using regression analysis, that perceived risk, price, and promotion exert the greatest positive influence on customers' propensity to purchase. Similarly, Agyapong (2017), based on an online questionnaire administered to 184 respondents, identified convenience and pricing/discounts as the primary factors influencing online shopping behaviour.

Chapter 2 – Returns Management

2.1 Activities in returns management

In 1992, executives from a group of globally operating companies, together with a team of academic researchers, began developing a relationship-oriented and process-based Supply Chain Management (SCM) framework. In February 1996, the Global Supply Chain Forum (GSCF) framework was presented during a three-day executive seminar co-sponsored by the Council of Logistics Management. Within the Forum, the supply chain was defined by Douglas et al. (1997) as:

"the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders."

The members of the Forum identified eight key business processes that must be implemented both within and across firms in the supply chain:

Customer Relationship Management, which provides the structure for developing and maintaining relationships with customers;

Customer Service Management, which represents the firm's interface with customers, including the management of the Profile Service Agreement (PSA), and provides a single source of customer information;

Demand Management, which balances customer requirements with supply chain capabilities;

Order Fulfilment, which includes all activities necessary to define customer requirements, design the logistics network, and fulfil customer orders;

Manufacturing Flow Management, which includes all activities required to move products through production facilities and to manage manufacturing flexibility within the supply chain;

Supplier Relationship Management, which provides the structure for developing and maintaining relationships with suppliers, including the establishment of PSAs between the firm and its suppliers;

Product Development and Commercialisation, which provides the structure for jointly developing and bringing new products to market with customers and suppliers;

Returns Management, which includes all activities related to returns, reverse logistics, gatekeeping, and return avoidance.

Dale S. Rogers et al. (2002) provide a detailed description of returns management, examining the activities of each sub-process, analysing the interfaces between functions, processes, and firms, and illustrating successful implementation examples based on both the literature and in-depth interviews with managers across a wide range of industries.

As a preliminary step, the authors classify types of returns into the following categories:

Consumer returns, which may arise due to factors discussed in the previous chapter or as a result of warranty claims;

Marketing returns, such as policies whereby manufacturers allow retailers or buyers to order large quantities of products while guaranteeing the return of unsold items without penalty (a practice particularly common in the food sector);

Asset recovery, including the return of containers, pallets, and similar assets;

Product recalls, typically due to product defects;

Environmental recalls, involving products withdrawn from the market due to non-compliance with environmental regulations.

Returns may originate from manufacturers, distributors, or end customers.

With regard to the definition of returns management, Rogers et al. (2002) propose the following interpretation:

"Returns management includes all activities related to returns, reverse logistics, gatekeeping, and avoidance, which can be interpreted as sub-processes within the supply chain hierarchy."

These activities include:

- **Reverse logistics,** defined as the process of moving goods from their typical final destination for the purpose of recapturing value or ensuring proper disposal. Reverse logistics may also include remanufacturing, refurbishment, reconditioning of products returned due to damage, recovery operations, and recalls. It encompasses recycling programmes, hazardous material handling, disposal of obsolete equipment, and asset recovery.

  The Council of Supply Chain Management Professionals (CSCMP) defines reverse logistics as "the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods, and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal."

  Within reverse logistics, disposal refers to decisions regarding the final destination of returned products, which may include resale in secondary markets, recycling, donation, refurbishment, or landfill disposal. Firms should establish disposal guidelines to determine the appropriate outcome for returned items and make timely decisions, for example by discarding products with specific date codes or those that rapidly lose value over time.

  Reverse logistics thus constitutes a core component of returns management and includes transportation, sorting, resale, repair/refurbishment, recycling, and disposal activities.

- **Return avoidance**, which involves identifying and implementing measures to minimise the number of return requests. This may include ensuring the highest achievable product quality and usability prior to sale and shipment, designing promotional programmes, providing clear and comprehensive instructions, training sales personnel, offering call centres or online support platforms to assist customers after purchase, and activating online technical support centres-particularly for electronic products-to help customers resolve installation or configuration issues and avoid unnecessary returns.
- **Gatekeeping**, which refers to activities aimed at controlling return flows. The primary objectives of gatekeeping are to assess whether returned products are authorised to re-enter the firm, filter distortions in the returns process, and allow only legitimate and approved returns to enter the reverse flow of the manufacturer and the supply chain (Russo, 2008). Gatekeeping involves reviewing information on returned items and the reasons for return in order to determine the most appropriate method for value recovery. It also includes decisions regarding which items are admitted into the reverse flow. For instance, at the stage of return request initiation, it may be possible to redirect the request to technical support to assist the customer in using the product correctly and thereby avoid the return altogether.

Returns management therefore extends beyond reverse logistics and recovery activities to include managerial and operational strategies aimed at preventing or minimising returns.

2.2 Sub-processes in returns management

To provide a clearer view of the returns management process, Rogers et al. (2002) present a sequence of sub-processes divided into strategic and operational components (Figure 4). The lines connecting the returns sub-processes to the other seven supply chain management processes at the centre of the diagram represent the interfaces between each sub-process and those processes. Within these sub-processes are embedded activities related to reverse logistics, return avoidance, and gatekeeping. Figure 4 highlights that returns management should be considered an integral element of corporate strategy.

2.2.1 Strategic sub-processes in returns management

The strategic sub-processes identified by Rogers et al. (2002) and illustrated in Figure 4 are as follows:

- **Determine Returns Management Goals and Strategy**: This sub-process involves defining the objectives and strategic orientation of returns management. Firms may pursue goals such

as customer retention, enhancement of corporate image, profit improvement, environmental sustainability, legal compliance, or a combination thereof.

- **Develop Avoidance, Gatekeeping, and Disposition Guidelines**: This sub-process focuses on developing guidelines to prevent returns, manage gatekeeping activities, and determine disposal options. In collaboration with suppliers and customers, the firm develops recovery and disposal options for returned items and defines processes for identifying appropriate recovery or disposal actions while simultaneously reducing return volumes. Effective avoidance, gatekeeping, and disposal procedures reduce handling costs across the supply chain by limiting the number of return requests, identifying authorised returns at an early stage, and making timely decisions regarding the disposition of returned products. Possible options include redistribution through the same sales channel, resale in secondary markets, donation, public auctions, recycling, refurbishment, or landfill disposal. Recovery, recycling, or refurbishment activities may be carried out either internally by the manufacturing firm or outsourced to third-party logistics providers.
- **Develop Returns Network and Flow Options**: This sub-process concerns the design of the reverse logistics network and the evaluation of outsourcing options. When developing the returns network, the firm must consider different return types and establish procedures tailored to each. For example, product recalls typically require efficient communication systems with consumers and carefully designed processes for product collection and handling. Return transportation may be managed internally or outsourced to third-party logistics providers, while product reception may occur in outbound logistics facilities, dedicated areas, or—preferably—specialised return centres, as in the case of Amazon.
- **Develop Credit Rules**: This sub-process establishes general guidelines—often in collaboration with suppliers and customers—for evaluating returned merchandise, authorising credits, and defining credit policies.
- **Determine Secondary Markets**: This strategic activity concerns identifying appropriate secondary markets for returned products, whether sold as-is, repaired, or disassembled into components for recycling. Secondary markets may differ geographically or take the form of outlets or second-hand markets. In some cases, firms may choose donation as a disposal option to enhance corporate reputation.
- **Develop a Framework of Metrics**: The development of a metrics framework to evaluate returns management performance represents a fundamental element of strategic management.

2.2.1.1 Metrics framework in returns management

Examples of basic metrics for evaluating returns management include Neil T. Bendle et al (2016), Derek Voigt et al. (2019), Wibowo, M. A. (2022):

- Return cycle time, measured from customer delivery to resale, supplier return, recycling, or disposal;
- Product recovery rate;
- Return rate relative to sales;
- Average time between return request and refund issuance;
- Percentage of value recovered from returns;
- Average time to refund for items that are resold;
- Revenue generated from the resale of returned items, net of refurbishment or repackaging costs;
- Handling and transportation costs per returned item;
- Lost sales commissions and fees;
- Disposal costs per item;
- Sustainability indicators, such as the quantity of waste generated per return.

Ivan Russo (2008) proposes a detailed set of indicators, including measures of effectiveness and efficiency.

With respect to **effectiveness**, indicators include:

- The number of returns received within a given period, clustered by return condition (e.g. defective vs non-defective, under warranty vs out of warranty) and product type;
- The total number of returned units relative to shipped or sold products, segmented by return category and condition;
- The number of units processed by returns management personnel within a given period.

With respect to **efficiency**, indicators include:

- Labour cost per processed unit;
- Number of employees (full-time or part-time) involved in the process over a given period;
- Units processed per hour, day, or week;
- Percentage of units collected, transported, received, sorted, reworked, repaired, recycled, or disposed of within a given period;

- Ratio of returned products to sold products;
- Percentage of products not processed within a predefined standard time;
- Percentage of authorised returns actually received;
- Condition of packaging upon receipt;
- Warehouse space occupied by returned goods;
- Sorting accuracy;
- Processing time required for each activity;
- Economic value of recovered units relative to total returned units;
- Total warehouse cost per return;
- Transportation cost per recovered return;
- Percentage of resources allocated to return recovery;
- Number of customer complaints related to returns processing.

2.2.1.2 The SCOR model and performance attributes

The Supply Chain Operations Reference (SCOR) model, developed by the Supply Chain Council, represents a widely adopted framework for analysing and improving supply chain performance. The model identifies five primary management processes—Plan, Source, Make, Deliver, and Return—and provides a standardised language for describing supply chain activities and performance metrics.

Within the SCOR (12.0) APICS framework, **Returns** constitute a core process, highlighting the strategic relevance of returns management within the overall supply chain. The model defines specific performance attributes through which supply chain processes, including returns, can be evaluated. These attributes include:

- **Reliability**, measured through indicators such as return accuracy and the percentage of returns processed correctly;
- **Responsiveness**, referring to the speed at which return processes are executed, including cycle times from return request to refund or resolution;
- **Agility**, defined as the ability of the returns system to respond to fluctuations in return volumes, particularly during peak periods;
- **Cost**, encompassing all costs associated with returns management, including transportation, handling, processing, refurbishment, and disposal costs;
- **Asset management efficiency**, which measures the effectiveness with which assets tied up in returned inventory are utilised and recovered.

By integrating returns into the SCOR model, firms are encouraged to view returns management not as a peripheral activity, but as a critical component of supply chain performance and competitiveness.

SCOR metrics are organised within a hierarchical structure comprising **Level 1, Level 2, and Level 3** metrics, with **diagnostic relationships** between these levels. Level 2 metrics serve as diagnostic indicators for Level 1 metrics. This implies that, by analysing the performance of Level 2 metrics, it is possible to explain performance gaps or identify opportunities for improvement in Level 1 metrics. Similarly, Level 3 metrics act as diagnostic tools for Level 2 metrics. The hierarchical level of each metric is embedded within the metric's coding structure.

This approach can be generalised to all performance metrics, regardless of whether they are explicitly included within the SCOR framework. Specifically, Key Performance Indicators (KPIs) can be organised hierarchically across multiple levels, such that lower-level metrics explain and support higher-level metrics. This hierarchical structuring enables a more in-depth evaluation of process effectiveness and efficiency, facilitating the identification of variables that generate inefficiencies and allowing firms to intervene strategically on these variables.

2.2.2 Operational sub-processes in returns management

Operational sub-processes translate the strategic guidelines defined at the managerial level into day-to-day activities. According to Rogers et al. (2002), these sub-processes include the following stages:

- **Receive return request**: The process begins when the customer initiates a return request. At this stage, gatekeeping activities are crucial. The firm must verify whether the return complies with its return policy, whether the product is eligible for return, and whether alternative solutions, such as technical support or product replacement, can resolve the issue without requiring a physical return.
- **Determine routing**: Once the return request is authorised, the firm determines the most appropriate routing for the returned product. This decision depends on factors such as product condition, value, return reason, and geographical location. Products may be routed to distribution centres, dedicated return centres, third-party logistics providers, repair facilities, or recycling centres.
- **Receive return**: Upon physical receipt of the returned product, the item is registered in the system, inspected, and classified according to predefined criteria (e.g. new, used, damaged,

defective). Accurate and timely data capture at this stage is essential to enable subsequent recovery decisions.

- **Select disposition**: Based on inspection results and established disposition guidelines, the firm determines the most suitable recovery option. Possible dispositions include resale as new or refurbished, return to supplier, repair, recycling, donation, or disposal.
- **Issue credit**: Following disposition selection, the firm issues the appropriate credit to the customer in accordance with its credit rules. Speed and transparency in this stage are particularly important, as delayed refunds may negatively affect customer satisfaction and brand perception.
- **Analyse returns and identify improvement opportunities**: Data collected throughout the operational process are analysed to identify recurring issues, root causes of returns, and opportunities for process improvement, return avoidance, and policy refinement.

Figure 7 shows that these operational sub-processes require coordination across multiple functions, including customer service, logistics, warehousing, finance, and information systems, highlighting the cross-functional nature of returns management.

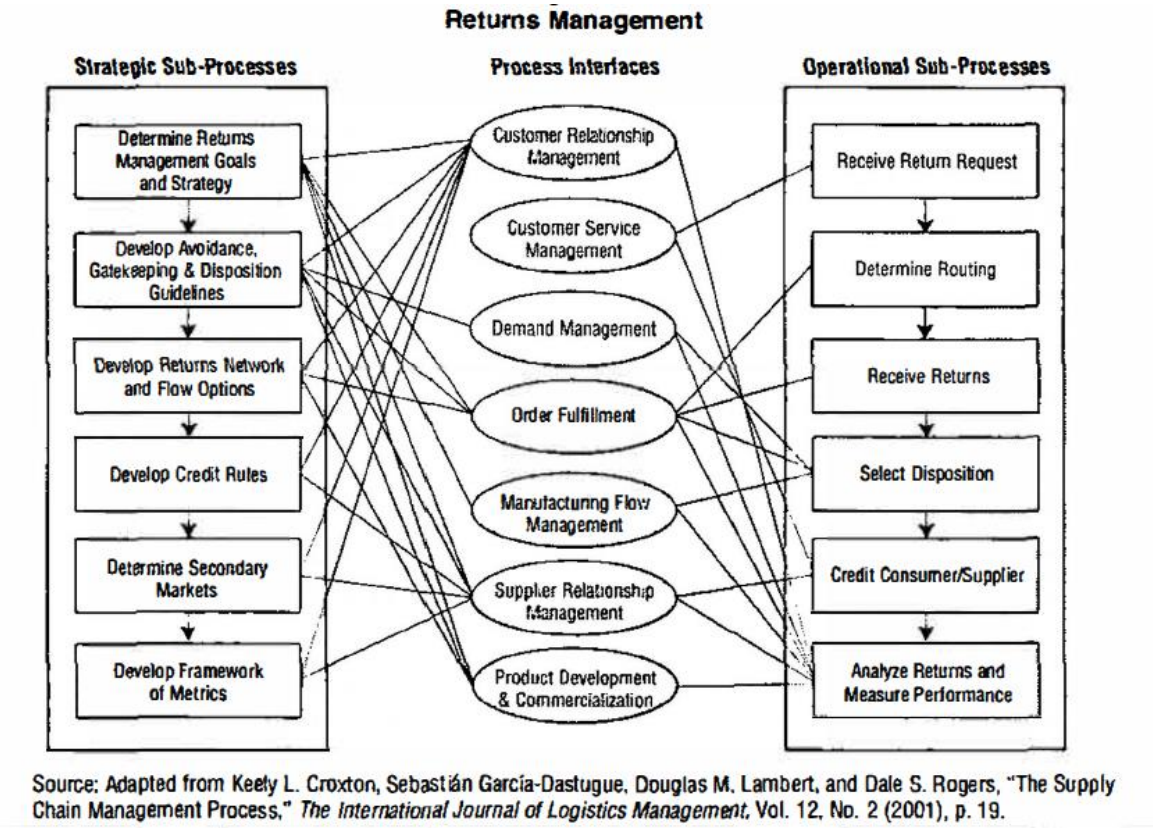

Fig.7 Return management process

2.3 Example of a returns process: the Amazon case

Following the general overview of returns management, it is appropriate to illustrate a concrete returns process as implemented by a leading company in the sector. For this purpose, reference is made to an article written by **Gopal Pillai**, Vice President, Worldwide Returns and ReCommerce at Amazon (21 December 2023).

When a customer wishes to return a product, Amazon's mission is to give the item a second life and maximise its reuse, while minimising waste as much as possible. Amazon structures the returns process into five main phases.

Phase 1: Free product and customer support (return avoidance)

Amazon is committed to helping customers find the product that best suits their needs. To this end, it has introduced features such as the *"Frequently Returned Item"* and *"Frequently Kept Item"* badges, as well as programmes such as **Virtual Try-On** for shoes and eyewear.

In addition, Amazon provides free post-purchase customer support, assisting customers with product setup, usage, and troubleshooting. Depending on the product, customers can contact Amazon Customer Service via phone or chat, access manufacturer contact details, view detailed troubleshooting instructions, coordinate the replacement of missing or damaged parts, or obtain other forms of support. These options are available for eligible items through the *"Your Orders"* page by selecting *"Get Product Support"*. If customers remain dissatisfied, they may request replacements or exchanges for eligible products.

This phase represents a **return avoidance** activity, as described in Section 2.1, and aims to improve customer knowledge of the product. Inadequate product understanding may generate unrealistic expectations, leading to dissatisfaction, product returns, and potentially customer churn, with a consequent loss for the company.

Phase 2: Product return (reverse logistics)

If a customer decides to return an item, Amazon offers more than 8,000 drop-off locations across the United States. Four out of five customers have a return drop-off point within an 8-kilometre radius of their home. These locations include Amazon's physical stores, such as **Whole Foods Market**, **Amazon Fresh**, and **Amazon Go**, as well as partner locations including **Staples**, **Kohl's**, and **The UPS Store**.

To further simplify the return process, Amazon has designed a system that minimises the need for additional shipping boxes: eligible items may be returned in their original manufacturer packaging. Many Whole Foods Market locations in the United States also feature Amazon return kiosks, allowing customers to complete returns in 60 seconds or less. Given customers' expectations for rapid refunds, Amazon has made significant efforts to ensure that the vast majority of eligible refunds are issued within five hours.

This phase is part of the strategic sub-process **"Develop Returns Network and Flow Options"**, as described in Section 2.2.1.

Phase 3: Returned items are sent to Amazon facilities (reverse logistics)

Items handed over for return are consolidated with other returned products and routed to an Amazon returns centre. Amazon returns centres are dedicated facilities designed to handle specific product categories, such as apparel, electronics, or furniture and household appliances.

This phase is also part of the strategic sub-process **"Develop Returns Network and Flow Options"** outlined in Section 2.2.1.

Phase 4: Inspection of returned items (gatekeeping)

Each item received at an Amazon returns centre is carefully inspected and assessed to determine whether it meets Amazon's stringent requirements for resale. Initially, all sides of the original packaging are examined to identify any damage or broken seals. Subsequently, the item inside the packaging is inspected to verify that it matches the product description, to check for signs of wear, and to assess any damage to the product itself.

Depending on the condition of the returned item, several pathways may be followed. The majority of returns are resold as new or used, returned to selling partners, disposed of, or donated. If an item does not meet Amazon's high standards to be reshelved and sold as new, it may be eligible for sale at a reduced price through **Amazon Resale**. With the advantages of Amazon shipping, customer service, and convenient returns, Amazon Resale offers customers attractive deals on high-quality used, pre-owned, or open-box products.

Before an item can be sold through Amazon Resale, a second inspection is carried out to carefully verify its condition and provide a detailed description, enabling customers to make informed purchasing decisions. For electronic items, the evaluation process includes powering on, functional testing, and restoring factory settings. Based on quality control outcomes, each item is assigned one

of four sales conditions: *"Like New"*, *"Very Good"*, *"Good"*, or *"Acceptable"*. Customers can find these offers via the Amazon Resale storefront, the search bar, or product detail pages.

For items that do not meet Amazon's quality standards for resale, Amazon collaborates with specialised providers to repair certain returned products (such as televisions or laptops) so that they can be remarketed. According to Amazon's latest Sustainability Report, more than **7.6 million products** were repaired in the United States and Europe in 2022 through repair partners.

This phase constitutes a **gatekeeping** activity, as discussed in Section 2.2, and forms part of the operational sub-process **Receive Returns**, described in Section 2.2.2.

Phase 5: Products are given a second life through donations (disposal)

In some cases, products cannot be resold for various reasons, such as damaged packaging, yet still retain substantial usable life. In these situations, items may be donated to families and individuals in need through the non-profit partner **Good360**. Through this partnership, Amazon donates items to more than 700 non-profit organisations across the United States. Donated products include household appliances, tools, school supplies, electronics, and clothing. When products cannot be resold, returned to selling partners, liquidated, or donated, recycling options are pursued wherever possible.

This phase is part of the operational sub-process **Select Disposal**, as described in Section 2.2.2.

2.4 – The cost of returns and financial aspects

One of the first elements to be defined when evaluating the economic and financial aspects of returns management is the determination of the **cost of returns**, in order to understand the consequences of adopting more or less customer-friendly return strategies. On the one hand, permissive return policies benefit customers and tend to have a positive effect on sales; on the other hand, the costs associated with returns erode profits due to the increase in returns management costs. Offering generous return policies increases operating costs, as each return triggers a returns management process that, depending on the industry, product type, and product value, may cost the retailer up to 100% of the item's original value.

The objective is therefore to identify an appropriate **break-even point** for return policies and to design an intelligent and sustainable business model, which is likely to vary according to different product categories. Returns management must be handled carefully, as errors may generate negative

effects for both customers and firms from an economic perspective. By way of example, returns may negatively affect inventory management—rendering stock data unreliable—create uncertainty regarding logistics capacity, and distort procurement decisions.

In the United States, no federal law regulates product returns. With the exception of certain state-level regulations requiring retailers to disclose their return policy prior to transaction completion, sellers are generally free to define their own policies. In other words, retailers may refuse returns, charge restocking fees, or withhold shipping cost refunds. In contrast, the European Union (Directive 2011/83/EU, transposed in Italy through the Consumer Code) grants consumers extensive withdrawal rights. With few exceptions, consumers may withdraw from a purchase for any reason within 14 days. Retailers are required to fully refund the buyer, including the shipping costs paid (Bjorn Asdecker, 2015). Under European legislation, return shipping costs are generally borne by the consumer, unless the retailer offers free returns. If the retailer has not specified in advance who bears the return costs, these costs must be borne by the retailer. The right of withdrawal does not apply to perishable goods, sealed goods opened for hygiene or health reasons, contracts for urgent repair services, services already fully performed, digital content not supplied on a tangible medium once execution has begun, hotel reservations, or airline tickets.

Cost components of returns management

Returns management costs can be classified into:

- **Direct costs**, such as shipping costs, direct gatekeeping costs, and potential disposal costs;
- **Indirect costs**, such as customer service resources dedicated to handling returns and the loss of customer trust when the return process is poorly managed.

There are also costs that are more difficult to quantify, such as the impact on brand reputation and inventory management costs arising from excess stock resulting from returned products.

Conceptually, Rogers et al. (2002) describe the returns management process in a way that allows the identification of its cost components, which include the following.

Customer delivery and transportation costs

The returned product may be collected directly by a carrier or delivered by the customer to a peripheral collection point, from which it is transferred to the manufacturer or the retailer's collection centre. These operations primarily involve labour costs for handling, fuel costs, and depreciation costs for transport vehicles and equipment. As the parties involved (e.g. collection

centres, carriers) are often third parties relative to the retailer, these costs can be evaluated through contractual arrangements. For example, some retailers require customers to deliver products to Poste Italiane (or another appointed carrier), which handles shipment to the manufacturer or retailer's return centre. In other cases, customers return products to designated retail stores, from which they are collected by carriers, while for bulky products the carrier may collect the item directly from the customer's home. To ensure that customers can track return shipments, retailers must integrate data from multiple carriers, each operating its own information system. Developing and managing these integrations is technically complex and costly.

Warehouse receiving and handling

This category includes all costs related to returned products, as they must be received, inspected, and tested (gatekeeping), repackaged (if eligible), and shipped back to the retailer, repaired and reshipped, recycled, or sent for disposal. These processes naturally involve additional transportation costs. Warehouse operations require warehouse staff, quality control teams, dedicated space, and in some cases specialised technicians. These activities are labour-intensive and represent the core of returns management. They also require physical storage space and inventory management operations, thereby engaging warehouse personnel in both inbound and outbound activities.

Refunds

In addition to physical handling costs, returns generate profit losses. Not only is the sale cancelled and the purchase price refunded, but hidden losses also arise in terms of handling fees, increased working capital tied up in inventory, distorted demand forecasting, and unrecoverable discounts and promotions. Furthermore, frequent returns may affect revenue figures and sales reporting, making it necessary to properly account for returns in financial statements.

Customer support services

Returns often require customer support interactions, generating communication costs (email, telephone, chat). Each return typically requires dedicated support time, return labels, or follow-up activities to ensure customer satisfaction.

Return avoidance costs

Return avoidance includes all proactive measures aimed at eliminating the reasons why products are returned. Examples include improving product quality, simplifying the product range, reducing delivery times, providing comprehensive product information, and offering financial incentives that encourage more informed purchasing decisions.

Product depreciation

Returned products frequently lose value. The most affected categories include seasonal products, products subject to rapid technological obsolescence, damaged goods, perishable products, items that cannot be refurbished for hygiene or safety reasons, and products with short life cycles. Such products may only be resold at a reduced price or may lose their market entirely, forcing retailers to write down inventory values and incur profit losses.

Costing models for returns management

Once the main cost components associated with returns management have been identified, some variable (e.g. transportation costs, refunds) and others fixed (e.g. customer support costs, warehouse receiving), an appropriate costing model must be applied. Product costing models can be classified into:

1. **Direct costing systems** (contribution margin);
2. **Traditional absorption costing systems**;
3. **Activity-Based Costing (ABC) systems**.

Direct costing systems assign only direct costs to cost objects. As indirect costs are not allocated, such systems may be insufficient for strategic evaluation of return costs. Indeed, direct costing is recommended only when indirect costs represent a small proportion of an organisation's total costs (Colin Drury, 2021). In returns management, however, indirect costs often account for a significant share of total costs. This methodology has been applied by only a limited number of authors, including Bjorn Asdecker (2015), who analyses the relationship between return rates and associated costs, the number of orders required until final sale, and the number of returns required until final sale. The contribution margin for each item is obtained by subtracting the marginal return cost—adjusted for the return rate—from the contribution margin of the sale (price minus variable cost). This model addresses questions such as: *What is the minimum increase in orders or sales required to justify an increase in the return rate from β to β'?*

Traditional costing methods, which are full costing systems, calculate variable product costs and allocate overheads using a single allocation base, or divide the firm into direct and indirect cost centres, with indirect costs allocated to direct centres and subsequently to products using appropriate allocation bases (e.g. labour hours) (Giuseppe Lo Martire, 2016). No studies applying traditional costing methods to returns management were identified.

Activity-Based Costing (ABC) is a full costing approach aimed at determining product costs, based on the assumption that activities consume resources and therefore generate costs for products. Under ABC, the activities required to process a product return are first identified, followed by the determination of the costs of these activities, which are then allocated to products using appropriate cost drivers. ABC has been widely applied to returns management cost analysis (Stock, 1998; Autry et al., 2001; Roztocki, 2010; Aksoylu et al., 2018; Nguyen et al., 2024; Goldsby et al., 2000).

Empirical evidence and financial implications

With reference to Italy, and specifically to Milan, focusing solely on customer delivery and transportation costs to the collection point, Arianna Seghezzi et al. (2021) estimate an average return cost of **EUR 2.78 per parcel**, of which 42% relates to labour costs, 34% to transportation vehicle costs, and 24% to pickup and delivery costs. This estimate does not include other relevant costs, such as gatekeeping, repackaging, repair or disposal, reshipment to the retailer, additional transportation, or fixed costs. Nevertheless, it provides an indicative lower-bound estimate of returns management costs in the Italian context. From a financial perspective, excessive return volumes may have a significant impact on a firm's **cash flow**, particularly in terms of liquidity relative to forecasts. This is due to the time required to resell or recycle returned products, if they are not donated or disposed of,while customers are refunded within a short time frame. This creates a temporal mismatch between cash outflows and inflows, increasing liquidity requirements and potentially resulting in outright losses when product value is lost, especially during peak periods such as the Christmas season.

To plan cash flow effectively, firms must forecast returns by product type and, preferably, by return category (resellable without loss of value, resellable with loss of value, recyclable, donatable, or to be disposed of in landfill). Although many authors have addressed return forecasting, they often do not analyse return categories or their specific cash flow implications. A comprehensive review of return forecasting models can be found in David Karl (2024).

Finally, a major challenge in evaluating return costs for many firms is the **availability of reliable cost data**. Frei et al. (2020), based on interviews with returns managers, highlight a general lack of reliable cost data related to returns. Firms are often unable to track products sold in-store or online across multiple return channels, and available statistics are typically incomplete, fragmented, managed by different departments, inconsistently monitored, and not communicated effectively to senior management. Frei et al. (2020) estimate that for an average firm, even a **5% improvement in the return rate** could potentially generate a **200 basis point (2%) increase in net margin** (Net Income divided by Total Revenue).

Chapter 3 – The Consumer in the Digital Era

3.1 From the Traditional Consumer to the Consumer of the Digital Era

The use of the internet has marked an epochal change in the consumer, who has shifted from a passive subject to an active one in relation to purchasing choices (Philip Kotler et al., 2017). The traditional consumer was characterized by:

- Limited information about products, which in practice constrained the concept of perfect competition; consumers had to rely on information available within a limited physical space or through limited word of mouth, involving only a few individuals, or on advertising, which essentially constituted the main source of information about market offerings.
- A predominantly passive role with limited opportunities for comparison.
- Top-down communication from the seller, with no interaction with the consumer.
- Centrality of the brand, whereby trust was based solely on brand awareness, making advertising the key element.
- Long waiting times when products were not ready for immediate delivery, and delivery times did not represent a competitive factor.
- Standardized offerings and coarse customer segmentation.
- Limited product variety due to the physical constraints of store space.
- Consumer choices not visible externally and therefore not mutually influential among consumers.
- A private post-purchase phase, resulting in an almost negligible impact on other consumers.

The transition from the traditional consumer to the digital consumer has overturned all the aspects described above; thus, the change has not only been technological but also cultural, in the sense that the consumer has transformed from a passive subject into an active element of a community. Purchasing has become a public act that creates relationships between the customer and the seller, as well as among customers themselves, and also relationships among sellers, who have access to online data from other vendors.

In particular, the digital consumer is characterized by:

- Abundant and timely information from multiple sources such as reviews, average customer ratings, forums, social networks, and others. Decision-making power shifts toward the consumer, who expresses approval or disapproval of products, thereby reducing information asymmetry between seller and consumer. Although this implies choices based on greater

knowledge, it also creates information overload, leading to the need to filter information—for example, through algorithmic choices or closer analysis of negative reviews.

- An active and participatory consumer role; interaction between seller and consumer becomes more transparent and concerns both the sales and post-sales phases.
- Communication that shifts from top-down to bidirectional and public.
- Alongside the continued importance of brand and advertising, there is added centrality of reviews, community, digital word of mouth, and influencers, resulting in trust being more widely distributed between seller and consumer.
- Waiting times for products and services become a competitive factor for companies that offer increasingly shorter delivery times.
- Advanced personalization of offerings and data-driven strategies (based on user behavior, tailored offers for individual customers, and real-time monitoring and adjustment of sales strategies based on collected information).
- Availability to customers of a very wide range of products due to the removal of physical store space constraints (it is worth recalling that Jeff Bezos defined his e-commerce site as "the largest bookstore in the world"). Simultaneous access to multiple stores for real-time comparison.
- Shared purchasing choices that are externally visible in quantitative terms through sales counters.
- Post-purchase experiences documented through reviews and public feedback, which have a significant impact on consumers.

3.2 Consumer Behavior with Respect to Return Policies

Among the factors influencing online purchases, return policies have increasingly become a crucial element in encouraging consumers to buy, maintaining their trust, and minimizing the risk of making a poor choice. For certain products, such as made-to-measure or apparel items, return policies are strategic; indeed, without an easy and free return policy, many customers would understandably refrain from purchasing clothing online. While the practice of returning a product for exchange or refund represents a strategic lever to increase sales, it simultaneously entails higher operational, logistical, and environmental costs, which can become significant depending on consumer behavior. It is therefore necessary to establish a balance between the advantages and disadvantages of return policies, maximizing benefits for the firm while still considering consumer benefits, in order to maximize long-term corporate value.

Aruna Desai et al. (2020) conducted a study aimed, among other objectives, at analyzing the effects of online returns on customers and supply chain management, as well as evaluating the reasons for returns. Their findings show that 84% of respondents believe that return policies influence purchase decisions. The main reasons for returns include:

- Products received damaged (during shipping) in 23% of cases;
- Products that do not match or meet expectations or requirements in 19% of cases;
- Returns due to impulsive purchasing decisions in 16% of cases;
- Delayed deliveries for various reasons in 18% of cases.

A review of the literature indicates that one of the most significant causes of returns is related to logistical issues (delays, damage), while another major cause stems from inaccurate product representation on websites, which leads to unmet expectations or encourages careless purchasing decisions.

Customer return behavior is not uniform across products. In some sectors, such as fashion, return rates are higher due both to the intrinsic characteristics of the products and to opportunistic consumer behavior or other reasons investigated by Hannu Saarijärvi et al. (2017) through unstructured questionnaires. The authors conclude that permissive return policies encourage unnecessary orders, leading to opportunistic purchasing behavior and excessive return rates. As confirmed by other scholars, while in some cases returns are unplanned—for example, when consumers are simply dissatisfied with the product's appearance or functionality—in other cases returns are planned, meaning that the decision to return is made before the order is placed and may even take on unethical characteristics.

Regarding consumer behavior, Pei and Paswan (2018) classify customer behavior as either legitimate or opportunistic. Hannu Saarijärvi et al. (2017) identify several categories of customer behavior that can be divided into planned and unplanned, which largely correspond to opportunistic and legitimate behavior, respectively. In particular:

Unplanned behavior

- Consumers return items because the product is defective;
- The wrong product is delivered (e.g., incorrect color, size, or item);
- While waiting for delivery, the customer finds the same product more quickly or at a lower price at another retailer;

- The product does not meet the expectations formed at the time of ordering;
- The product size is incorrect, even though the customer ordered their exact size;
- For some reason, the customer does not feel “comfortable” when wearing the product;
- The customer ultimately lacks the financial means to keep all ordered products or is unwilling to spend that amount;
- Upon delivery, the customer realizes that the product is not actually needed.

Planned (opportunistic) behavior

- The customer orders multiple products with the intention of keeping only one or a few (different sizes, colors, or alternative products);
- The customer orders products with no intention of keeping any of them (ordering for fun or simply to try them out);
- The customer orders additional products to qualify for free shipping and then returns the extra items.

In light of these findings, the authors propose several return management strategies, including:

- Supplier quality audits;
- Audits of opportunistic customer behavior;
- Analysis of delivery errors;
- Incentives for error-free deliveries;
- Faster delivery times;
- Providing comprehensive product images;
- Improved product descriptions;
- Clear size charts (including equivalence tables with other sizing systems);
- Using models in product images;
- Installment payment options;
- Rewarding customers with a certain number of purchases without returns.

Younger age groups are undoubtedly the most active in online shopping (Fig. 8, Fig. 9); therefore, several authors have focused on the reasons why younger consumers return products. Lipsa Das et al. (2024) examined product return behavior among young consumers, particularly Generation Y (born 1980–1996) and Generation Z (born 1997–2012). To this end, they employed three qualitative data collection techniques: in-depth interviews (offline), focus group discussions (offline), and netnography (online).

Individual profile breakdown	Value	Code
EU	77	IND_TOTAL
16-24 years	83	Y16_24
25-34 years	89	Y25_34
35-44 years	86	Y35_44
45-54 years	78	Y45_54
55-64 years	67	Y55_64
65-74 years	53	Y65_74
Males	77	M_Y16_74
Females	77	F_Y16_74
no or low formal education	58	I0_2
medium formal education	76	I3_4
high formal education	89	I5_8
Nationals of another EU country	75	CC_EU_FOR
Nationals of a non-EU country	68	CC_EXT_EU
Nationals	77	CC_NAT
Individuals living in cities	78	IND_DEG1
Individuals living in towns and suburbs	76	IND_DEG2
Individuals living in rural areas	75	IND_DEG3
Employees, self-employed, family workers	83	SAL_SELF_FAM
Students	82	STUD
Unemployed	68	UNE
Retired or not in the labour force (excluding students)	59	RETIR_OTHER

Source: Eurostat (online data code: isoc_ec_ib20)

eurostat

Fig.8 Profile of internet users who bought or ordered goods or services for private use, EU, 2024

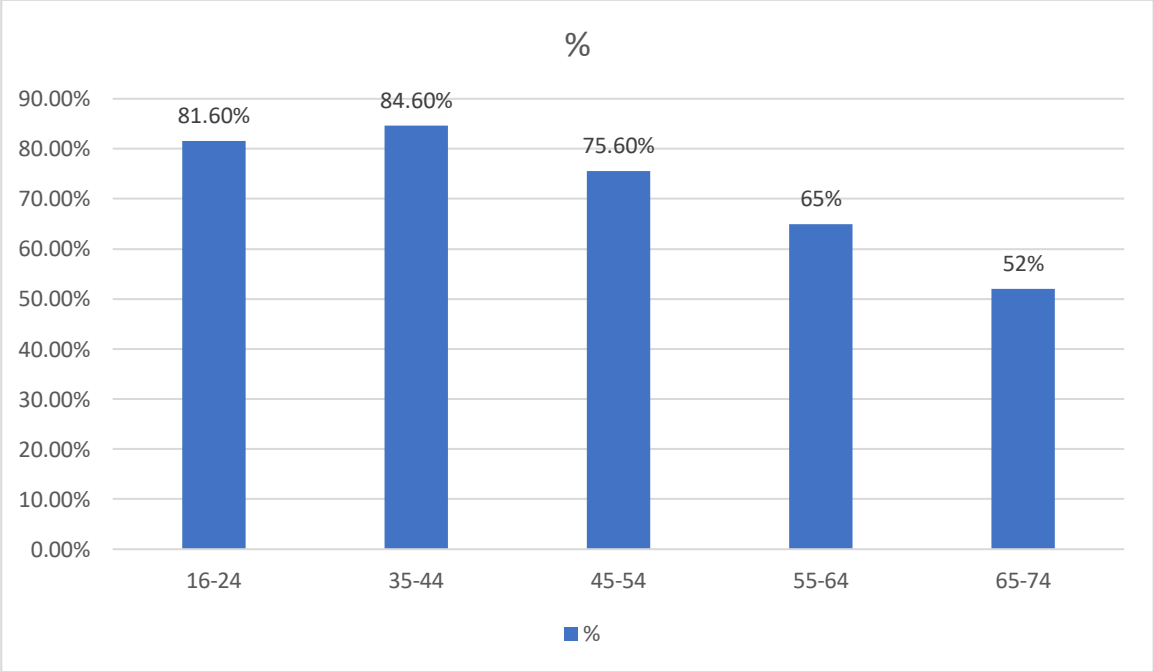

Fig.9 Percentage of internet users who make online purchases by age group in 2023 (https://www.consilium.europa.eu/it/infographics/e-commerce/#0)

In particular, they identified the following classes of motivation:

- **Unsuitable product**: product mismatch, counterfeit product, low-quality product, damaged product;
- **Compromised delivery**: delayed delivery, delayed delivery in urgent situations, improper handling of the product, poor packaging;
- **Manipulated information**: tampered information, inadequate information, unclear terms and conditions, ambiguous refund practices;
- **Misleading advertising**: inaccuracies, misleading or false information;
- **Buyer's remorse**: unmet expectations, negative experiences with the staff involved;
- **Wardrobing** (ordering to try on, ordering to use once or to take photos for social media — "snap and send back");
- **Bracketing**: purchasing multiple sizes or styles with the intention of returning those that do not fit (Joshua Marriott et al., 2025);
- **Compulsive buying** (impulse purchasing, peer influence).

In addition to the above classes of motivation identified by the authors, the following explicitly fraudulent motivations should be considered:

- **Bricking**: expensive electronic devices are particularly vulnerable to bricking, which occurs when a customer removes valuable components from a purchase or otherwise alters it, rendering it non-functional. The customer then attempts to return the item, claiming it is intact; however, because it no longer functions properly, it cannot be restocked and resold;
- **Empty box**: returning a box with no product inside (or replacing it with an item of similar type and weight) while claiming to have made a legitimate return is a very common practice. Fraudsters use anything from a stone to a piece of trash to achieve this;
- **Switch fraud (or "item swapping")**: purchasing an original product, replacing it with a cheaper or counterfeit version, and returning the fake while keeping the original;
- **Friendly fraud / chargeback abuse**: occurs when a customer claims that a product never arrived or was defective and requests a refund or files a chargeback through their bank or credit card provider.

Within the above list, it is possible to distinguish between motivations centered on the company and motivations centered on the customer. Based on this distinction, the following hierarchy has been developed in order of importance:

Motivations not centered on the customer

1. Unsuitable product
2. Compromised delivery
3. Manipulated information
4. Misleading advertising

Customer-centered motivations

1. Buyer's remorse
2. Wardrobing
3. Bracketing
4. Compulsive buying
5. Other fraudulent behaviors as described above

Taking this classification into account, companies can implement appropriate strategies to reduce returns, some targeting internal management processes and others focusing on customer behavior.A permissive return policy may appear advantageous for a company because it reduces the customer's perceived risk associated with purchases, leading to a more positive customer perception and a higher propensity to buy (Rokonuzzaman et al., 2021). This issue has also been addressed quantitatively by Debabrata Das et al. (2022) through the application of Kahneman and Tversky's prospect theory.

It can therefore be stated that a permissive return policy increases sales levels, but at the same time imposes additional managerial, economic, and financial burdens on the company. Consequently, return policies must be calibrated in such a way as to strike the right balance between increased sales and the costs incurred by the firm relative to profits.

It has been observed that customer return rates are not constant but vary over time. Therefore, an important element for firms is the evolution of the customer's return rate, as it influences the contribution margin of the products sold.

S. El Kihal et al. (2025) analyze data from a European premium single-brand online apparel retailer over a six-year period, from April 2009 to April 2015, covering a wide range of product categories, including shoes and accessories. The company's return policy is more permissive than legally required, allowing free returns of unused products with a full refund within 30 days for any reason. In their study, the authors capture customer return behavior through the share of items returned by a customer relative to all items purchased or ordered at purchase occasion *t*:

$$\frac{\text{number of items returned by customer } i \text{ at purchase occasion } t}{\text{number of items purchased by customer } i \text{ at purchase occasion t}}$$

In their analysis, the authors assess: the effect of brand experience, which leads to a reduction in return rates; the effect of return habit, which results in an increase in return rates; and the effect of relationship duration, which is not found to be particularly significant with respect to return rates. Based on the analyzed data for a single-brand retailer, the effect of return habit (the more products a customer has returned, the more likely they are to return additional products) outweighs the effect of brand experience, thereby exerting a negative impact on the contribution margin per purchase.

I therefore infer that by acting on internal business processes to reduce returns due to defects, product mismatch, compromised delivery, manipulated information, and misleading advertising, it is possible to reduce the customer's return habit. This leads to a double effect on return rates: a first effect resulting directly from interventions in business processes that influence "non-customer-centered motivations," and a second effect whereby the reduction in returns weakens the consumer's habit of returning purchased products, thus lowering their psychological propensity to return items. Naturally, the issue of so-called planned returns remains; since these stem from a deliberate opportunistic attitude, they must be addressed through appropriate customer disincentives.

From the above discussion, it can be concluded that product returns are attributable partly to company responsibilities in logistics and communication management, partly to opportunistic customer behavior, and partly to psychological factors such as buyer's remorse, compulsive purchasing, and the customer's habit of returning products.

Chapter 4 – Strategies and Practices for Returns Management

4.1 Strategic Objectives in Returns Management

As discussed in the previous sections, returns represent a major issue for e-commerce distributors compared to traditional retailers. In fact, partly due to difficulties in information exchange and the depersonalisation of the customer–seller relationship, customers return more products than in traditional transactions.

With regard to the flow of products to customers, retailers can accurately forecast product ranges and quantities based on expected demand, which allows them to optimise processes and achieve economies of scale (Lindsey, 2016). Returns, by contrast, are difficult to predict, making the organisation of reverse logistics more complex. Reverse logistics is generally associated with high costs; indeed, product returns are three to four times more expensive than downstream shipments (Kiro, 2015).

From a strategic perspective, two objectives can be identified that companies must pursue:

- reduction of costs in managing returns;
- maximisation of customer satisfaction, which corresponds to an increase in the number of customers as churn decreases, leading to higher sales.

These objectives may, however, conflict with one another. Discouraging customers from returning products by making the process more costly and complex may reduce return-related costs, but at the same time it lowers customer satisfaction, leading customers to purchase less or even to stop buying from that retailer altogether. Conversely, adopting a highly permissive return policy increases customer satisfaction and may encourage purchases by reducing perceived risk, but it also raises returns management costs, which may erode sales contribution margins.

From these objectives derive the three types of return policies identified by Röllecke et al. (2017):

- Type I: cost-focused
- Type II: balanced between costs and customer satisfaction
- Type III: customer satisfaction–focused

4.2 Types of Return Policies

4.2.1 Type I – Cost-focused

The objective of this policy is to reduce the volume and cost of product returns, even at the expense of customer satisfaction. This is achieved, for example, by adopting complicated and inconvenient return procedures or by charging customers for returns in order to discourage them from sending products back. Although this policy reduces the volume and cost of returns, it simultaneously lowers customer satisfaction and may result in the loss of customers.

Companies adopting this approach view returns simply as a handling cost that must be minimised. Customers are discouraged from returning items due to costs (e.g. various fees) and inconveniences (e.g. a complex return process or limited refund options). These companies generally do not track the reasons for returns (or make only limited use of such information) and do not maintain a database linking returns to customers. As a result, profitable customers are treated in the same way as less profitable or fraudulent ones.

The study reports that requiring consumers to pay for returns reduces post-return spending with the main retailer by between 75% and 100%. However, it also identifies the negative impact of Type I return management programmes on customer satisfaction and purchasing rates. Type I policies are usually adopted by small online retailers, although some major brands such as Apple and Zulily have also implemented this approach.

4.2.2 Type II – Balanced between costs and customer satisfaction

These programmes adopt a more balanced approach to returns management. Customers experience a combination of procedures that may be either restrictive or customer-friendly, depending on whether they are responsible for the return. Also known as *"fairness-based return shipping policies"*, these programmes apply different levels of cost depending on the customer's responsibility for the return.

For example, free return shipping may be guaranteed to customers who received an incorrect, damaged or defective item due to a company error. However, for all other items, non-refundable return shipping costs may be charged, consisting of a fixed shipping fee plus an additional handling charge deducted from the customer's refund.

Type II programmes are generally applied to products with low contribution margins for sellers, such as consumer electronics. These programmes require a high degree of creativity on the part of retailers. Measures may include discouraging returns based on customer reliability, offering vouchers if customers forgo returning items, issuing store credit instead of cash refunds, or closing accounts of

customers with high return rates or improper behaviour—although such actions have, in some cases, caused media backlash.

These policies require significant development effort to balance both objectives, as well as continuous monitoring and data analysis to assess results.

4.2.3 Type III – Customer satisfaction–focused

These policies are used by companies that believe being lenient and customer-oriented in returns management leads to increased sales whose contribution margins outweigh the additional costs generated by higher return volumes. This approach is typically applied to products with high contribution margins.

Companies do not adopt active measures to limit returns, as in Type I policies, but instead implement so-called *"passive"*, non-coercive measures aimed at reducing the quantity and cost of returns, based on the assumption that satisfied customers will continue purchasing, thereby fostering loyalty. Examples include more effective product presentations, marketing optimisation based on customer profiling, improved collection, transport, gatekeeping and refurbishment processes, or recovery through secondary markets.

The choice of return policy type also depends on the product category and its value. In the apparel sector, for instance, the nature of the product requires retailers to adopt a Type III policy, as online customers cannot try on garments or assess quality through touch. Passive measures are therefore adopted to limit returns, such as size conversion charts, customer support chats, images and detailed descriptions.

Type III programmes require a wide range of passive measures to reduce returns, customer profiling to prevent abusive behaviour, attention to competitors' practices, database maintenance, continuous performance measurement, and ongoing monitoring of key performance indicators.

4.3 Evaluation of Return Policies

The two objectives—*"reduction of costs in returns management"* and *"maximisation of customer satisfaction"*—have a direct impact on company profitability and, in general, should be appropriately balanced. However, the level of balance depends on the industry and the type of product. Clearly, a policy oriented solely towards maximising customer satisfaction may, on the one hand, increase sales volumes, but on the other hand generate return-related costs that may exceed the increase in

contribution margin resulting from higher sales. Therefore, it is necessary for the contribution margin of the products sold to be sufficiently high. Conversely, a policy focused exclusively on reducing the costs of managing returns would lead to customer dissatisfaction, which may ultimately result in customer loss.

It is therefore necessary to identify the appropriate level of customer satisfaction that corresponds to a level of sales and return management costs capable of ensuring maximum profitability in the medium term. Conceptually, the marginal cost of a return associated with an additional sale should not exceed the marginal contribution generated by that additional sale.

In order to determine the most appropriate return management policy, customer profiling represents a crucial aspect. This involves recording information on customers' purchasing and return behaviour. The ability to develop a reliable database enables companies to design marketing and return policies tailored to specific customer clusters.

Röllecke et al. (2017), based on a study conducted on a large European online retailer, report that 5% of customers return more than 80% of their initial purchases, with one in five of these serial returners returning up to 90% of items. This clearly highlights the need for return policies oriented towards customer segmentation.

Customer value represents another key element to consider when defining a return policy. Kumar et al. (2016) describe customer value as a dual concept. First, it represents *perceived customer value*, namely the utility of an offering based on the customer's perception of what is received versus what is given (the traditional marketing perspective). Second, it refers to the value that customers provide to the firm, namely *Customer Lifetime Value* (CLV), understood in its broadest sense.

With regard to perceived customer value, the underlying economic principle is individual utility, whereby customers choose actions that maximise the difference between desired and undesired outcomes, which must, of course, be positive. These outcomes are generated by product attributes, which, in addition to price, include quality, brand, switching costs, learning costs, maintenance costs, risks, and undoubtedly return conditions. For the measurement of perceived value, Kumar et al. (2016) distinguish between compositional and decompositional approaches and provide an extensive review of the relevant literature.

As for CLV, its purpose is to assess the value that customers generate for the firm. It is a metric that accounts for customer heterogeneity and allows companies to treat individual customers differently

based on their contribution to the firm. This is achieved through the use of big data containing historical information that enables firms to predict future customer behaviour and calculate customer value accordingly. Kumar et al. (2016) define customer value as the economic value of the customer–firm relationship expressed in terms of contribution margin or net profit. In other words, CLV represents a disaggregated measure of customer profitability. When firms identify the value generated by their customers, they are better positioned to manage their policies effectively.

CLV approaches can be classified into two main categories: aggregated and individual approaches. In the aggregated approach, the average customer lifetime value is derived from the lifetime value of a cohort, a segment, or even the entire firm. This level of measurement helps companies assess the overall effectiveness of marketing and related policies, but does not support the personalisation of customer strategies. In the individual approach, a customer's CLV is calculated over the entire duration of their relationship with the firm, enabling companies to tailor strategies to customer needs and future profitability potential.

When calculating CLV, Kumar et al. (2009), Petersen et al. (2009) and Mollenkopf et al. (2009) also incorporate the expected return rate. For example, Zalando bases its returns management policy primarily on CLV and the company's cost structure (Röllecke et al., 2017).

Below is the predictive CLV formula for an individual customer as proposed by Gupta et al. (2006):

$$CLV = \sum_{t=0}^{T} \frac{(p_t - c_t) r_t}{(1+i)^t} - AC$$

Where:

- p_t = customer expenditure at time t;
- c_t = direct cost of customer service at time t;
- i = discount rate or cost of capital for the firm;
- r_t = probability that the customer will repurchase or remain "alive" at time t;
- AC = customer acquisition cost;
- T = time horizon for estimating CLV.

In order to account for returns, customer return rates and the average cost of handling a return must also be considered:

$$CLV = \sum_{t=0}^{r} \frac{(p_t * (1 - re_t) - c_t - cre_t * re_t) r_t}{(1+i)^t} - AC$$

Where:

- re_t = return rate at time t
- cre_t = return management cost at time t

In any case, the calculation can be simplified by relying on historical data (https://www.qualtrics.com/en-gb/articles/customer-experience/how-to-calculate-customer-lifetime-value/). In particular, in order to calculate Customer Lifetime Value (CLV) at company level in a simple way, the following variables can be defined:

- **Average purchase value**: the value to the company of all customer purchases over a given period of time (one year is usually the simplest), divided by the number of purchases made during that period.
- **Average purchase frequency**: the number of purchases over the same period divided by the number of individual customers who made at least one transaction during that period.
- **Customer value**: the average purchase frequency multiplied by the average purchase value.
- **Average customer lifetime**: the average period of time during which a customer continues to purchase from the company.

Thus, for the company:

CLV = (customer value × average customer lifetime)

If returns are to be taken into account, it is sufficient to modify the calculation of the average purchase value:

- **Average purchase value**: the value to the company of all customer purchases multiplied by (1 − return value rate), minus the total return management costs over a given period of time (one year is usually the simplest), divided by the number of purchases made during that period.

The *return value rate* is defined as the ratio between the total value of returned items and the total value to the company of all purchases.

The same calculation can be performed for different customer clusters or even for individual customers, in order to tailor return policies to specific clusters or individual customers. CLV can therefore be used as an indicator to monitor return policies in relation to overall company CLV, to

decide whether to block customer accounts based on individual CLV, or to assess return policies for specific customer segments.

Another key indicator used by some companies to evaluate their policies is the **Net Promoter Score (NPS)**. Röllecke et al. (2017) report that Amazon, Zalando and Zappos also use the Net Promoter Score to assess their return management programmes and options, and to personalise their portfolio of options.

The Net Promoter Score (NPS) is an indicator used to measure customer loyalty and their propensity to engage in word-of-mouth promotion of a company, product or service. Introduced by Fred Reichheld (2003), it measures the likelihood that customers will recommend a company, product or service to friends or colleagues.

Customers are asked the following question:
"How likely are you to recommend this company/product/service to a friend or colleague?"
Responses are given on a scale from 0 to 10.

Respondents are classified into three groups:

- **Detractors**: score 0–6. Dissatisfied customers.
- **Passives**: score 7–8. Satisfied but indifferent customers, at risk of being attracted by competitors.
- **Promoters**: score 9–10. Loyal customers who actively recommend the company.

The NPS is calculated using the following formula:

NPS = Percentage of Promoters (%) − Percentage of Detractors (%)

One way in which NPS can be applied to the evaluation of returns management is as follows:

- send the NPS survey to customers immediately after the return process has been completed;
- calculate the NPS;
- integrate NPS with other operational and service KPIs, such as return lead times, number of process steps, refund/replacement success rate, complaint rate, repurchase rate, etc., in order to understand not only how dissatisfied customers are, but also why, and to address the underlying causes;
- analyse NPS trends over time in relation to changes in return policies;

- directly contact detractors or customers who gave low scores to understand the specific reasons for dissatisfaction and use this information to improve the return process.

Bain & Company suggest the following NPS evaluation benchmarks:

- above 0: good
- above 20: favourable
- above 50: excellent
- above 80: world-class

Any score above 0 is considered "good", as there are more Promoters than Detractors. However, this should be regarded as the minimum acceptable level of performance.

4.4 – Problems arising from returns and their effects on corporate objectives

In order to define strategies for managing returns, it is first necessary to identify the problems—referred to by some authors as *barriers*—that arise in the management of returns and to determine how these problems affect the corporate objectives identified in Section 4.1:

- **reduction of costs in returns management**;
- **maximisation of customer satisfaction**, which corresponds to an increase in the number of customers as churn decreases, with a consequent increase in sales.

Jacobus D. Nel et al. (2020) highlight several problems related to returns management:

- **Product information**
  - customers do not have physical contact with the products;
  - the product does not correspond to the description on the website or in the catalogue;
  - information is outdated;
  - poor information integration with the customer;
- **Supply chain process issues**
  - customers receive defective products;
  - customers receive damaged products;
  - the wrong product is shipped to the customer;
- **Non-fraudulent customer behaviour**
  - the customer regrets purchasing the product
  - customers make mistakes when placing online orders;

    - customers purchase too many products;
    - customers purchase impulsively and change their mind after buying the product;
    - very high return rates during holiday periods;
- **Fraudulent or unethical purchasing behaviour**
    - wardrobing (see previous paragraph);
    - bracketing (see previous paragraph);
    - purchases made with stolen credit cards;
    - purchasing a product in order to replace it with a damaged or old one;
    - the customer claims never to have received the ordered goods;
- **Logistical aspects**
    - high reverse logistics costs affecting profitability;
    - the unpredictable nature of online returns;
    - long cycle times;
    - The products are delivered late to the customer.
- **External influences**
    - competitors' actions involving more permissive return policies; almost four out of five consumers consider free return shipping an important factor when choosing an online retailer (Solanki, 2018);
- **Managerial aspects** (Pornwasin Sirisawat, 2018)
    - top management in many companies does not devote sufficient effort to returns management;
    - there is a lack of an adequate organisational structure for handling returns;
    - there is a lack of coordination with third-party logistics providers (3PLs) and insufficient integration among departments involved in returns management.

We now move on to evaluate the effects of these problems on corporate objectives:

- **product information**: this directly affects the customer, who remains dissatisfied and may stop purchasing from the website, resulting in customer loss; moreover, the customer may return the product, thereby triggering the associated return costs;
- **supply chain process issues**: these affect the customer, who remains dissatisfied with a likely loss of the customer, and they certainly force the company to initiate a returns management cycle, increasing returns management costs;
- **customer non-fraudulent behaviour**: this has an impact on returns management costs;

- **fraudulent or unethical purchasing behaviour**: this has an impact on returns management costs;
- **logistical aspects**: these affect returns management costs;
- **external influences**: a competitor's permissive policies affect both customers—who may prefer to switch retailer—and returns management costs, as the company is pushed to adopt more permissive policies, thereby increasing returns and the related costs;
- **managerial aspects**: these aspects have a broad influence on both returns management costs and customer satisfaction.

Figure 10 shows the logical relationships between objectives and problems, and between problems and strategic actions (through subcategories that are not explicitly shown in Figure 10 for ease of representation, without however compromising the generality of the representation).

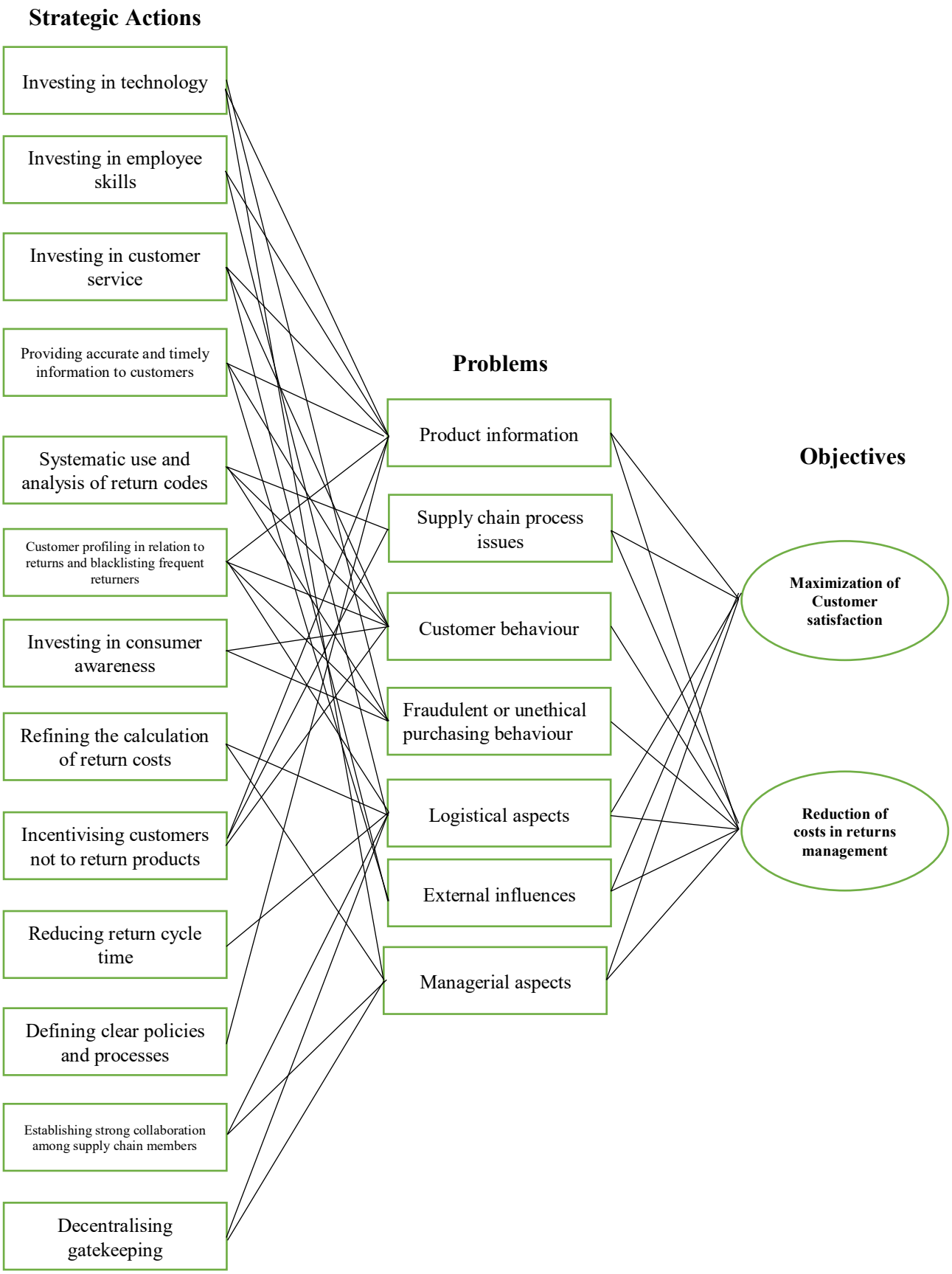

Fig.10 Links between Actions, problems and Objectives

4.5 – Strategic actions for returns management

For effective returns management, appropriate checks must in any case be carried out upon receipt of returned products; otherwise, implementing further strategic actions to improve returns management would be meaningless. In particular, it is necessary to record delivery lead times, the quality of the goods in the case of defective products and the possible influence of packaging, as well as discrepancies between the order placed and the product received. On the basis of these elements, the return should then be properly classified.

In addition, strategic actions can be implemented that concern the overall returns management process. Some of these actions, identified by Frei et al. (2020), Jacobus et al. (2020) and Muhammad Hamza Naseem (2021), are outlined below. These actions address the problems (or barriers) that in turn affect corporate objectives related to returns management. It is therefore possible to establish a relationship between strategic actions aimed at preventing returns and corporate objectives. Clearly, the positive effects of the actions described are not limited to returns management alone, but also extend to other managerial areas; for example, customer profiling has a significant impact on marketing activities, enabling the creation of offers targeted at specific customer clusters.

Based on the literature reviewed and as illustrated in Figure 6, the following strategic actions are considered particularly relevant:

- **Investing in technology**:
  Investment in technology can also support the identification of fraudulent behaviour by enabling clearer customer identification. For example, adding RFID tags to each product can improve product traceability; only products returned with a receipt and an RFID tag would be accepted, ensuring that returned items correspond to the original purchase. RFID tags can also be used to track the movement of goods during delivery and to notify customers immediately of any delays. Another example is the use of software to generate shipping labels and allow customers to track the status of returns, which speeds up processing, reduces errors and improves the customer experience.
- **Investing in employee skills**:
  Well-trained employees possess the appropriate skills to significantly reduce cycle times and improve the recovery of returned products, thereby lowering return-related costs.
- **Investing in customer service**:
  Real-time customer interaction through chat or other channels, the use of artificial intelligence, and the analysis of reviews to understand the causes of customer dissatisfaction

all contribute to ensuring that customers receive the right product in the right way. Improved coordination with customers can also help address quality issues and provide installation support. A significant proportion of returns occur because customers are unable to install a product correctly or do not know how to use it. To prevent this, companies should provide clear information on product usage, ideally through live chat with an operator or AI-based support, thereby reducing the likelihood of returns.

- **Providing accurate and timely information to customers**:
  This includes analysing product descriptions to supplement missing information, providing detailed visual representations of actual products (including three-dimensional views), offering guidance on product usage, size guides and fit information, using AI-based customer interfaces, providing detailed photographs and attaching manuals. These actions help both to reduce churn and to attract new customers. With regard to return rules, when customers know exactly how and when they can return an item, uncertainty and anxiety are reduced, allowing them to purchase with greater confidence. Timely updates on return status reassure customers and reduce stress by minimising the need to seek information, thereby improving their sense of control over the relationship with the retailer.
- **Systematic use and analysis of return codes, reviews and feedback**:
  This enables the identification of products most frequently returned and allows statistical analysis of return reasons by product category and business area, enabling management to address underlying issues. Analysing both return reasons and customer reviews helps determine whether missing or unclear information is a source of dissatisfaction. Using return data to improve inventory decisions, product descriptions, size guides or quality issues helps prevent future customer disappointment. This not only reduces returns but also enhances the overall customer experience. For example, if a particular clothing item is returned in 40% of cases due to the reason “size too small”, the retailer can update size charts and product descriptions regarding fit. Similarly, if a bag brand finds that “colour different from the photo” is a frequent reason for return, it should provide more accurate or higher-quality images.
  However, Frei et al. (2020) note that company statistics on returns are often incomplete, fragmented, managed by different departments, inconsistently monitored and not adequately communicated to top management.
- **Customer profiling in relation to returns and blacklisting frequent returners**:
  Identifying and blacklisting customers who frequently return products can reduce fraud, as sales to customers with return rates above a certain threshold can be blocked or their return

reasons more closely scrutinised. An example is Amazon's closure of German and British customer accounts due to excessive returns (www.theguardian.com).

- **Investing in consumer awareness**:
  Consumers are currently often unaware of the environmental and economic impact of their choices. Systematic analysis of return codes, combined with behavioural studies, can provide deeper insights into why certain consumer groups return products frequently.
- **Refining the calculation of return costs**:
  More accurate quantification of return costs, including environmental costs, is essential in order to intervene more effectively on the factors influencing return-related expenses.
- **Incentivising customers not to return products**:
  Examples include offering shopping vouchers if customers waive the return, resending the same item if requested, exchanging it for a higher-value product, or rewarding customers who choose store credit instead of a refund, thereby mitigating the impact of returns on liquidity.
- **Reducing return cycle time**:
  This can be achieved through the use of third-party logistics providers (3PLs) or by improving the overall returns process (routing, gatekeeping, destination decisions, storage and credit management). Reducing return cycle time affects return management costs, customer satisfaction and the recovery value of returned items. A fast and simple process minimises inconvenience for customers and creates a positive impression of the business, even when the product was not suitable. Immediate refunds increase customer satisfaction and encourage repeat purchases through the same channel. Moreover, many products lose value over time; therefore, shortening the return cycle reduces value loss before reintegration into the commercial cycle, particularly for seasonal products.
- **Defining clear policies and processes**:
  Clear policies help customers better understand return procedures and rules, while well-defined processes prevent additional costs and unnecessary prolongation of the return cycle.
- **Establishing strong collaboration among supply chain members**:
  This action addresses issues related to supply chain processes.
- **Decentralising gatekeeping**:
  A decentralised and specialised structure for handling returns can reduce returns management costs. In some cases, when companies do not achieve sufficient economies of scale, they may rely on third-party logistics providers (3PLs).

4.6 Some detailed proposals for a return policy

Since a permissive return policy, while increasing the number of customers, simultaneously increases returns, Narayan Janakiraman et al. (2016) suggest a selective return policy that they believe can increase purchases while at the same time reducing returns:

- **Selective policy based on the reason for return:** GAP has a 45-day return policy for any exchange, but offers an unlimited return policy for defective products;
- **Selective policy based on time:** Neiman Marcus offers a 100% refund for returns made within 60 days, and a 75% refund for returns made between 60 and 120 days;
- **Selective policy more lenient for lower-priced and non-branded products that require marketing support:** more lenient return policies not only reduce customers' perceived risk, but also act as signals of quality;
- **Selective policy more lenient for selected customers.**

Pedro Amorim et al. (2023) analyzed the behavior of online customers of a fashion marketplace across hundreds of thousands of purchase cases. From their observations, analyzing customer return rates, they concluded that the company would derive significant benefits if items were delivered in consolidated shipments rather than split shipments, even if some items arrived later. In fact, they observed that in the case of consolidated deliveries, the return rate for shipments decreases, while also reducing reverse logistics costs. However, given that company policy generally tends to accelerate product delivery as much as possible, customers could be given the option to decide whether to consolidate their orders, allowing them to choose whether they want their items delivered together, even if this may result in longer delivery times. Such a policy would increase the contribution margin of each product due to the lower probability of return, as well as reduce logistics costs as a result of consolidation.

Other specific actions adopted by companies include:

- **Conditional returns:** only products in their original packaging, unused, and with tags attached are accepted;
- **Return shipping costs:** free returns are offered only for defective or damaged products; for other reasons, the customer must pay for return shipping;
- **Weight monitoring and control:** reduces empty-box fraud;
- **Restocking fees for expensive products:** discourages returns of products whose restocking is costly for the company.

4.7 – Current return policies among leading companies

After conducting research based on the scientific literature on return management policies over the past 20 years, it seemed appropriate to assess the current return policies adopted by some major European retailers, in order to better understand sector trends.

First, it is important to recall the European regulatory framework. Under the general rules for online purchases in the EU (implemented in Italy through Legislative Decree No. 206/2005, the "Consumer Code"), a consumer has the right to withdraw from a distance contract within 14 days of receiving the goods, without having to provide any reason.

Zalando

- In addition to the statutory right, Zalando offered a more generous "voluntary return right": until 2024/2025, customers were allowed to return items within 100 days. (https://www.telefoniatech.it/163336-zalando-modifica-la-politica-di-reso-dal-7-gennaio-2025-il-limite-passa-a-30-giorni/
- Starting from 7 January 2025, in several markets (including Italy, Germany, and the Netherlands), the voluntary return window was shortened to 30 days. (https://ecommercenews.eu/zalando-adjusts-return-policy-and-plus-program/)
- Returns remain free of charge (or otherwise managed according to the stated conditions), using a return label provided by the seller. (https://www.zalando.it/zalando-terms)

ASOS

- ASOS allows customers in Europe to return an order within 28 days of receipt to obtain a refund. (https://www.asos.com/customer-care/returns-refunds/how-do-i-return-something-to-you-from-europe)
- Returns must comply with the "original condition" requirement: for example, certain items (underwear, swimwear, hygiene products, etc.) cannot be returned once opened or if the seal has been broken. (https://www.asos.com/customer-care/returns-refunds/what-is-your-returns-policy)
- Exchanges are not offered; ASOS issues a refund if the return is accepted. (https://www.asos.com/customer-care/returns-refunds/how-do-i-return-something-to-you-from-europe)

Amazon (European marketplace)

- From 23 June 2025, Amazon modified its return policy for several product categories in Europe, reducing the return period from 30 days to 14 days, in line with the right of withdrawal provided by EU legislation. This applies in particular to the following categories, regardless of the fulfillment method: books, software, games and toys, DIY, video, home and kitchen, automotive, health and personal care devices, home cinema, TV and video, large household appliances, home, business, industry and science. (https://sellercentral.amazon.it/seller-forums/discussions/t/0bcd3d39-a2b8-4a6f-9675-1bdb39b20ae2)
- In addition to the statutory 14-day right of withdrawal, Amazon's return policies allow users to change their mind and return purchased items for any reason within an extended period of 30 calendar days from the delivery date for certain product categories. This option applies to: Fashion and fitness, Food and beverages, Beauty and health, Pet products, Garden and gardening, Furniture, and Amazon Devices. (https://www.amazon.it/gp/help/customer/display.html?nodeId=GKM69DUUYKQWKWX7)
- During promotional or seasonal periods (e.g. holidays), Amazon may temporarily extend the return window for many categories. (https://www.amazon.it/gp/help/customer/display.html?nodeId=GKM69DUUYKQWKWX7)
- Returns may involve costs charged to the customer, depending on the type of product and the chosen return method; returns are not always free of charge. (https://www.amazon.it/gp/help/customer/display.html?nodeId=GJQG34CHB5RBDHZ9)

IKEA

- Very generous return policy: in many countries, products can be returned within 365 days for a refund if they are in new/unused condition. The return of opened products, including assembled items, within 365 days, provided they are intact and clean, is accepted in some markets. (https://www.ikea.com/it/it/customer-service/returns-claims/return-policy/).

H&M

- The return deadline at H&M is 30 days from receipt of the order. Items must be in good condition and with tags attached. Returns are free both in-store and via courier/collection points. Refunds are usually processed within 14 days from shipment of the return.

- Policies vary by country: in some online markets, free returns are no longer guaranteed, and in some countries a postal return fee is applied. In Belgium, for example, online returns cost approximately €1.95, except for "Plus" members or in-store returns. (https://www.retaildetail.eu/news/fashion/hm-ends-free-returns/)
- In Italy, for H&M items:
    - In-store (at the checkout or via H&M lockers): free of charge.
    - At a collection point or locker: free for H&M members, €2.99 for non-members.
    - Home pickup: €4.95.

      For items from other brands:
    - At a collection point or locker: free for H&M members, €2.99 for non-members.
    - Home pickup: €4.95.

https://www2.hm.com/it_it/service-clients/resi.htm

SaldiPrivati

- If a product is returned because it is defective or not compliant with the purchase, SaldiPrivati covers the shipping costs by sending a prepaid label within 72 hours of registering the return to the email address associated with the account.
- In the case of exercising the right of withdrawal: if a prepaid label is chosen, €6.99 will be deducted from the refunded order amount. If the customer chooses to ship the return with a courier of their choice, return shipping costs are paid directly to the selected courier. If a bulky item is returned, customer service will arrange collection via a specialized courier; in this case, return costs range between €60 and €120.

Veepee

- Grants 14 calendar days to request a return, starting from the delivery date.
- Does not offer size, item, or quantity exchanges.
- The cost of the return service for voluntary returns is €7; it is free if the received item is incorrect or defective.
- Products from different brands or campaigns must be returned separately.
- Returns are accepted for all items except:
    - fresh or perishable food products;
    - personal-use or hygiene items that have been opened;
    - vouchers or services.

As already mentioned, return policies also concern logistical aspects, in particular the need for specialized return-management sites. Centralizing operations makes it possible to reduce transportation, cut emissions, and speed up procedures. A return processed through a single center is easier to track, inspect, and reintegrate into the supply chain. (https://www.corriere.it/tecnologia/cards/cosa-succede-quanto-rimandi-indietro-qualcosa-comprato-online-siamo-entrati-dentro-il-magazzino-dei-resi-amazon/cose-mxp5_principale.shtml?refresh_ce), (https://typomedia.co/green/dove-finiscono-resi-amazon-nostro-tour-centro-mxp5-piacenza), (https://www.ilpiacenza.it/economia/amazon-castelsangiovanni-come-funziona-centro-resi-prodotti-restituiti-rimborsi-logistica-lavoro.html), (https://www.hwupgrade.it/news/web/amazon-il-destino-di-un-reso-il-viaggio-all-interno-del-centro-mxp5-di-castel-san-giovanni-147477.html).

In this regard, for medium-sized and small-to-medium products throughout Italy, Amazon's centralization of return management should be noted. In December 2025, the first logistics center opened by Amazon in Italy in 2011—MXP5 in Castel San Giovanni—was transformed and specialized in return management, creating an innovative logistics model. This facility is in fact the first center in the country fully specialized in return management, equipped with the most advanced technologies in the sector, employing approximately 1,300 workers across a surface area of 260,000 square meters over three floors. MXP5 nevertheless maintains a limited share of fulfillment activities, i.e. shipping new products, reserved for the "hazmat" category, which includes potentially dangerous goods such as aerosols or flammable materials.

Returned products are immediately scanned to identify the issue and are then routed to a specific specialized line depending on the product type and the nature of the problem. For example, a backpack may be sent to a line where stains or damage are checked; if the product is like new, it is repackaged and returned to the market as "new." Electronic products, on the other hand, are sent to a line where they undergo specific inspections. In the case of mobile phones, for example, the system prompts the operator to inspect certain product features and then suggests the appropriate destination for the item, although the final decision remains with the operator.

After the evaluation operations, a robotic arm rapidly sorts the returns. A first channel includes products that can be sold again as new. A second channel includes products showing signs of use but fully functional, which are directed to Amazon's second-hand marketplace. A third channel is Amazon Renewed, which includes devices that can be refurbished and restored to like-new condition. Items that are no longer saleable are allocated to third parties for recovery activities.

When potentially fraudulent behavior emerges (anomalous returns or purchases aimed at harming Amazon or third-party sellers), specific verification mechanisms are activated. One issue within the facility is the overly monotonous nature of the work routine; therefore, employees generally rotate across three processes in order to make their work less alienating.

4.8 – Assessment of current trends in the sector

It can be observed that in all EU countries, distance-selling regulations provide for a "right of withdrawal" of at least 14 days from receipt of the goods, without the need to give any reason. This rule is naturally complied with by all retailers.

With regard to returns that go beyond the 14-day limit, there is a general trend—starting around 2024—towards a revision of previously generous conditions. Some major retailers that once offered very flexible return windows (e.g. 100 days) are now reducing them, likely in order to contain return-related costs, as in the case of Zalando. Differences can also be observed by product category. For example, fashion and apparel tend to offer more generous and free returns, because a strict return policy for this category would expose customers to excessive perceived risk, potentially leading them to prefer physical stores. For electronics, furniture, bulky or high-priced items, policies are often more restrictive (14 days), or, if longer, involve return costs. Conversely, some retailers (e.g. IKEA) offer a very long return window (up to 365 days), which can be a strong differentiating factor and a source of reassurance for customers purchasing furniture or home goods online; clearly, such a window would not make sense for other types of products.

Based on the information presented above, it appears that major companies are shifting from a type-3 return policy to a type-2 return policy, seeking to balance customer satisfaction with return costs.

Another factor that should not be overlooked is the environmental impact of returns, which is becoming increasingly important. In a recent article, Roichman et al. (2024), based on an analysis of approximately 630,000 clothing items returned in Europe, show that for many returns the product is not resold: between 22% and 44% do not reach a second consumer. The authors also quantify that the greenhouse gas emissions associated with the production and distribution of non-reused returned items can be 2 to 16 times higher than all post-return emissions arising from transportation, packaging, and reprocessing. Environmental impact is therefore another factor that may lead retailers to adopt more restrictive return policies.

Another emerging trend is the centralization of the logistics process, aimed at making it more specialized, reducing transportation, cutting emissions, speeding up procedures, and enabling better

planning and control of returns. A further benefit of centralization is the improvement of after-sales service, especially when a return results in a refund: not all items can be refunded immediately, and centralized evaluation speeds up inspections, reducing case resolution times. This solution was likely necessary for Amazon at the point when a significant increase in returns required greater control.

Chapter 5 – Optimization of the return management strategy

5.1 Applications of MCDM models to Return Management

MCDM techniques have been applied by several authors to Return Management. Himanshu Prajapati et al. (2019) report a review of articles published on MCDM applications in reverse logistics. In particular, with regard to the Analytic Hierarchy Process (AHP) / Fuzzy Analytic Hierarchy Process (FAHP), which is the most widely used method, the author identified 44 articles; for the Techniques for Order Preference by Similarity to Ideal Solution (TOPSIS) / Fuzzy TOPSIS (FTOPSIS) methods, 16 articles; for the Analytic Network Process (ANP), 8 articles; for the Delphi / Fuzzy Delphi method, 6 articles; for Interpretive Structural Modeling (ISM), 5 articles; and for Matriced' Impacts Croisés Multiplication Appliquée à un Classement (MICMAC), 4 articles. Below is a summary of some applications that are more closely related to strategic and operational decision-making.

Dimas Haki Prayogo et al. (2024) apply the AHP technique under conditions of certainty to answer two questions:

- What are the key factors influencing customer experience at the time of return in Indonesia, and what is their relative importance?
- What are the most appropriate solutions to improve customer experience and reduce the volume of product returns in reverse logistics in Indonesian e-commerce, and what is their relative importance?

The factors identified by the authors are:

- shipping and handling (assessing the condition of goods upon arrival);
- timeliness (product delivery times);
- accuracy of product description (differences between the product description and the product received);
- return procedures and guidelines;
- product quality (examining product quality when the returned item is defective or malfunctioning);
- order fulfillment accuracy (identifying discrepancies in order fulfillment).

Among these, the most important factors were identified as product quality, with a weight of 0.420 out of 1, and order fulfillment level, with a weight of 0.193 out of 1.

The alternatives proposed by the authors are:

- IT implementation;
- clear return policy;
- collaboration with logistics partners;
- managerial awareness;
- standardized reverse logistics process;

- creation of a goods catalog.

Among these, the most important alternatives were identified as a clear return policy, with a weight of 0.259, and a standardized reverse logistics process, with a weight of 0.254.

Vineet Kaushik et al. (2022) evaluated various factors responsible for returns of clothing purchased online in the Indian context. A total of 34 factors were identified through a literature review and consultation with experts in the fashion industry. The results of the study show that the crucial factors for online apparel returns are:

- fit and size variation;
- defects;
- search for a better product (purchase wisdom);
- incorrect product delivery;
- lenient return policy;
- value for money.

The authors use the Best–Worst Method (BWM) to rank and prioritize the evaluation criteria for online apparel returns.

Aditya Kumar Sahu et al. (2025) examined 19 causes underlying opportunistic returns. The results suggest that a permissive return policy, product discounts, weak or nonexistent consequences for such behavior, prior experiences with fraudulent returns, and post-purchase price reductions are the five main causes of opportunistic returns on e-commerce platforms. To rank the causes, the authors use the Ordinal Priority Approach (OPA) developed by Ataei et al. (2020) and neutrosophic numbers, which account for uncertainty, to calculate the weights of the causes based on their attributes.

Jung-Tang Hsueh et al. (2015) present processes for evaluating the optimal collection strategy in reverse logistics (RL) for the downstream segment of Taiwan's photovoltaic industry (TPI). They combine the Analytic Hierarchy Process (AHP) with the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). Initially, criteria and sub-criteria were established to evaluate the related Benefits, Opportunities, Costs, and Risks (BOCR). AHP was then used to obtain the weights of the criteria and sub-criteria, and TOPSIS was used to rank the optimal collection strategy in terms of overall evaluation criteria. The results of the study are intended to provide downstream TPI decision-makers with academic support and valuable guidance for evaluating their collection programs and obtaining optimal strategies for managing RL practices.

Chandra Prakash et al. (2015) identify what they call barriers to the implementation of RL, namely: managerial barriers, organizational barriers, economic barriers, legal barriers, technological barriers,

infrastructural barriers, and market barriers. Each barrier is further divided into sub-barriers, and the Fuzzy AHP (FAHP) technique is applied to obtain the weights of the barriers and sub-barriers. Subsequently, solutions to overcome these barriers are proposed, including: awareness and support from top management, balancing cost efficiency with customer responsiveness, simplifying and standardizing processes, measuring costs and performance, cross-functional collaboration, strategic collaboration with reverse chain partners, aligned policies and processes, harmonized and standardized return policies, perceiving returns as perishable goods, integrating reverse logistics into sustainability programs, recovering value from returns, and controlling delivery times. The solutions are evaluated against the sub-barriers using linguistic variables, and, considering the weights of the individual sub-barriers, the Fuzzy TOPSIS (FTOPSIS) methodology is applied to rank the solutions. An empirical case from the Indian electronics industry is presented to illustrate the use of the proposed method.

Chia-Nan Wang et al. (2021) conducted a study aimed at developing a decision support system to assist companies in the selection and evaluation of different third-party reverse logistics providers (3PRLPs) using a hybrid fuzzy multicriteria decision-making (MCDM) approach. The evaluation criteria include economic, environmental, social, and risk factors, and pairwise comparisons among criteria are performed using linguistic terms. Alternatives are evaluated against the criteria and then ranked using the FTOPSIS technique, taking into account the criterion weights calculated through FAHP.

Pornwasin Sirisawat et al. (2018) observe that reverse logistics (RL) practices are among the most important strategies to ensure efficient resource utilization and minimize waste from end-of-life products while complying with legislation and sustainability principles. To achieve this objective, companies must understand and consider both the priority of barriers to minimizing waste and the priority of solutions for developing policies and strategies to overcome those barriers. The barriers considered by the authors include managerial barriers, organizational barriers, product barriers, legal barriers, technological barriers, infrastructural barriers, financial barriers, and involvement and support barriers. These barriers are further divided into sub-barriers, which constitute the sub-criteria. Fuzzy AHP is applied to obtain the weights of each barrier and sub-barrier through pairwise comparisons, and fuzzy TOPSIS is subsequently applied for the final ranking of reverse logistics implementation solutions. The proposed model is applied to the case of the Thai electronics industry. The article appears very similar to that of Chandra Prakash et al. (2015) cited above.

Muhammad Hamza Naseem et al. (2021) propose a study aimed at identifying and prioritizing logistics solutions relative to reverse logistics barriers in the e-commerce sector in Pakistan. Focusing on Pakistan, they identify and rank obstacles and corresponding solutions so that management can address reverse logistics issues while considering the priority of both barriers and solutions. They apply a three-phase decision-making model. In the first phase, the current state of the e-commerce sector is defined, barriers to reverse logistics are identified, and corresponding solutions for successful RL implementation are proposed. Through a literature review and expert opinions, they identify five categories of barriers to effective reverse logistics implementation, divided into 14 subcategories: management-related barriers (lack of top management commitment, weak organizational culture, focus only on forward logistics), infrastructural barriers (lack of storage and transportation infrastructure, lack of technological infrastructure), coordination barriers (lack of coordination with 3PLPs, lack of coordination with customers, poor service quality), policy barriers (poor return policies, limited governmental attention to reverse logistics), and financial and economic barriers (high RL costs, lack of liquidity to manage returns, expenses for collecting used products, lack of forecasting and planning in RL). The authors also identify eight solutions to these obstacles: top management support and awareness, defining clear policies and processes, developing infrastructure and facilities to support RL, establishing IT-enabled collaboration among supply chain members, developing strong relationships with third-party logistics service providers, providing visual product details, standardizing the RL process, and improving quality issues through customer coordination. In the second phase, the fuzzy AHP method is used to determine the weights and priorities of barriers and sub-barriers. Subsequently, the fuzzy TOPSIS method is used to prioritize and rank reverse logistics solutions.

Abbas Mirakhorli uses a fuzzy interactive goal programming method to solve the design of an integrated forward/reverse logistics network including production, distribution, and collection/inspection facilities. The author simultaneously considers two fuzzy objectives: minimization of total cost and minimization of total delivery time (used as a measure of customer satisfaction in relation to the logistics network). The decision problem concerns the optimal location of plants, distribution centers, and collection/inspection centers, as well as the optimal quantity of products shipped from plants to customers through distribution centers and the optimal quantity of returned products shipped back from customers to plants through collection/inspection centers, taking capacity constraints into account. Thus, the author assumes total cost and customer satisfaction—albeit measured simply through total delivery time—as strategic objectives, albeit limited to logistics network design.

Deepak Lamba et al. (2019) use a methodology based on the Analytic Hierarchy Process to prioritize RL barriers. Based on literature analysis and expert consultation, the authors identify 16 barriers in the Indian context: managerial barriers (lack of top management commitment, lack of training and education on returns, lack of a performance measurement system, greater concern for forward logistics), coordination barriers (lack of understanding of best practices, lack of support from logistics partners, customers not informed about take-back, poor quality of return services), policy barriers (poor return policies, lack of supportive government policies, loopholes in Indian e-commerce regulations), infrastructural barriers (lack of storage and transportation infrastructure, lack of technological infrastructure to adopt RL), and economic barriers (lack of investment, lack of economies of scale, uncertain demand and insufficient forecasting). The weights of the barriers and their subcategories are obtained using a fuzzy AHP (FAHP) approach. The analysis shows that economic barriers account for 29.4%, coordination barriers 25.5%, managerial barriers 17.8%, infrastructural barriers 15.1%, and policy barriers 11.9%.

Tran Thi Huong et al. use the Analytic Hierarchy Process (AHP) and the Relative Importance Index (RII) to analyze and prioritize barriers grouped into five main categories: government, organizational and management methods, supply chain coordination, finance and economics, and infrastructure, each further divided into subcategories.

5.2 Evaluation of strategic actions and alternatives

5.2.1 Multicriteria decision-making

Business management consists of a sequence of decisions. In many cases, management is faced with several alternatives from which a choice must be made; these alternatives may be independent, mutually exclusive, or conditional.

There are many issues related to the evaluation of alternatives, in particular:

- Each alternative is characterized by benefits and costs expressed in different units of measurement;
- The evaluation of indicators is uncertain;
- Some indicators are quantitative, others qualitative; some are objective, others subjective;
- Preferences (utility functions) are not necessarily linear with respect to changes in the indicators;
- The objectives to be achieved are generally more than one and may be in conflict with each other;

- When there is more than one evaluator, different judgments may be expressed;
- The existence of constraints that may be more or less rigid.

Reality is therefore very complex, and consequently it is necessary to use models that are capable of interpreting different situations, expressing corporate objectives, that are easy to understand, and that do not involve high costs in terms of time and money.

It should not be forgotten, however, that models do not make decisions; people do. Decision-makers also assume responsibility for the decisions they take. A model is only a partial representation of reality, intended to support decision-making by helping to orient and justify decisions.

A fundamental aspect of any model is its ability to assess how well the alternatives satisfy the company's objectives. As a consequence, if corporate objectives have not been defined, it is not possible to make a decision. This aspect, which should not be underestimated, led me to structure the decision-making problem by basing it on what I consider to be the fundamental objectives that top management should refer to when choosing a strategic alternative to improve return management within the company. Unlike other authors examined, who rank so-called barriers without relating their effects to the company's overall objectives, in the proposed model I relate the effects of strategic actions to the objectives identified in Section 4.6, Fig. 10, in particular:

- reduction of costs in return management;
- maximization of customer satisfaction, corresponding to an increase in the number of customers as churn decreases, resulting in higher sales.

Clearly, this is a proposed set of objectives that could be extended to take into account other general aspects, such as environmental considerations, which are becoming increasingly relevant today, but which would nevertheless require a specific in-depth analysis. Some authors have examined the environmental effects of return management by proposing decision models, such as routing combined with facility location, which affect both investment and operating costs as well as environmental performance.

I believe that structuring the decision-making model around the two aforementioned fundamental objectives can be useful for management because, depending on the company's current context, top management can decide whether to assign greater weight to costs or to customer satisfaction, implementing those strategic actions that have the greatest impact on the chosen combination of the two objectives.

Decision-making models can be:

- **Single-criterion**
  - The choice is made by maximizing or minimizing a single objective function or on the basis of a single criterion.
- **Multicriteria**
  - **Multi-objective**, in the case of multiple objective functions and a solution space that can be considered continuous and therefore infinite;
  - **Multi-attribute**, in the case of a very limited and discrete number of alternatives.

In the present case, the so-called multi-attribute decision-making (MADM) technique should be applied, corresponding to a finite and enumerable number of explicitly defined alternatives.

MADM techniques can be **compensatory** or **non-compensatory**. In the former case, a poor result with respect to one criterion can be compensated by good results on other criteria, as in weighted methods. In the latter case, a poor result on one criterion cannot be compensated by good results on other criteria, as in methods such as ELECTRE.

5.2.2 Problem structuring

Figure 10 represents a hierarchical structure through which it is possible to assess the importance of each element at a lower level with respect to an element at a higher level, moving from left to right. It is therefore possible to determine an importance ranking of strategic actions, problems, and objectives. To address ranking problems, multi-attribute MCDM (Multi-Criteria Decision Making) methodologies can be used, such as AHP, TOPSIS, ELECTRE, PROMETHEE, EVAMIX, VIKOR, DEMATEL, etc. (Alireza Alinezhad et al., 2019). Moreover, the approach may be deterministic or based on uncertainty in the evaluations.

Once a quantitative ranking of strategic actions has been obtained, overall strategies can be defined through the combination of individual strategic actions, taking into account the importance calculated for each action. These overall strategies can then be evaluated with respect to the problems and objectives in order to make a choice. To apply these methodologies, it is clearly necessary to rely on experts capable of providing quantitative or qualitative assessments. It is evident that the quality of the experts is essential to obtain good results; therefore, expert selection is always a critical phase in solving quantitative ranking problems.

In order to ensure procedural simplicity, it is proposed to apply the AHP technique to evaluate the problems against the objective (objective 1 or objective 2), and the subcategories against the problems, and then to use SAW (Simple Additive Weighting) to evaluate individual strategic actions

or combinations of strategic actions against subcategories. Accordingly, the structure to which the AHP technique is applied is that shown in Fig. 10, fig.14 e fig.15. Once the weights in the scheme of Fig. 10 have been determined, the impacts of each strategic action on the problem subcategories, the problems, and the objectives of customer satisfaction and cost minimization can be evaluated.

It may be of interest to identify the dominant strategic actions with respect to the two objectives of the problem, to which particular attention should be paid when defining an overall strategy.

For the evaluation of strategic actions with respect to problem subcategories, for the sake of simplicity a qualitative scale from 0 to 4 is proposed, where the numerical variables express linguistic variables as shown in Table 1

value	linguistic variable
0	No effect
1	Small effect
2	Medium effect
3	Large effect
4	Very large effect

Table 1. Numerical variables express linguistic variables

5.2.3 Weighted Method or Simple Additive Weighting (SAW)

Let:

– $\mathbf{S_i}$ = total score of the *i*-th alternative;

– $\mathbf{S_{ij}}$ = the evaluation of the *i*-th alternative with respect to the *j*-th problem subcategory;

– $\mathbf{w_j}$ = weight of the *j*-th problem subcategory.

$$S_i = \sum_{j=1}^{n} s_{ij} \cdot w_j$$

“In our case, the evaluation of the *i*-th action with respect to the *j*-th problem subcategory is carried out on a scale from 0 to 4. Therefore, since each action with respect to each subcategory is assessed on the same 0–4 scale, score normalization is not required.

Simple Additive Weighting is a compensatory method.

5.2.4 The AHP Method

The Analytic Hierarchy Process (AHP), developed by T. L. Saaty at the Wharton School of Business, makes it possible to identify the most satisfactory solution for decision-makers by representing a complex problem within a hierarchical structure, taking into account both tangible and intangible aspects.

The methodology allows the measurement and synthesis of the multitude of factors involved in complex decisions and also considers the experience and socio-technological background of decision-makers to be just as important as the data they are required to process (Luis G. Vargas, 1990).

The use of AHP enables decision-makers to derive their preference scales by taking into account:
• the available information;
• their experience;
• their ability to discern;
• their intuition.

Among the applications of the methodology are:
• the determination of action priorities among programmes, intervention strategies, and projects;
• resource allocation;
• personnel selection;
• the ideation and design phase of a product;
• the determination of the cost–benefit ratio of a project when it is not possible to evaluate the advantages and disadvantages arising from its implementation exclusively in monetary terms;
• the formulation of marketing strategies.

The name *Analytic Hierarchy Process* succinctly reflects the approach of the method:
• **Analytic**: breaking down the problem into its constituent elements;
• **Hierarchy**: structuring the decision problem in a hierarchical form to improve its comprehensibility;
• **Process**: processing data and judgements, helping the decision-maker to find the most satisfactory solution.

It is a compensatory decision-support methodology, as strategies that perform poorly with respect to one or more criteria can compensate for this through better performance with respect to other criteria.

The phases on which AHP is based are:

1. **HIERARCHICAL DECOMPOSITION**
   a. Identifying the constituent elements;
   b. Structuring the problem in hierarchical form.
2. **PAIRWISE COMPARISONS**
   a. Expressing judgements through pairwise comparisons in order to determine the local weights of the elements.

3. **SYNTHESIS OF RESULTS**
   a. Checking the consistency of the judgements;
   b. Calculating the scores of the alternatives.

Through decomposition, the constituent elements of the problem are identified and the problem is structured hierarchically, highlighting the logical relationships that exist among the elements (Fig. 11 and Fig. 12).

In defining this structure, it is necessary to ensure the dependence of each level on the one above it, as well as the independence of the elements within the same level.

The hierarchical structure may be complete when every element at a given level depends externally on each of the elements of the level above (Fig. 11). In this case, all the elements of a level must be comparable with one another in pairs, taking any of the elements of the upper level as a reference.

The hierarchy is incomplete when at least one element at a given level is independent of at least one of the elements of the level above (Fig. 12).

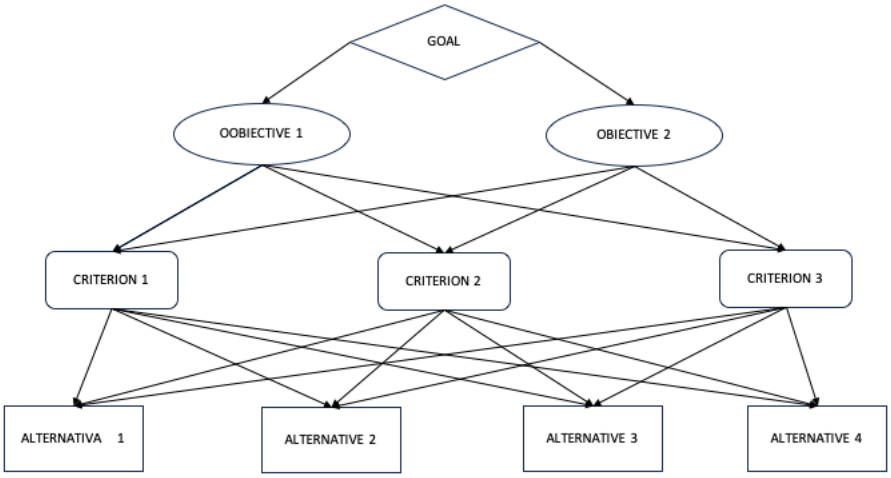

Fig.11 Complete hierarchical structure

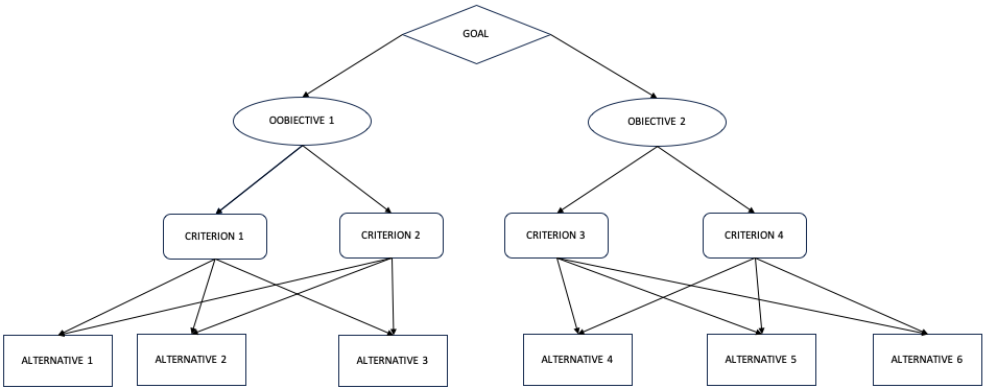

Fig.12 Incomplete hierarchical structure

Comparative judgments are expressed by comparing pairs of elements at the same level with respect to an element at a higher hierarchical level, measuring the priority assigned to one element relative to another. For each pair, the decision maker expresses these judgments verbally by using appropriate semantic, numerical, or graphical scales.

In the case of a complete hierarchy, for each level as many pairwise comparison matrices are defined as there are elements in the higher level. If we denote by $A_k$the generic pairwise comparison matrix with respect to an element $k$of the higher hierarchical level, the element a_{kij}represents the comparative judgment measuring the priority assigned to element $i$over element $j$with respect to the higher-level element k. From this matrix, using appropriate methods, it is possible to compute the weights of each element $i$with respect to the higher-level element k, which can be denoted as p_{ki}.

In the Analytic Hierarchy Process (AHP), three axioms must be satisfied:

The reciprocity axiom – For every $a_{kij} \in A_k$(where $A_k$is the pairwise comparison matrix), the relationship $a_{kij} = 1/a_{kji}$holds, with $a_{ii} = 1$. This means that if the evaluator estimates that element A is twice as important as element B, then element B is considered to have half the importance (0.5) of element A.

The homogeneity axiom – The elements being compared should not differ by more than one order of magnitude (i.e., they must be homogeneous). Moreover, the size of the levels should generally decrease when moving from the bottom to the top of the hierarchy.

The independence axiom – The weights of a given level must not depend on a lower level. The preference expressed among the alternatives depends on a higher level (criteria or subcriteria), but not vice versa.

For each pair of criteria (subcriteria or alternatives), the decision maker expresses comparative judgments using appropriate semantic, numerical, or graphical scales. An example of an evaluation scale is the semantic scale proposed by Saaty, shown in Table 2.

Relative importance	Saaty's Scale
Equal	1
	2
Moderate	3
	4
Strong	5
	6
Very Stong	7
	8

Estreme	9

Tab.2 Saaty's Scale

As previously stated, the number of pairwise comparison matrices for each hierarchical level is equal to the number of elements in the higher level relative to which the elements of the current level must be compared. If n is the number of elements to be compared, each matrix will consist of n^2 elements. The most commonly used methods to calculate the weights of each element in a level with respect to element k of the higher level are:

- **Power Method**: Finding the weight vector using the power iteration method;
- **Geometric Mean**: Calculating the geometric mean for each row of the pairwise comparison matrix (the nth root of the product of the row elements) and then normalizing the resulting means against their total;
- **Column Normalization**: Dividing the elements of each column by the column total and then calculating the arithmetic mean of the elements for each row;
- **Row Total Normalization**: Normalizing the totals of each row relative to the sum of all elements in the matrix.

The decision-maker's judgments are perfectly consistent when, for example, in the case of three alternatives, having judged alternative A as twice as good as alternative B, and alternative B as twice as good as alternative C, they judge alternative A as four times better than alternative C. This logical consistency is often not maintained in evaluators' judgments due to:

- Lack of information;
- Lack of concentration;
- The real-world problem being inherently inconsistent, meaning it does not satisfy the property of transitivity Tversky Amos (1969).

In the AHP methodology, such consistency is not strictly required for the pairwise comparison matrix, but the inconsistency must not exceed a specific limit. The methodology allows for an acceptable degree of inconsistency and measures it through the **Consistency Index (CI)**

$$CI= (\lambda_{max}–n)/(n-1)$$

Since n is the order of the pairwise comparison matrix, and λ_{max} is the maximum eigenvalue of the same matrix, which equals n if the judgments are perfectly consistent. The value of λ_{max} is equal to:

$$\lambda_{max} = \frac{(A * W)^T * W'}{n}$$

Where the elements of the matrix W' are:

$$w'_i = \frac{1}{w_i}$$

The methodology allows for a certain degree of inconsistency and measures it through the index $CR = CI/RI$, called the **consistency ratio**, where RI is the average value of the consistency index calculated for randomly generated matrices, as reported in Table.

N	1	2	3	4	5	6	7	8	9	10
RI	0	0	0,52	0,89	1,11	1,25	1,35	1,4	1,45	1,49

Tab.3 The average value of the consistency index calculated for randomly generated matrices

Saaty defined threshold values within which the degree of inconsistency can be considered acceptable: in general, $CR < 0.1$(0.08 for $n = 4$ and 0.05 for $n = 3$).

If this limit value is exceeded, it is appropriate to investigate the causes of the inconsistency and, if necessary, reformulate the judgments or redefine the model, thus reiterating the process until the inconsistency threshold can be considered acceptable.

To determine the scores of the alternatives, the weights relative to each element with respect to the element at the higher hierarchical level are calculated; therefore, the evaluation of each alternative is given by the weighted sum of the alternative's evaluations with respect to each criterion, multiplied by the weights of the criteria themselves.

The weight of each alternative with respect to the overall set of criteria is therefore expressed as follows:

$$S(a_i) = \sum_k w_k * S_k(a_i)$$

essendo:

w_k is the weight of the k criterion;

$S_K(a_i)$ is the measure of alternative *i* under criterion *k* of the higher hierarchical level.

The advantages of the AHP are:

• The analysis can be entirely qualitative;

• It helps to evaluate and synthesize a large number of factors involved in a complex decision;

• It is able to handle a certain degree of inconsistency on the part of decision-makers, within limits considered acceptable.

One drawback, however, is the difficulty in expressing judgments when faced with a large set of alternatives (strategic actions), which leads to integrating the AHP method with other methodologies such as the Weighted Method, TOPSIS, etc.

5.2.4 Efficient, Pareto-optimal, or non-dominated solutions

In a multicriteria model, a feasible solution is non-dominated if and only if there exists no other feasible solution that achieves a better value for at least one criterion and no worse value for any other.

Non-dominated alternatives form the set of Pareto-optimal alternatives, that is, those alternatives for which no other feasible alternative exists that can produce an improvement in one objective/attribute without worsening at least one other.

A feasible solution is dominated if and only if there exists at least one other feasible solution that achieves a better value for at least one criterion and no worse value for any other. Figure 13 shows an example of Pareto alternatives/solutions.

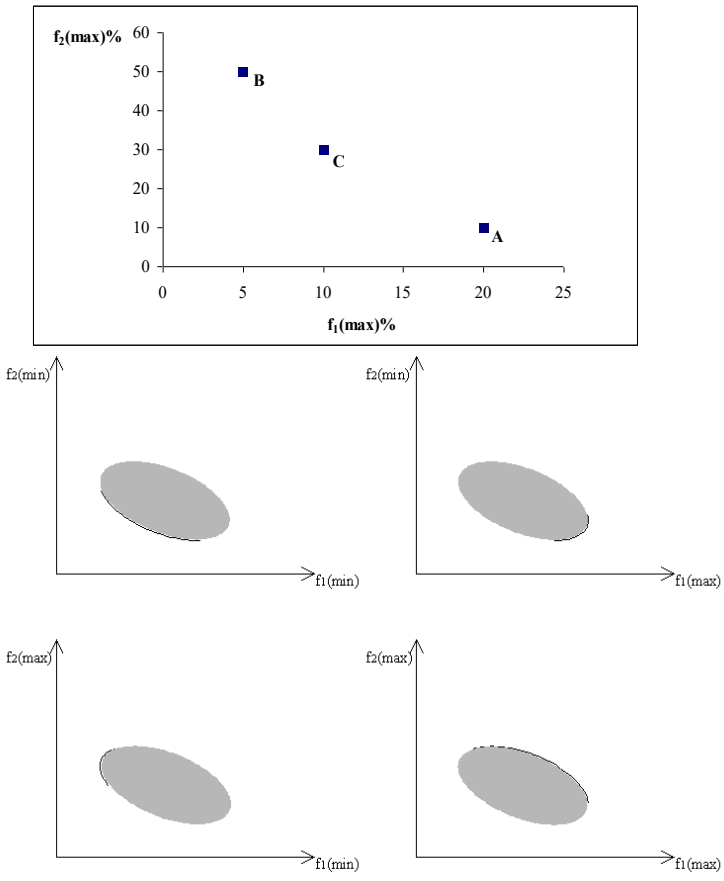

Fig.13 Pareto solutions

5.2.5 A model for evaluating elementary strategic actions and alternatives

To address ranking alternatives, multi-attribute MCDM (Multi-Criteria Decision Making) methodologies can be used, such as AHP, TOPSIS, ELECTRE, PROMETHEE, EVAMIX, VIKOR, DEMATEL, etc. (Alireza Alinezhad et al., 2019). Moreover, the approach may be deterministic or based on uncertainty in the evaluations. Once a quantitative ranking of elementary strategic actions has been obtained, overall strategies can be defined through the composition of individual strategic actions, taking into account the importance calculated for each elementary strategic action with respect to the objectives; overall strategies can then be evaluated against the objectives. To apply these methodologies, it is obviously necessary to rely on experts capable of expressing quantitative and/or qualitative evaluations. The quality of the experts is essential to obtain good results; therefore, expert selection is always a critical phase in solving quantitative ranking alternatives.

From observation of Figure 10, in which the lines represent the relationships between objectives and problems, and between problems and strategic actions (through subcategories that are not explicitly shown in Figure 10 for ease of representation, without loss of generality, the subcategories are represented in fig.14 e fig15), it can be noted that the problem has a hierarchical structure typical of issues addressed using AHP. However, Figure 10 also shows that the hierarchical representation is not comparable either to the complete hierarchy shown in Figure 11 or to the incomplete one shown in Figure 12; therefore, the AHP model does not seem applicable in a canonical way, also considering the homogeneity axiom discussed in Section 5.2.3.

To overcome this difficulty, it is proposed to divide the evaluation problem into two distinct hierarchical structures: one related to the first objective, customer satisfaction, and the other related to the second objective, reduction of return management costs fig.14 e fig15. The AHP technique is then applied to each of these hierarchical structures. It should be noted that the importance that top management assigns to each objective relative to the other depends on the company's contingent situation, according to which the importance attributed to the two objectives varies. Conversely, the relative importance of a problem (barrier) with respect to a single objective depends little on the contingent situation; therefore, the weights of the problems with respect to each objective are only weakly variable as a function of the contingent situation. Therefore, it was decided to separate the two analyses with respect to the two aforementioned objectives, since management will then decide how much weight should be given to the first objective and how much to the second. Furthermore, the so-called Pareto solutions will be determined, among which the optimal strategic actions will be sought.

Furthermore, given the nature of the problem, it is not appropriate for the use of AHP to extend to the inclusion of strategic actions or alternatives, since these are so numerous that they would exceed the limit of 9 imposed by Saaty. Based on Miller's (1956) work on the cognitive limit of "7 ± 2" in human information-processing capacity, Saaty adopted, as a practical rule for designing pairwise comparisons, the avoidance of too many simultaneous alternatives (criteria). As the number of elements increases, judgment consistency tends to decrease and cognitive load becomes excessive (Thomas L. Saaty et al., 2003).

In light of the considerations above, and in order to ensure both procedural simplicity and model credibility, it is proposed to:

- apply the AHP technique to the two separate hierarchical structures identified with respect to the two objectives, excluding the strategic actions (Fig.14 and 15), by evaluating the weights of the problems and of the problem subcategories;
- subsequently, to evaluate the importance of individual strategic actions or combined strategic actions with respect to the problem subcategories, apply the SAW (Simple Additive Weighting) method;
- Once the weights of the problems, the subcategories, and the strategic actions with respect to the problem subcategories have been determined, the effects of the strategic actions on the problems and on the two reference objectives can be calculated.
- Pareto-optimal solutions are identified.

Through the previous procedure the evaluation of strategic actions with respect to each of the two aforementioned objectives, considered separately, is obtained. Taking these evaluations into account, top management can make its decisions according to the chosen policy with respect to the two objectives. A useful post-processing of the results consists in identifying Pareto-optimal (Pareto-efficient) actions or alternatives, that is, determining which strategic actions are non-dominated with respect to the two objectives of the problem, and to which top management should pay particular attention when defining an overall strategy.

For the evaluation of strategic actions with respect to the problem subcategories, for simplicity a qualitative scale from 0 to 4 is proposed, where the numerical variables correspond to linguistic variables as shown in Table 1.

5.2.5.1 Application of the model

The procedure to be applied is as follows:

1. The two hierarchical structures are defined, including subcategories, problems, and the considered objectives—either *customer satisfaction* or *reduction of return management costs* (Figures 14 and 15 in APPENDIX).

2. Pairwise comparison matrices among the problems with respect to each objective are evaluated.
3. Pairwise comparison matrices among the subcategories of each problem (barrier) are evaluated with reference to the same problem.
4. The weight vector for the problems is calculated.
5. The weight vector for each individual subcategory with respect to the reference problem is calculated.
6. For both vectors, compliance with the consistency constraint is verified; if the constraint is satisfied, the procedure continues, otherwise the pairwise comparisons must be reassessed.
7. For each strategic action (alternative) (Tab.4 in APPENDIX), the weight with respect to each subcategory (Tab.5 in APPENDIX) is evaluated according to the evaluation scale reported in Tab.1. The evaluation of strategic actions is done only with respect to the subcategories that refer to problems connected with the strategic actions as reported in the fig.10, since some links are considered negligible.
8. The weight of each strategic action with respect to each problem and to the objective is calculated.
9. Strategic actions are ranked according to their importance with respect to the considered objective.
10. Strategic actions are represented in the bidimensional domain of the objectives: *customer satisfaction (objective 1)* and *reduction of return management costs (objective 2)*.
11. Pareto-optimal solutions are identified.

The scale used for pairwise comparisons ranges from 1 to 9.

For the elicitation of pairwise comparison matrices and the weights of strategic actions, several approaches may be adopted: structured interviews, questionnaires, or workshops.

A structured interview is a data collection technique in which predefined, sequential, and coherent questions are posed to the respondent. The facilitator/researcher does not request general judgments, but rather systematic pairwise comparisons. Questions are established in advance, with a precise order and formulation. The interviewer follows a script, maintaining the same structure for each interview. This method enables straightforward comparison of responses across different stakeholders.

A questionnaire is a written instrument consisting of a series of questions completed independently by participants. It may be administered in either paper-based or digital format. Questions can be closed-ended and based on predefined scales (e.g., the Saaty scale). This approach allows standardized data collection from a large number of respondents.

A workshop is a collaborative session involving multiple stakeholders, facilitated by a moderator, in which topics are explored, perspectives are shared, and requirements, ideas, or solutions are generated. Workshops bring participants together in the same time and space, fostering direct discussion and negotiation of priorities, and may include visual techniques. The advantages of a workshop include:

- enhancing participants' understanding of the issue under analysis;
- promoting alignment among participants;
- encouraging creativity and the development of shared solutions.

In this study, reference was made to two individuals with substantial expertise in the subject matter of the thesis. Both participants developed their experience in return management within a company operating in the sector, which cannot be disclosed for confidentiality reasons. Indeed, formal authorization from top management would have been required, and due to procedural complexity and time constraints, this was not feasible.

A workshop approach was selected because only two participants were involved, and mutual discussion was preferred so that they could share the reasoning underlying their judgments. This approach also helped reduce inconsistencies through direct comparison between the two experts. For each pairwise comparison (i.e., between problems with respect to the two main objectives and between subcategories with respect to the problems), participants were first asked to identify the more important component. Once a shared judgment was reached, they were asked to represent the relative importance of the two elements by marking proportional segments on a line. The ratio between these segments was then used to derive the corresponding element of the pairwise comparison matrix.

In the few cases where consensus was not achieved regarding the proportional length of the segments, the geometric mean of the two matrix elements derived from the individual expert judgments was calculated. Two sessions were conducted in order to complete all pairwise comparisons. During the second session, the strategic actions were also evaluated on a scale from 0 to 4 with respect to the problem subcategories.

. However, the assessment of pairwise comparisons and weights remains an aspect that requires further investigation. To calculate the weight of each strategic action with respect to one of the two objectives, the following are defined:

A ia a matrix with a number of rows equal to the number of strategic actions and a number of columns equal to the number of subcategories. The generic element a_{ij}represents the evaluation of strategic action i with respect to subcategory j.

B is a vector whose order is equal to the number of subcategories, where $b_k$denotes the weight of subcategory k, calculated using the Analytic Hierarchy Process (AHP) with respect to the reference problem (barrier).

C is a vector whose order is equal to the number of considered problems (barriers), where $c_s$represents the weight of problem s with respect to the considered objective.

F is a matrix with a number of rows equal to the number of subcategories and a number of columns equal to the number of problems. The generic element f_{rt} is equal to 1 if subcategory *r* refers to problem *t*, and 0 otherwise.

P is a vector in which each element represents the score associated with the considered objective.

Based on the above matrices, the weight of the strategic action with respect to the considered objective is given by:

$$P = (A \times B^T) * F * C$$

where $\times$ denotes the element-wise product between each element of the *i*-th row of **A** and each element of matrix B^T, and $*$ denotes the standard row-by-column matrix product. In the application, A_1, B_1, C_1, F_1, P_1 refer to Objective 1, while A_2, B_2, C_2, F_2, P_2 refer to Objective 2 as reported in the APPENDIX (tables from 6 to 13). For the calculations related to AHP, the platform https://*onlineoutput.com* was used. Tables 14 and 15 report the scores of the strategic actions with respect to Objective 1 and Objective 2, respectively.

	Action score for objective 1: customer satisfaction	
1	0,478	Investing in technology
2	0,485	Investing in employee skills
3	0,597	Investing in customer service
4	0,857	Providing accurate and timely information to customers
5	0,300	Systematic use and analysis of return codes, reviews, feedback
6	0,144	Customer profiling in relation to returns and frequent returners
7	0,160	Investing in consumer awareness
8	0,668	Refining the calculation of return costs
9	0,518	Incentivising customers not to return products
10	0,300	Reducing return cycle time
11	0,429	Defining clear policies and processes
12	0,715	Establishing strong collaboration among supply chain members
13	0,841	Decentralising gatekeeping

Tab.13 The strategic actions scores for Ob 1

	Action score for objective 2: reduction of costs in managing returns	
1	0,420	Investing in technology
2	0,352	Investing in employee skills
3	0,563	Investing in customer service
4	0,588	Providing accurate and timely information to customers
5	1,122	Systematic use and analysis of return codes, reviews, feedback
6	1,037	Customer profiling in relation to returns and frequent returners
7	0,329	Investing in consumer awareness
8	0,573	Refining the calculation of return costs
9	0,411	Incentivising customers not to return products
10	0,237	Reducing return cycle time
11	0,233	Defining clear policies and processes
12	0,577	Establishing strong collaboration among supply chain members
13	0,684	Decentralising gatekeeping

Tab.14 The strategic actions scores Ob 2

Figure 16 shows, in a diagram, the scores obtained by the strategic actions with respect to the two objectives: the x-axis represents the score with respect to Objective 1, while the y-axis represents the score with respect to Objective 2. In Table 14, the actions belonging to the first Pareto frontier are highlighted in green, while the strategic actions belonging to the second Pareto frontier are highlighted in yellow (the second Pareto frontier is obtained by excluding the actions belonging to the first Pareto frontier).

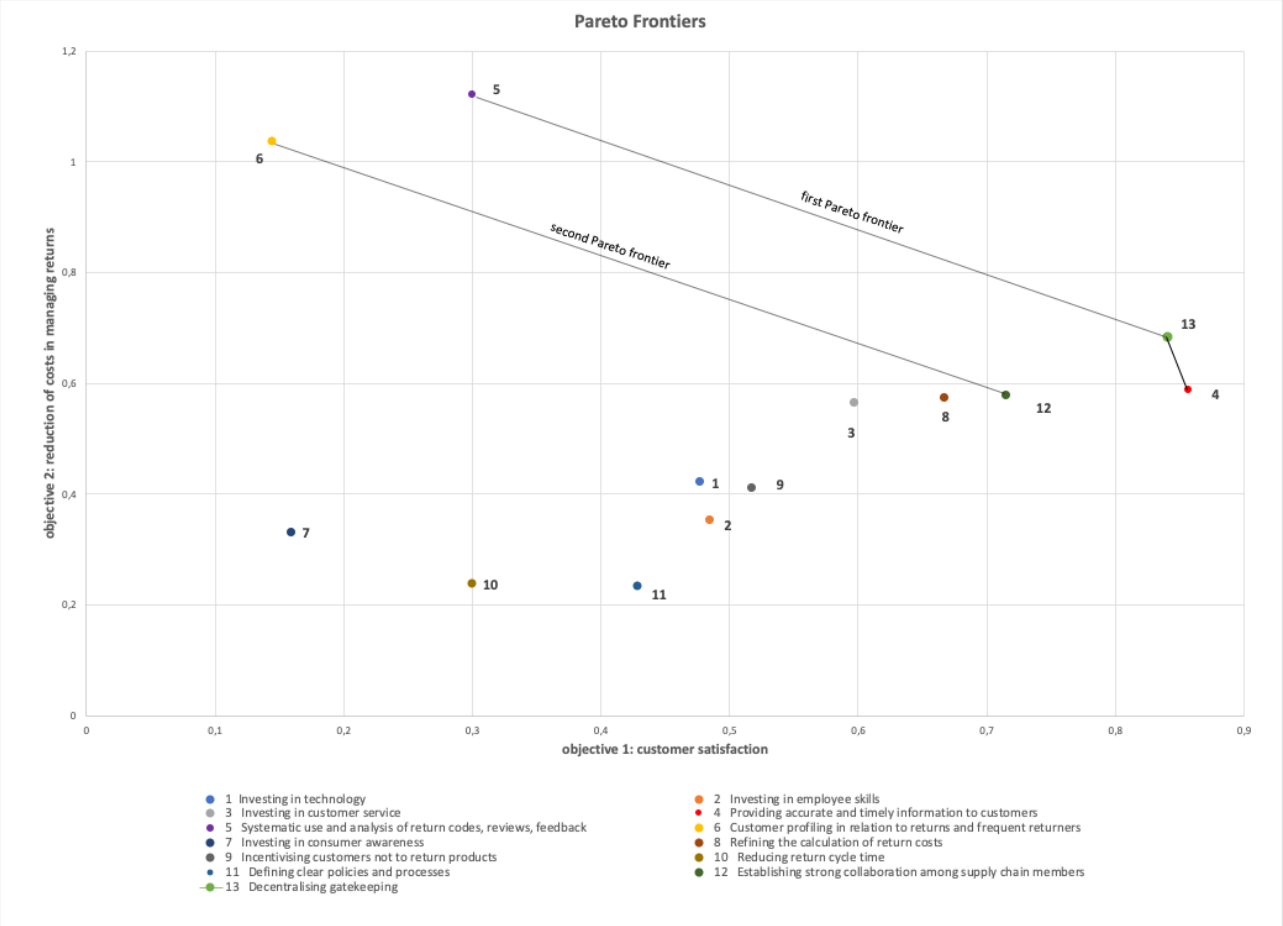

Fig.16 Pareto Frontiers

The solutions could be weighted according to the importance that top management assigns to each of the two objectives, thus obtaining a strict ranking; however, this would result in a loss of information. As already noted, a model is only a partial representation of reality and serves to support, guide, and justify decisions; therefore, it should not be represented in an excessively rigid manner. In this respect, it is certainly interesting to assume uncertain evaluation variables in order to provide additional flexibility to the model.

From Figure 14, it can be observed that along the ~~first~~ Pareto frontier, as the value of Objective 1 increases, the value of Objective 2 decreases; ~~the same behavior is observed for the second Pareto frontier.~~ This confirms that the two objectives are in conflict with each other, as expected: an action that favors Objective 1 tends to disadvantage Objective 2, and vice versa.

Conclusions

In this work, I first analysed the development of e-commerce, with particular reference to the United States and Europe, and also reported growth forecasts for the United States up to 2029. From both historical data and forecasts, it emerges that the e-commerce sector is continuously growing and that,

even today, there are no signs of slowdown. On the contrary, the growth gradient appears to remain constant over time, if not even increasing. In fact, when considering the periods from 2022 to 2025 based on historical data and from 2025 to 2029 based on forecasts, a significant increase in the growth gradient can be observed. I identified the competitiveness factors of e-commerce compared to traditional commerce. Furthermore, it is evident that e-commerce is characterised by a paradigm shift with respect to traditional distribution. A fundamental element of this new paradigm is that the customer, previously a passive subject, has become an active one. Moreover, e-commerce brings the market closer to conditions of perfect competition, as the information available to both customers and sellers increases thanks to the use of the internet.

However, alongside the growth of e-commerce and the opportunities it offers, several critical issues have emerged, including the management of returns, which are continuously increasing and entail significant costs for companies. Returns management is a complex process, as it involves the customer, logistics, inventory management, recovery technologies, environmental impact and reduced liquidity. Data indicate an upward trend in online purchase returns, which can result in considerable diseconomies for firms. The management of returns is precisely the central theme of this thesis, which aims to: analyse the reasons for returns; highlight the problems that companies face when implementing a returns management policy; and understand the objectives that companies must pursue in order to manage returns effectively.

Finally, several basic strategic actions that companies can adopt to implement an effective returns policy were outlined. Subsequently, through a decision-making model, these strategic actions were evaluated in relation to corporate objectives. In order to achieve these aims, the returns management process was first illustrated within the framework of the eight business processes that must be implemented within companies and across supply chain partners, according to the Global Supply Chain Forum (GSCF). The cost structure of returns management was analysed, and an example of returns management relating to a well-known e-commerce company was also presented.

Consumer behaviour in relation to returns was then analysed, with the aim of understanding how such behaviour can influence a company's returns policy. From a strategic perspective, two objectives that companies must pursue were identified:

- reduction of costs in returns management;
- maximisation of customer satisfaction.

The problems (barriers) that companies must address in order to achieve these objectives were then identified and subsequently broken down into elements (subcategories) that collectively represent each problem. Based on this structure, the weights of the problems with respect to each objective and the weights of the subcategories with respect to the relevant problem were determined using the AHP technique.

Elementary strategic actions that companies can implement were then identified. These actions were evaluated against the strategic objectives on the basis of the above structure and through the use of the SAW technique. Each strategic action, through the values it assumes with respect to the two objectives, was represented on a Cartesian plane. Consequently, the so-called Pareto-optimal solutions, namely the non-dominated solutions, were identified.

This thesis set out to describe the returns process and analyse the strategies that companies can adopt in order to: ensure customer satisfaction, safeguard corporate profitability, minimise the negative effects of returns, and transform the issue of returns from a problem into a source of value for the company. Furthermore, in order to operationally define the most appropriate strategy to be implemented, the thesis aimed to propose a model for optimising managerial decision-making in relation to returns management. The proposed optimisation model differs from those suggested by various authors, some of whom have used AHP in combination with the TOPSIS technique instead of the SAW technique adopted in this study, in two main respects:

- other authors did not propose general objectives on the basis of which to evaluate strategic actions;
- they did not identify the so-called Pareto-optimal solutions.

The limitations of this study are as follows and could be object of future developments.

- the interview methods for evaluating pairwise comparisons (AHP) and weights (SAW) were not examined in depth;
- the evaluations were carried out with reference to a relatively small panel;
- the evaluations were conducted under conditions of certainty;
- the objective relating to environmental sustainability was not considered; however, this does not undermine the methodological approach.

References

Agyapong, H. A. (2017). Exploring the influential factors of online purchase (Thesis). Vaasan Ammattikorkeakoulu University of Applied Sciences, Finland.

Aksoylu S., Demirel N. (2018). Application of Activity Based Costing in Reverse Logistics Environment. Journal of Business Research-Turk, 10(4), 953–973.

Alinezhad A., Khalili J. (2019). *New Methods and Applications in Multiple Attribute Decision Making (MADM)*. Springer.

Amorim P., Wagner L., Calvo E. (2023). How E-commerce Companies Can Reduce Returns. MIT Sloan Management Review.

Anthes, G.H. (1994). Internet debates metered billing. Computerworld, 28(21), 1–2.

APICS (2017). Supply Chain Operations Reference Model SCOR Version 12.0.

Asdecker B. (2015). Returning mail-order goods: analyzing the relationship between the rate of returns and the associated costs. Logistics Research, 8, Article 3.

Ataei, Y.A., Mahmoudi, M., Feylizadeh R., Li D.F. (2020). Ordinal Priority Approach (OPA). Applied Soft Computing, 86.

Autry C.W., Daugherty P.J., Richey G.R. (2001). The Challenge of Reverse Logistics in Catalog Retailing. Int. Journal of Physical Distribution & Logistics Management, 31(1), 26–37.

Bendle N., Farris P.W., Pfeifer P.E., Reibstein D.J. (2016). *Marketing Metrics*. Pearson.

Brynjolfsson, E., Smith, M.D. (2000). Frictionless Commerce? Management Science, 46(4), 563–585.

Bucko J., Kakalejčík L., Ferencová M. (2018). Online shopping: Factors that affect consumer purchasing behaviour. Cogent Business & Management, 5(1).

Chaffey, D., Ellis-Chadwick, F. (2019). *Digital Business and E-commerce Management* (7th ed.). Pearson.

Costa, E. (2001). *Global e-commerce strategies for small business*. MIT Press.

Dale SR., (2002). The Returns Management Process. International Journal of Logistics Management, 13(2), 1–18.

Desai A., Sreenivasa Rao M. (2020). A Study on Customer Online Returns. International Journal of Management, 11(9), 1218–1222.

Douglas M., Cooper M., Pagh J.D. (1998). Supply Chain Management. International Journal of Logistics Management, 9(2).

Drury C. (2021). *Management and Cost Accounting* (11th ed.).

El Kihal S., Erdem T., Schulze C. (2025). Customer return rate evolution. International Journal of Research in Marketing.

Fellenstein, C., Wood, R. (2000). *Exploring e-commerce, global e-business, and e-societies*.

Frei R., Jack L., Brown S. (2020). Product returns: a growing problem. IJOPM, 40(10), 1613–1621.

Goldsby T.J., Closs D.J. (2000). Using activity-based costing to reengineer the reverse logistics channel. IJPDLM, 30(6), 500–514.

Gupta S., Lehmann D.R. (2006). Customer Lifetime Value and Firm Valuation. Journal of Relationship Marketing.

Huong T.T., Thuy Dung N., Anh Tu P.T. (2024). Barriers to Reverse Logistics in Vietnam. JST.

Hsueh J., Lin C. (2015). Integrating AHP and TOPSIS in reverse logistics. Journal of Manufacturing Systems, 37, 599–615.

Janakiraman N., Syrdal H., Freling R.E. (2016). How to design a return policy. Harvard Business Review.

Karl D. (2024). Forecasting e-commerce consumer returns. Management Review Quarterly.

Kaushik V., Kumar A., Gupta H., Dixit G. (2022). Modelling online apparel return. Electronic Commerce Research.

Kim, J. (1998). Universal service and Internet commercialization. Telecommunication Policy, 22, 281–288.

Kiro, R. (2015). Reverse logistics in e-com: a trust factor. Cargo Connect.

Kotler P., Kartajaya H., Setiawan I. (2017). *Marketing 4.0*. Wiley.

Kumar V., Reinartz W. (2016). Creating Enduring Customer Value. Journal of Marketing.

Kumar V., Shah D. (2009). Expanding the role of marketing. Journal of Marketing, 73(6).

Laudon K.C., Traver C.G. (2021). *E-commerce: Business, Technology, Society* (16th ed.).

Lindsey, K. (2016). Why retail has a growing reverse supply chain problem. RetailDive.

Lo Martire G. (2016). *Il controllo di gestione*. Franco Angeli.

Marriott J., Bektas T., Leung E.K.H., Lyons A. (2025). The billion-pound question in fashion e-commerce. Transportation Research Part E.

Masínová V., Svandová Z. (2014). Factors defining satisfaction and loyalty. ECIE Conference Proceedings.

Miller G.A. (1956). The magical number seven. Psychological Review, 63(2), 81–97.

Mirakhorli A. (2010). Multi-objective optimization of reverse logistics network. ICCIE.

Mollenkopf D.A. et al. (2007). Managing internet product returns. Decision Sciences, 38(2), 215–250.

National Retail Federation (2024). Consumer Returns in Retail Industry.

Naseem M.H., Yang J., Xiang Z. (2021). Prioritizing Reverse Logistics Barriers. Sustainability, 13(22).

Nel J.D., Badenhorst A. (2020). Reverse logistics challenges in e-commerce. Int. J. Business Performance Management.

Pei Z., Paswan A. (2018). Consumers' product return behaviors. Journal of Electronic Commerce Research, 19(4), 301–319.

Petersen J.A., Kumar V. (2009). Are product returns a necessary evil? Journal of Marketing, 73(3).

Pilík M. (2013). Selected factors influencing customers' behaviour. ECIME Proceedings.

Prajapati H., Kant R., Shankar R. (2019). Reverse logistics review. Journal of Cleaner Production, 211, 503–520.

Prakash C., Barua M.K. (2015). AHP-TOPSIS for reverse logistics adoption. Journal of Manufacturing Systems, 37, 599–615.

Prayogo D.H., Domanski R., Golinska-Dawson P. (2024). Improving Returns Management in Indonesia. Sustainability, 16.

Rajyalakshmi N. (2015). Factors influencing online shopping behavior. IJOM, 5(1), 38–50.

Reichheld F. (2003). One Number You Need to Grow. Harvard Business Review.

Roichman R. et al. (2024). The convenience economy. Resources, Conservation & Recycling, 210.

Roztocki N. (2010). Activity-Based Management for Electronic Commerce. JTAER, 5(1), 1–10.

Röllecke F.J., Huchzermeier A., Schröder D. (2017). The Hidden Strategic Opportunity of Returns Management. California Management Review.

Russo I. (2008). *La gestione dei resi nelle catene di fornitura*.

Saarijärvi H., Sutinen U., Harris L.C. (2017). International Review of Retail, Distribution & Consumer Research, 27(3), 284–299.

Saaty T.L. (1994). *Fundamentals of Decision Making and Priority Theory with the AHP*.

Saaty T.L. (2000). On the relativity of relative measures. European Journal of Operational Research, 121(1), 205–212.

Saaty T.L., Mujgan O.S. (2003). Why the magic number seven plus or minus two. Mathematical and Computer Modelling, 38, 233–244.

Sahu A.K., Nandy I., Shardeo V., Padhy R. (2025). Opportunistic Returns in E-Commerce. International Social Science Journal.

Saarijärvi H., Sutinen U., Harris L.C. (2017). International Review of Retail Distribution & Consumer Research.

Sawabini, S. (2001). EDI and the Internet. Journal of Business Strategy, 22(1), 41–43.

Seghezzi A. et al. (2021). Investigating the Return Cost for B2C e-commerce.

Sirisawat P., Kiatcharoenpol T. (2018). Fuzzy AHP-TOPSIS approaches. Computers & Industrial Engineering, 117, 303–318.

Solanki, A. (2018). Reverse logistics trends: the returns are in.

Tian T., Stewart C. (2007). History of E-Commerce.

Tversky A. (1969). Intransitivity of preferences. Psychological Review, 76(1), 31–48.

Vargas L.G. (1990). An overview of the analytic hierarchy process. European Journal of Operational Research, 48(1).

Voigt D. et al. (2019). Performance Evaluation of Reverse Logistics. Sustainability, 11(19), 5291.

Wang C.N., Dang T.T., Nguyen N.A.T. (2021). Outsourcing Reverse Logistics. Axioms, 10(34).

Wibowo M.A. (2022). Reverse Logistics Performance Indicators. Sustainability, 14(2), 963.

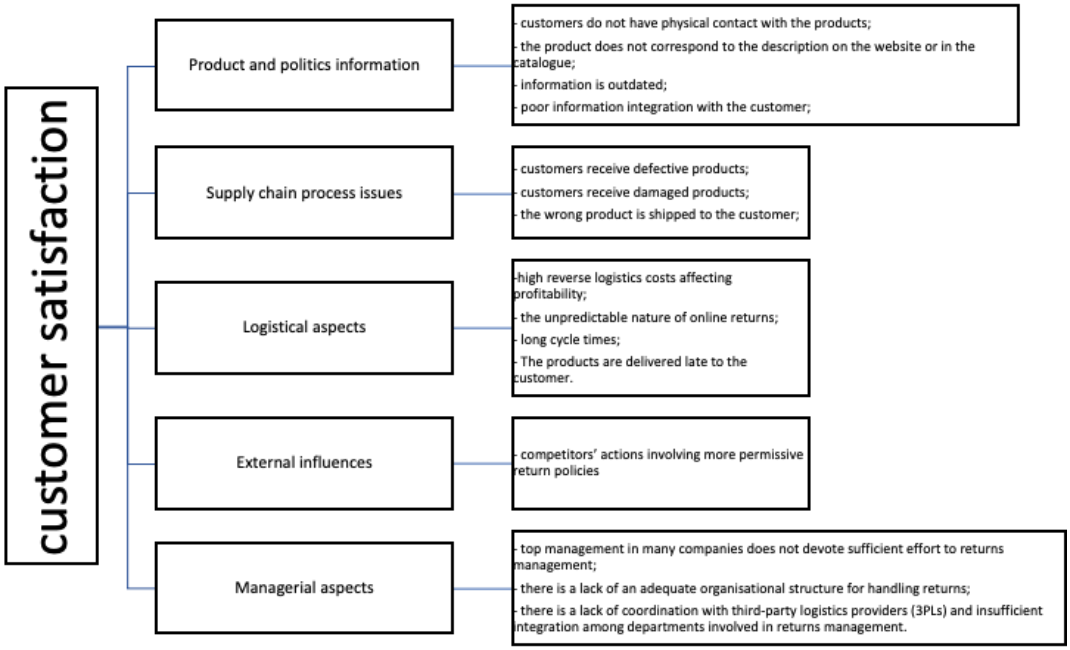

Fig.14 Customer satisfaction criteria

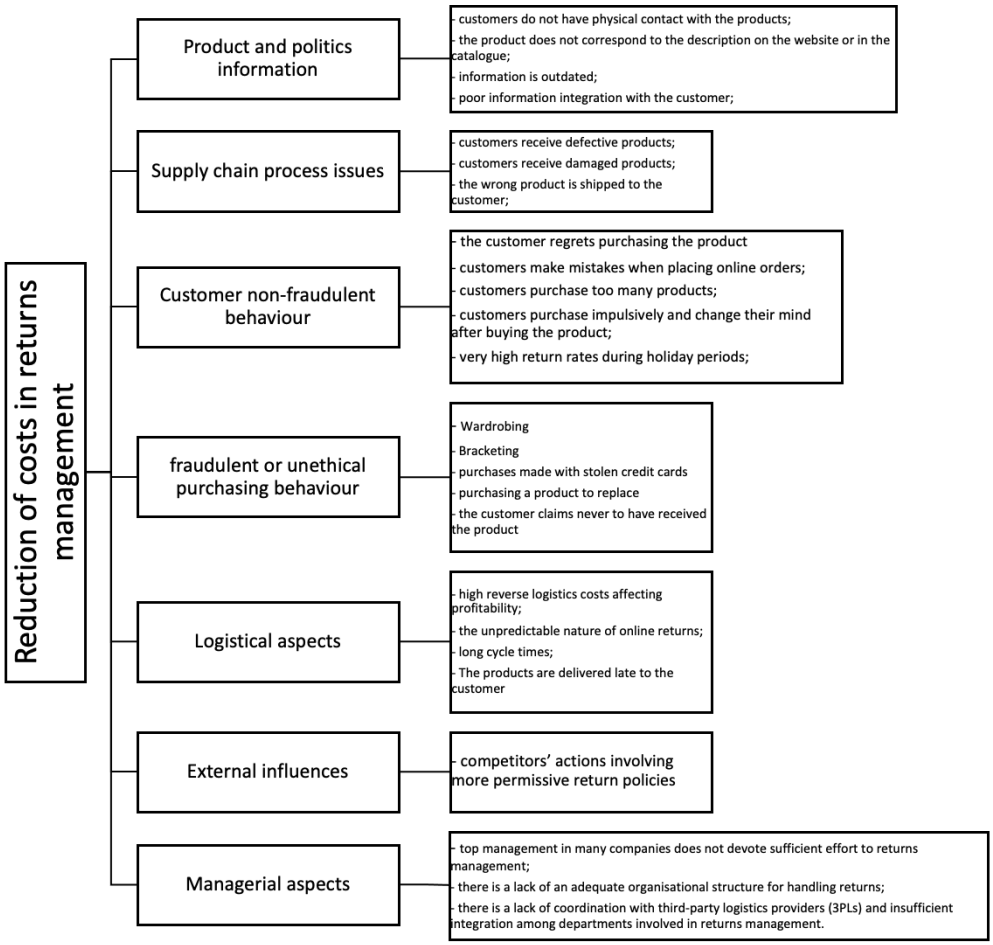

Fig.15 Reduction cost criteria

Strategic Actions
Investing in technology
Investing in employee skills
Investing in customer service
Providing accurate and timely information to customers
Systematic use and analysis of return codes, reviews and feedback
Customer profiling in relation to returns and blacklisting frequent returners
Investing in consumer awareness
Refining the calculation of return costs
Incentivising customers not to return products
Reducing return cycle time
Defining clear policies and processes
Establishing strong collaboration among supply chain members
Decentralising gatekeeping

Tab.4 Strategic Actions

Sub categories
- customers do not have physical contact with the products; - the product does not correspond to the description on the website or in the catalogue; - information is outdated; - poor information integration with the customer;
-customers receive defective products; - customers receive damaged products; - the wrong product is shipped to the customer;
- the customer regrets purchasing the product - customers make mistakes when placing online orders; - customers purchase too many products; - customers purchase impulsively and change their mind after buying the product; - very high return rates during holiday periods;
- Wardrobing - Bracketing - purchases made with stolen credit cards; - purchasing a product in order to replace it with a damaged or old one; - the customer claims never to have received the ordered goods;
- high reverse logistics costs affecting profitability; - the unpredictable nature of online returns; - long cycle times; - The products are delivered late to the customer.
-competitors' actions involving more permissive return policies
- top management in many companies does not devote sufficient effort to returns management; - there is a lack of an adequate organisational structure for handling returns; - there is a lack of coordination with third-party logistics providers (3PLs) and insufficient integration among departments involved in returns management.

Tab.5 Sub categories

	A1 matrix														
	informazioni sul prodotto				problemi catena fornitura			Aspetti logistici				infl. esterne	Aspetti gestion.		
	- customers do not have physical contact with the products	- the product does not correspond to the description	- information is outdated	- poor information integration with the customer	-customers receive defective products	- customers receive damaged products	- the wrong product is shipped to the customer	- high reverse logistics costs affecting profitability	- the unpredictable nature of online returns	- long cycle times	- the products are delivered late to the customer	-competitors' actions involving more permissive return policies	- top management in many companies does not devote sufficient effort	- there is a lack of an adequate organizational structure for handling returns	- lack of coordination with 3PL, insufficient integration among departments
Investing in technology	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Investing in employee skills	0	0	0	2	0	0	0	0	0	3	0	0	0	2	0
Investing in customer service	2	0	0	3	0	0	0	0	0	0	0	2	0	0	0
Providing accurate and timely information to customers	3	4	4	1	0	0	0	0	0	0	0	1	0	0	0
Systematic use and analysis of return codes, reviews, feedback	0	0	0	0	3	3	3	0	0	0	0	0	0	0	0
Customer profiling in relation to returns and frequent returners	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Investing in consumer awareness	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Refining the calculation of return costs	0	0	0	0	0	0	0	4	0	0	0	0	0	4	0
Incentivising customers not to return products	0	3	0	0	0	3	1	0	0	0	0	0	0	0	0
Reducing return cycle time	0	0	0	0	0	0	0	2	0	4	0	0	0	0	0
Defining clear policies and processes	0	1	1	4	0	0	0	0	0	0	0	0	0	0	0
Establishing strong collaboration among supply chain members	0	0	0	0	0	0	0	3	0	2	4	0	0	0	4
Decentralising gatekeeping	0	0	0	0	0	0	0	3	0	3	0	0	2	4	0

Table 6 A_1 matrix

A2 matrix																									
				product information				supply chain process issues			customer non-fraudulent behaviour					fraudulent or unethical purchasing behaviour					logistical aspects				external influences	managerial aspects		
				- customers do not have physical contact with the products	- the product does not correspond to the description	- information is outdated	- poor information integration with the customer	-customers receive defective products	- customers receive damaged products	- the wrong product is shipped to the customer	- the customer regrets purchasing the product	- customers make mistakes when placing online orders	- customers purchase too many products	- customers purchase impulsively and change their mind after buying	- very high return rates during holiday periods	Wardrobing	Bracketing	- purchases made with stolen credit cards	- purchasing a product in order to replace it with a damaged or old one	- the customer claims never to have received the ordered goods	- high reverse logistics costs affecting profitability	- the unpredictable nature of online returns	- long cycle times	- the products are delivered late to the customer	-competitors' actions involving more permissive return policies	- top management in many companies does not devote sufficient effort	- there is a lack of an adequate organisational structure for handling returns	- lack of coordination with 3PL, insufficient integration among departments
	Investing in technology			0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	3
	Investing in employee skills			0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0
	Investing in customer service			2	0	0	3	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
	Providing accurate and timely information to customers			3	4	4	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Systematic use and analysis of return codes, reviews, feedback			0	0	0	0	3	3	3	1	0	0	0	0	4	4	3	3	3	0	0	0	0	0	0	0	0
	Customer profiling in relation to returns and frequent returners			0	0	0	0	0	0	0	0	0	3	0	1	4	4	4	4	4	0	3	0	0	0	0	0	0
	Investing in consumer awareness			0	0	0	2	0	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0
	Refining the calculation of return costs			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	0
	Incentivising customers not to return products			0	3	0	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Reducing return cycle time			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	0	0
	Defining clear policies and processes			0	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Establishing strong collaboration among supply chain members			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	4	0	0	0	4
	Decentralising gatekeeping			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	2	4	0

Table 7 A_2 matrix

B1 matrix		
product information	- customers do not have physical contact with the products	0,297
	- the product does not correspond to the description	0,281
	- information is outdated	0,126
	- poor information integration with the customer	0,297
supply chain process	-customers receive defective products	0,407
	- customers receive damaged products	0,37
	- the wrong product is shipped to the customer	0,224
logistical aspects	- high reverse logistics costs affecting profitability	0,389
	- the unpredictable nature of online returns	0,26
	- long cycle times	0,211
	- the products are delivered late to the customer	0,14
external influences	-competitors' actions involving more permissive return policies	1
managerial aspects	- top management in many companies does not devote sufficient effort	0,199
	- there is a lack of an adequate organisational structure for handling returns	0,455
	- lack of coordination with 3PL, insufficient integration among departments	0,347

Tab.8 B_1 Vector

B2 matrix		
informazioni sul prodotto	- customers do not have physical contact with the products	0,297
	- the product does not correspond to the description	0,281
	- information is outdated	0,126
	- poor information integration with the customer	0,297
processi della catena di fornitura	-customers receive defective products	0,407
	- customers receive damaged products	0,37
	- the wrong product is shipped to the customer	0,224
comportamento non fraudolente del cliente	- the customer regrets purchasing the product	0,264
	- customers make mistakes when placing online orders	0,241
	- customers purchase too many products	0,091
	- customers purchase impulsively and change their mind after buying	0,14
	- very high return rates during holiday periods	0,264
Comportamento fraudolento del cliente	- Wardrobing	0,158
	- Bracketing	0,552
	- purchases made with stolen credit cards	0,107
	- purchasing a product in order to replace it with a damaged or old one	0,109
	- the customer claims never to have received the ordered goods	0,075
Aspetti logistici	- high reverse logistics costs affecting profitability	0,389
	- the unpredictable nature of online returns	0,26
	- long cycle times	0,211
	- the products are delivered late to the customer	0,14
Influenze esterne	-competitors' actions involving more permissive return policies	1
Aspetti gestionali	- top management in many companies does not devote sufficient effort	0,199
	there is a lack of an adequate organisational structure for handling returns	0,455
	- lack of coordination with 3PL, insufficient integration among departments	0,347

Tab.9 B_2 Vector

C1 matrix	
product information	0,269
supply chain process issues	0,218
logistical aspects	0,185
external influences	0,099
managerial aspects	0,229

Tab.10 C_1 Vector

C2 matrix	
product information	0,146
supply chain process issues	0,1
customer non-fraudulent behaviour	0,146
fraudulent or unethical purchasing behaviour	0,211
logistical aspects	0,146
external influences	0,061
managerial aspects	0,19

Tab.11 C_2 Vector

F1 matrix	product information	supply chain process issues	logistical aspects	external influences	managerial aspects
- customers do not have physical contact with the products	1	0	0	0	0
- the product does not correspond to the description	1	0	0	0	0
- information is outdated	1	0	0	0	0
- poor information integration with the customer	1	0	0	0	0
-customers receive defective products	0	1	0	0	0
- customers receive damaged products	0	1	0	0	0
- the wrong product is shipped to the customer	0	1	0	0	0
- high reverse logistics costs affecting profitability	0	0	1	0	0
- the unpredictable nature of online returns	0	0	1	0	0
- long cycle times	0	0	1	0	0
- the products are delivered late to the customer	0	0	1	0	0
-competitors' actions involving more permissive return policies	0	0	0	1	0
- top management in many companies does not devote sufficient effort	0	0	0	0	1
- there is a lack of an adequate organisational structure for handling returns	0	0	0	0	1
- lack of coordination with 3PL, insufficient integration among departments	0	0	0	0	1

Tab.12 F_1 matrix

F2 matrix	product information	supply chain process issues	customer non-fraudulent behaviour	fraudulent or unethical purchasing behaviour	logistical aspects	external influences	managerial aspects
- customers do not have physical contact with the products	1	0	0	0	0	0	0
- the product does not correspond to the description	1	0	0	0	0	0	0
- information is outdated	1	0	0	0	0	0	0
- poor information integration with the customer	1	0	0	0	0	0	0
-customers receive defective products	0	1	0	0	0	0	0
- customers receive damaged products	0	1	0	0	0	0	0
- the wrong product is shipped to the customer	0	1	0	0	0	0	0
- the customer regrets purchasing the product	0	0	1	0	0	0	0
- customers make mistakes when placing online orders	0	0	1	0	0	0	0
- customers purchase too many products	0	0	1	0	0	0	0
- customers purchase impulsively and change their mind after buying the product	0	0	1	0	0	0	0
- very high return rates during holiday periods	0	0	1	0	0	0	0
- Wardrobing	0	0	0	1	0	0	0
- Bracketing	0	0	0	1	0	0	0
- purchases made with stolen credit cards	0	0	0	1	0	0	0
- purchasing a product in order to replace it with a damaged or old one	0	0	0	1	0	0	0
- the customer claims never to have received the ordered goods	0	0	0	1	0	0	0
- high reverse logistics costs affecting profitability	0	0	0	0	1	0	0
- the unpredictable nature of online returns	0	0	0	0	1	0	0
- long cycle times	0	0	0	0	1	0	0
- the products are delivered late to the customer	0	0	0	0	1	0	0
-competitors' actions involving more permissive return policies	0	0	0	0	0	1	0
- top management in many companies does not devote sufficient effort	0	0	0	0	0	0	1
- there is a lack of an adequate organisational structure for handling returns	0	0	0	0	0	0	1
- lack of coordination with 3PL, insufficient integration among departments	0	0	0	0	0	0	1

Tab.13 F_2 matrix