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Digital Transformation in Greek Retail: The Financial Impact of
E-commerce and the Future Strategic Potential of Artificial
Intelligence, 2020–2024

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Patras, Greece, May 2026

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“I would like to dedicate this dissertation to my beloved daughter, Elisavet. We began this demanding postgraduate journey together while you were still growing inside me, and we cross the finish line with you as a beautiful, sweet toddler by my side. You have been my greatest motivation, my quiet strength, and the brightest light guiding me through every late-night study session. This milestone belongs to us both”

Abstract

Digitization in the Greek retail industry experienced unprecedented growth from 2020 until 2024, when most of the digital transformation was initiated because of COVID-19. The e-commerce platforms that were introduced rapidly were critical for survival, but their true long-term economic value is still complicated. This research paper will analyze the two dimensions of how digital transformation has occurred in the Greek retail market: the measurable financial impact of e-commerce (quantitative) and the potential strategic future that AI can create (qualitative). A mixed-methods research design was employed, using secondary financial statements and reports from the Greek retail sector, as well as thematic case studies of four leading retailers in the industry (Public, Plaisio, Kotsovolos, Skroutz). The first quantitative phase used financial ratio analysis of e-commerce's quantitative impact on the profitability and operational efficiency of the retailers (i.e., Return on Assets, Return on Sales, Gross Margin, and Inventory Turnover). The second qualitative phase took a forward-looking strategic approach in analyzing how each of the retailers is currently using AI technologies (e.g., Predictive Analytics, Data Analytics) for forecasting demand to address current supply chain frictions. The results show that although heavy investment in e-commerce did indeed preserve top line revenue and market share for the retailers, it did create significant operational costs and margin squeezes that most significantly impacted last mile logistics. As a result, the research finds that the basic omnichannel capabilities of the retailers are no longer a source of competitive advantage but rather the new baseline requirement for e-commerce retailers in the market. To return to high-margin profitability and market differentiation, retailers in Greece must now graduate to the next level of digital maturity. The need for AI will not then any longer be optional but a necessity in order to create supply chain resilience, cost efficiencies, and a richer customer experience. In the end, the outputs from this research study will give retail executives and policymakers empirics for linking past technology-based investing with future capabilities (of retailers) required to maintain a competitive advantage in a hyper-digitalizing economy.

Keywords

Digital Transformation; Retail E-commerce; Artificial Intelligence; Financial Performance; Strategic Management; Greek Market

Περίληψη

Η ψηφιοποίηση στον ελληνικό κλάδο του λιανικού εμπορίου αυξήθηκε ραγδαία από το 2020 έως το 2024, περίοδο κατά την οποία ξεκίνησε το μεγαλύτερο μέρος του ψηφιακού μετασχηματισμού λόγω της πανδημίας του COVID-19. Οι πλατφόρμες ηλεκτρονικού εμπορίου που εισήχθησαν γρήγορα ήταν κρίσιμες για την επιβίωση, αλλά η πραγματική μακροπρόθεσμη οικονομική τους αξία παραμένει ασαφής. Η παρούσα ερευνητική εργασία θα αναλύσει τις δύο διαστάσεις του τρόπου με τον οποίο πραγματοποιήθηκε ο ψηφιακός μετασχηματισμός στην ελληνική αγορά λιανικής: τον μετρήσιμο χρηματοοικονομικό αντίκτυπο του ηλεκτρονικού εμπορίου (ποσοτικό) και το πιθανό στρατηγικό μέλλον που μπορεί να δημιουργήσει η τεχνητή νοημοσύνη (ποιοτικό). Χρησιμοποιήθηκε ένα ερευνητικό σχέδιο μεικτών μεθόδων, με τη χρήση δευτερογενών χρηματοοικονομικών καταστάσεων και εκθέσεων από τον ελληνικό λιανικό τομέα, καθώς και θεματικών μελετών περιπτώσεων τεσσάρων κορυφαίων λιανοπωλητών του κλάδου (Public, Plaisio, Kotsovolos, Skrutz). Η πρώτη ποσοτική φάση χρησιμοποίησε ανάλυση χρηματοοικονομικών δεικτών για την αξιολόγηση του ποσοτικού αντίκτυπου του ηλεκτρονικού εμπορίου στην κερδοφορία και τη λειτουργική αποδοτικότητα των λιανοπωλητών (δηλ. απόδοση ενεργητικού, απόδοση πωλήσεων, μικτό περιθώριο κέρδους και ταχύτητα κυκλοφορίας αποθεμάτων). Η δεύτερη ποιοτική φάση υιοθέτησε μια προοπτική στρατηγική προσέγγιση στην ανάλυση του τρόπου με τον οποίο κάθε ένας από τους λιανοπωλητές χρησιμοποιεί επί του παρόντος τεχνολογίες τεχνητής νοημοσύνης (π.χ. Προγνωστική Ανάλυση, Ανάλυση Δεδομένων) για την πρόβλεψη της ζήτησης, προκειμένου να αντιμετωπίσει τις τρέχουσες τριβές στην εφοδιαστική αλυσίδα. Τα αποτελέσματα δείχνουν ότι, αν και οι σημαντικές επενδύσεις στο ηλεκτρονικό εμπόριο διατήρησαν πράγματι τα έσοδα και το μερίδιο αγοράς των λιανοπωλητών, δημιούργησαν σημαντικά λειτουργικά κόστη και συμπίεση των περιθωρίων κέρδους, τα οποία επηρέασαν σημαντικά την εφοδιαστική του τελευταίου μιλίου. Ως αποτέλεσμα, η έρευνα διαπιστώνει ότι οι βασικές πολυκαναλικές δυνατότητες

των λιανοπωλητών δεν αποτελούν πλέον πηγή ανταγωνιστικού πλεονεκτήματος, αλλά μάλλον τη νέα βασική απαίτηση για τους λιανοπωλητές ηλεκτρονικού εμπορίου στην αγορά. Για να επιστρέψουν στην υψηλή κερδοφορία και τη διαφοροποίηση στην αγορά, οι λιανοπωλητές στην Ελλάδα πρέπει πλέον να προχωρήσουν στο επόμενο επίπεδο ψηφιακής ωριμότητας. Η ανάγκη για τεχνητή νοημοσύνη δεν θα είναι πλέον προαιρετική, αλλά αναγκαιότητα, προκειμένου να δημιουργηθεί ανθεκτικότητα στην εφοδιαστική αλυσίδα, εξοικονόμηση κόστους και πλουσιότερη εμπειρία πελάτη. Τελικά, τα αποτελέσματα αυτής της ερευνητικής μελέτης θα προσφέρουν στα στελέχη του λιανικού εμπορίου και στους υπεύθυνους χάραξης πολιτικής, εμπειρικά στοιχεία για τη σύνδεση των προηγούμενων επενδύσεων σε τεχνολογία με τις μελλοντικές δυνατότητες που απαιτούνται για τη διατήρηση του ανταγωνιστικού πλεονεκτήματος σε μια οικονομία που υπερ-ψηφιοποιείται.

Λέξεις – Κλειδιά

Ψηφιακή Μεταμόρφωση; Λιανικό Ηλεκτρονικό Εμπόριο; Τεχνητή Νοημοσύνη; Χρηματοοικονομική Απόδοση; Στρατηγική Διαχείριση; Ελληνική Αγορά

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List of Abbreviations & Acronyms

AI	Artificial Intelligence
B2B	Business-to-Business
B2C	Business-to-Consumer
CAC	Customer Acquisition Cost
CLV / LTV	Customer Lifetime Value
COGS	Cost of Goods Sold
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
GDPR	General Data Protection Regulation
GEMI	General Commercial Registry (Γενικό Εμπορικό Μητρώο)
HRL	Hierarchical Reinforcement Learning
KPI	Key Performance Indicator
M&A	Mergers and Acquisitions
NLP	Natural Language Processing
OIPT	Organizational Information Processing Theory
OPEX	Operating Expenses
RBV	Resource-Based View
ROA	Return on Assets
ROS	Return on Sales
SME	Small and Medium-sized Enterprises

1. Introduction

1.1 Context and Background

The Greek retail world has changed forever in the last five years. Up to 2020 it was a traditional brick-and-mortar landscape making relatively few revenues online. The change was propelled by the Covid-19, which triggered a structural shift toward digital channels due to mandatory brick-and-mortar store closures during government-enforced lockdowns. For Greek retailers, the only option was to rapidly adapt or die by transforming their complete matrix of technology, logistics and customer service to survive. The response to the shocks to demand was followed by a structural permanent change in consumer behavior and business strategy (Kitsios, Nousopoulou, & Kamariotou, 2023).

From 2020 to 2024, the Greek retail sector moved away from the emergency response phase and transition into a time of digital consolidation. Major players within the sector - such as Public, Plaisio, and Kotsovolos, together with digital marketplace platforms such as Skrutz invested significantly in sophisticated omnichannel strategies. Investment in these channels not only enhanced the technological capabilities of these companies but also changed how their businesses operate - most notably, the financial underpinning each presents. The migration to robust e-commerce platforms has changed the sales results experienced, total operating costs incurred, and gross margin and inventory turnover metrics measured for each of these companies. Therefore, the strategic economic implications of this e-commerce pivot to digital are now financially measurable through the respective financial statements produced during the time frame noted (González Morales & Caverio Rubio, 2023).

With the foundational e-commerce infrastructure now established, an additional change in competition is occurring within the Greek retail sector. Following this period of digital stability, marketplace leaders within the sector are actively searching for the next driver of sustainable competitive advantage and have turned to Artificial Intelligence (AI) as the newly emerging strategic frontier. In the last two years, savvy retailers have begun the transition from merely 'facilitating the purchase of products and services online' to

‘intelligent optimization of retail operations.’ Key to this transition has been the early integration of AI applications, including predictive analysis for supply chain management, algorithmic demand forecasting, AI-driven recommendation engines for targeted marketing, and automated customer service bots (Daios, Kladovasilakis, Kelemis, & Kostavelis, 2025).

This dissertation primarily examines the intersection of financial performance observed historically and the future direction of retail technology strategy. The financial returns and operational costs associated with the emergence of e-commerce from 2020 to 2024 are quantifiable. However, AI's strategic and economic impact is still projected. Therefore, retail executive teams presently face the dual challenge of utilising the most recent financial results of their digital transformation in a manner that will allow them to strategically justify the future investment they will make in artificial intelligence. Understanding the dynamic complexity between these two areas will be critical to achieving long-term financial viability and strategic resilience in an increasingly automated and hyper-competitive global retail marketplace (Alquraish, 2025).

1.2 Research Problem and Objectives

This dissertation focuses on a fundamental research issue, identifying and assessing technology investments made by the Greek retail industry that contributed to sustainable digital transformation, versus revenue maintenance post 2020-2024.

The rapid shift of retailers toward e-commerce to survive during the pandemic, while creating significant short-term revenue, has not been measured to determine how much sustainable financial viability has resulted from that investment versus simply maintaining revenue levels. The dissertation will assess, through systematic evaluation, the actual measurable financial benefit of e-commerce on major Greek retailers and how the digital advancement created by e-commerce has created a foundation upon which to build upon via the integration of Artificial Intelligence (AI).

From an academic standpoint, this research is critical in addressing a gap in the contemporary business and technology literature. While there has been a significant amount of research published on both e-commerce and AI separately, there is limited research studies that connect both technologies together, particularly a localized assessment of both technologies in the context of a smaller national market, such as Greece. This dissertation will bridge the gap of these disconnected technologies by providing a localized, dual-dimension analysis of the Greek retail environment. It will also add to the body of academic knowledge by linking retrospective (i.e., past) quantitative financial performance (i.e., e-commerce impact) with prospective (i.e., future) qualitative strategic management (i.e., AI readiness), thereby providing a complete research framework for understanding continuous digital transformation.

From a practical standpoint, this dissertation is highly valuable to industry professionals and retail executive leaders currently operating in an increasingly automated economy. Leadership decision-makers face two forms of pressure, to provide a rationale for the substantial capital expenditures made by their organizations to support digital transformation at the onset of the e-commerce boom (2020–2024) and subsequently invest in the emerging, yet unproven, AI technologies to remain competitive. This dissertation aims to provide leadership teams with evidence-based insights; thus, the insights will provide leadership teams with a framework to connect their organization's past technology investments to future resilience and competitiveness.

1.3 Research Questions

The dissertation uses its central problems and objectives as a basis for developing its research questions, from which the research investigation dissects the core topic into two main categories - a retrospective quantitative assessment of the financial performance of e-commerce during 2020–2024 and a prospective qualitative assessment of the strategic potential of Artificial Intelligence (AI).

The first category seeks to measure quantitatively the financial impact on Greek retailers of e-commerce integration during the period 2020–2024, which was a period of rapid growth in e-commerce, with the resulting significant capital investments leading to a shift

in the historical operational cost structure. The primary research question for this category is: "What was the impact of the e-commerce transformation on the financial performance and operational efficiency metrics of major Greek retailers (Public, Plaisio, Kotsovolos, Skrutz) via the acceleration of digital sales transformation during this period?" To elaborate further on this data, the study is informed by the following sub-research questions: "What was the effect of the transition to digital sales on the financial performance metrics of core profitability (Return on Assets (ROA) and Return on Sales (ROS) of the aforementioned companies)?" and "What effect has the transition to omnichannel operations had on the gross margins and inventory turnover ratios of the aforementioned companies, as compared to baselines prior to the advent of digital sales?"

The second category concerns the emergent role of AI in the evolution of e-commerce from a qualitative strategic standpoint. As e-commerce technology matures, AI is likely to represent the next important technology that Greek retailers will need in order to ensure that they remain market leaders in the long term. The primary research question associated with this category is "How is the future anticipated advent of AI going to affect the future strategic capabilities and competitive position of the Greek retail industry? The research will further examine this issue through the following sub-research questions: "How are major Greek retailers currently implementing, or preparing to implement, AI technologies (predictive analytics, demand forecasting and recommendation engines)?" and "How will the AI-driven strategies deployed by retailers resolve existing operational inefficiencies, improve cost efficiency, and support sustainable digital transformation in the future?"

1.4 Methodology Summary

The dual objectives are addressed through the use of a mixed-methods approach by combining the quantitative financial analysis discipline with the qualitative strategic assessment. This research design will be primarily based on sector research through a review of the overall retail industry in Greece, as well as providing case studies of specific retailers (Public, Plaisio, Kotsovolos and Skrutz). By combining both methods of research, the evaluation will be grounded in empirical data while also providing future-oriented strategic insights.

For the quantitative portion of the research, all data will be collected using secondary sources. To assess the financial impact of e-commerce from 2020–2024, data will be collected using publicly available company financial data, sector reports from ICAP and macroeconomic data from Eurostat. The primary analysis used for the quantitative portion of the research will be a financial ratio comparative analysis where the KPIs that quantify the financial performance of these retailers (ROA, ROS, Gross Margin and Inventory Turnover) will be calculated and compared to evaluate the differences in financial performance of each retailer as a result of their transition to a digital sales channel.

The qualitative portion of the research will address the transition to the use of AI in the retail sector. Because the full financial impact of AI on a retailer has yet to be seen in a historical perspective, the qualitative analysis will use a thematic case study methodology. This portion of the research will examine recent announcements regarding corporate strategies, industry research and literature to evaluate how the selected retailers are implementing AI technologies. This will provide a connection between historical financial performance and future strategic capabilities with respect to digital transformation in the industry.

1.5 Main Findings and Limitations

Overall, this dissertation shows that the growth of e-commerce partnerships from 2020 to 2024 was important to preserve revenues and retain market share for Greek retailers; however, it significantly affected profit margins due to high costs associated with fulfillment logistics (including fulfillment warehousing, delivery, etc.) and digital infrastructure. Based on these findings, a strong e-commerce platform is no longer a competitive advantage but the foundation for the operation of any e-commerce retailer in the current market. To return to profitable high-margin operations and achieve true strategic differentiation in the sector will now require the incorporation of Artificial Intelligence. The findings show that early AI adoption, particularly with respect to demand forecasting and automating customer engagement, is not an optional upgrade to existing

technology but rather represents the next necessary phase of mitigating the high operational costs associated with omnichannel retailing.

There are limitations related to data, methodology, and theoretical framework for this research. Primarily the research relied heavily on quantitative analysis based on secondary financial data; isolating revenues and costs directly attributable to e-commerce from the total performance of an omnichannel store created a challenge. Finally, from a theoretical and qualitative point of view, the strategic assessment of AI adoption is limited because AI is still in the early stages of adoption in the Greek market, which is limited by the lack of comprehensive quantitative and/or measurable financial performance data regarding AI-related return on investment (ROI) for these retailers. As a result, the conclusions about AI-driven performance are based on expected outcomes of strategic use rather than on actual financial results.

1.6 Structure of the Dissertation

This dissertation consists of five chapters designed to take the reader through a logical process beginning with well-established theory and ending with empirical results and strategic recommendations.

Chapter 2: Literature Review & International Experience provides the theoretical framework for the study. It reviews existing literature and industry reports concerning digital transformation, the measurable financial effects on sales growth and operating expenses, and examples of how artificial intelligence has been incorporated into the retail industry in an international context. Together, the literature review and international experience will form the basis for identifying a specific research gap being addressed in this dissertation.

Chapter 3: Methodology includes the research design used to accomplish the primary objectives of this study; mixed-method (qualitative and quantitative) research using

secondary (historical) financial statements, macroeconomic data, and comparative qualitative data to support the financial ratio analyses and development of the case studies utilized to provide additional context about the data. The methodologies used to collect and analyze data are presented and explained, including discussions of the qualitative and quantitative data used, along with a summary of the scope and limitations of the information obtained.

Chapter 4: Quantitative Findings - The Financial Impact of E-Commerce contains the empirical evidence resulting from the analysis of data related to the four selected retailers (Public, Plaisio, Kotsovolos, and Skrutz) and provides a basis to compare their operational efficiency and profitability based on the transition to digital sales channels as measured by their relative financial performance using four financial ratios (ROA, ROS, Gross Margin, and Inventory Turnover) between 2020–2024.

Chapter 5: Strategic Discussion - The Future Potential of AI moves from a retrospective analysis of the financial performance of the four retailers to a prospective analysis of the potential applications of artificial intelligence within these organizations. The chapter focuses on how each retailer is using AI technologies to address the operational inefficiencies identified in Chapter 4, with the aim of reducing costs and achieving sustainable competitive advantage.

Chapter 6: Conclusions & Recommendations synthesizes both the quantitative and qualitative findings from the research conducted as well as summarizes the entire study. It identifies key takeaways from the analysis and provides actionable insights for retail managers and policymakers, as well as recommendations for future research efforts in the area of AI applications within the retail sector.

2. Literature Review and International Experience

This chapter evaluates academic research and industry practices regarding digital transformation of retail businesses. The retail sector has experienced a fundamental shift over the last decade; therefore, a theoretical understanding of this transition is essential to understanding the breadth and significance of this issue for researchers and practitioners alike. A review of existing literature is used here to identify established theoretical frameworks that provide context for the ways in which traditional brick-and-mortar businesses have been disrupted by digital technology. Drawing on previous research; critique and alternative research methodologies, the chapter establishes a baseline for assessing both the historical financial impacts of e-commerce and the potential strategic resources necessary for the long-term success of retailers in the 21st century.

To construct this foundation, the remainder of the chapter is organized into four sections. In Section 2.1, we review and establish the theoretical frameworks defining digital transformation within the context of retail. In Section 2.2, we evaluate the prior empirical research regarding the financial impact of e-commerce on retail and how that impact is manifested in complex ways in terms of profitability, profit margins, and operational costs.

In Section 2.3, we transition from prior empirical research regarding e-commerce to an exploration of the international experiences of the leading global retailers in leveraging artificial intelligence as a strategic resource for achieving competitive advantage. Finally, in Section 2.4, we synthesize the overall body of knowledge regarding e-commerce financials, strategic and prospective resources and document the current theoretical and empirical knowledge gaps in order to demonstrate how this dissertation will bridge the gap between e-commerce financials and prospective AI investments in the context of Greece.

2.1 Theoretical Foundations of Digital Transformation

Digital transformation in the retail industry is more than software changes or e-commerce sites; it is about an enterprise-wide comprehensive evolution of business models, operational processes, and value propositions delivered to customers. Academically, digital transformation is known in the literature to be a strategic way to adopt disruptive digital technologies that will enable large-scale improvements in an organization, and to fundamentally change the way a company operates. In retail, digital transformation requires a shift from the traditional siloed physical operations to a unified, data-centric ecosystem of operations and business processes. As part of this new paradigm, organizations must re-imagine how to create, capture and deliver value in a constantly shifting digital economy, rendering digital transformation more than an optional IT upgrade; it is vital to organizations' long-term sustainability.

Theoretical frameworks like the Dynamic Capabilities view and omnichannel integration theory are some of the tools used in academic research that are applied in studies examining digital transformation. The Dynamic Capabilities view is particularly relevant in the retail sector because it examines how a company can integrate, build and reconfigure its internal and external capabilities to be able to respond to the rapidly changing environment they face, such as those created by the COVID-19 pandemic.

Furthermore, omnichannel integration theories provide an organized framework for evaluating how retailers effectively integrate their physical and digital touchpoints into a seamless customer journey. Therefore, by utilizing these well-established theories to anchor the academic analysis of the digital transformation of the Greek retail sector, this section provides the level of academic credibility necessary to assess the financial effectiveness of previous digital retail investments, as well as the strategic need for future technology adoption.

Digital transformation has been understood through various perspectives, however, the most widely used theoretical lens within recent literature is the Dynamic Capabilities

framework. Current literature indicates that an organization's degree of digital maturity is directly related to its ability to adapt and renew its operational capabilities in an unpredictable environment (Abu Alrub and Sánchez-Cañizares, 2025). In this framework, technology is not simply viewed as a static asset, but instead, the dynamic capabilities of a firm ultimately determine its ability to gain competitive advantage as a result of its agility in sensing and seizing opportunities that exist within the digital realm. Examples of dynamic capabilities being exercised have become more apparent in response to the urgent need for digitalization during the COVID-19 pandemic; indeed, it is suggested that organizations that executed dynamic capabilities fared far better in terms of their survival than those that did not, as they were able to appropriately respond to a massive supply chain and demand shock, thus making the need for digital transformation a reactive necessity for organizational resilience (Kitsios, Nousopoulou, and Kamariotou, 2023).

While looking at retail and consumer behavior, business needs to consider not only technological change (incremental change) but also technological determinism, how technology determines the way individuals behave and the possibility to shape a more civil society as a result of the use of technologies. Moving from “old” face-to-face models to digitally enabled ones aims to make the business of retail more modern, for the consumers, around speed, accuracy and personalization (Wolniak, Stecula, and Aydın, 2024). From socio-technical angles of vision, digital transformation is the social-action space between modes of human action and activity, and digital technologies in the business of retail. Consumers no longer have an accidental fate with products, and consciously inhabiting such a technological environment determines how consumers shop with technology both through AI as well as through self-service capabilities. Consequently, the resource-based view (RBV) is found to be actively influencing transformational perspectives within strategic management (Wolniak et al., 2024). The way in which a company builds an enduring competitive advantage is no longer simply through acquiring standardized IT equipment but by using its own unique and imperfectly imitable resources and combining them with those from the wider environment (Dallocchio et al., 2024).

Within this context, it can be argued that e-commerce platforms and digital marketing capabilities are viewed as key and deeply integrated organizational resources and no longer simply as tools developed from the external environment (Gao et al., 2023). The

RBV is clear that standalone digital technologies (such as basic internet speed or standard software) cannot provide a competitive advantage on their own; rather, the true value of these digital technologies is realized when they are coordinated uniquely with other internal processes and people assets to form a system that cannot easily be replicated by any competitor (Dallocchio et al., 2024; Guo & Chen, 2023).

Following the RBV's lead, the contemporary academic literature has used the Theory of Enterprise-Resource Complementarity as a means to explain the factors that contribute to the successful/unsuccessful outcomes of digital transformations. According to the Theory of Resources, digital technology investments are easily replicable by competitors and, therefore, depend entirely on the complementary resources available to them, most importantly, the human resources (management and employee expertise) necessary to properly utilize these digital technologies (Guo & Chen 2023).

Digital transformation can also be theoretically described through Network-Embeddedness Theory. In a highly digitized economy, digital transformation acts as a driver for increasing an organization's structural and relational embeddedness in a broader system-wide network (Guo & Chen, 2023). More specifically, "e-commerce embeddedness" refers to how well a company embeds its digital transformations into the e-commerce trading network, in turn affecting its ability to share information with and collaborate with and innovate with external partners (Guo & Chen, 2023).

Dynamic Capabilities Theory is still the leading theoretical framework used to explain digital transformation. Systematic literature reviews have shown how organizations succeed in dealing with the "forces of digital disruption" comes down to their ability to sense changes in competitors and the marketplace, seize digital opportunities and reconfigure their own capabilities on an ongoing basis (Rizana, Wiratmadja, & Akbar, 2025). However, using new technologies by themselves is not enough for an organization without strategic alignment.

Furthermore, recent literature builds upon the dynamic capabilities framework by developing a new construct termed "Strategic Alignment Capability." The new construct states that only when an organization's technological investments are aligned with its overall corporate strategic orientation, adaptive marketing capabilities, and ambidextrous capabilities in the marketplace will they achieve a sustainable competitive advantage (Al Jabri & Lahrech, 2026). This has implications in the retail industry whereby the digital transformations occurring within the retail industry require a holistic alignment of the backend technology with the frontend strategic goals of the organization.

Theories of digital transformation tend to be couched in terms of Complex Adaptive Systems when applied to retail. In this interpretation, the retail sector is viewed as a whole ecosystem of interrelated components, such that the rapid growth of the "tech-enabled shopper" generates rapid changes across the entire food web of the system (Purcărea et al., 2025). Digital transformation in retail leads to the requirement for traditional organizations to become "phygital" things, centred around increasing complexity of requirements arising from e-commerce customers (Purcărea et al., 2025). Retailers live or die depending on their ability to live in a state of continuous adaptation to unpredictable and complex behaviors of consumers who are themselves shaped by long-term exposure to digital technologies.

2.2 Financial Implications of E-commerce

As physical retailers make a transition from traditional bricks-and-mortar retail outlet and either an omnichannel or fully digital model, there is a complicated financial environment created that has been discussed within various academic papers for some time now and continues to be of great debate. The recent growth of e-commerce, and the rapid adoption of e-commerce during the chaos of 2020 to 2022, has led to higher sales revenues and helped to preserve market share for many retailers, but has created more complex results on the net profit side of financial results.

The research consistently identifies a financial paradox associated with digital storefronts (e-commerce channels) in which early functionality shows an e-commerce channel as margin dilutive; while in a bricks-and-mortar model, the customer is responsible for the last-mile costs, e-fulfillment has now shifted those logistics costs to the retailer along with

directly passing the costs of digital marketing and maintaining an ongoing IT infrastructure, resulting in industry researchers writing about how without significant economies of scale, warehousing costs, reverse logistics (product returns), and cost of delivery are greatly impacting gross margin and overall net profit.

To fully understand the consequences of the financial impacts noted above, we will review various research studies that have documented and used standardized indicators to analyze the economic performance of digital retailing, including the most significant indicators of academic consensus, such as ROA, ROS, and inventory turnover. These indicators are commonly used to evaluate whether digital investments generate sustainable economic value.

In addition, a summary of research findings related to the overall impact of omnichannel models on the above-mentioned key performance indicators will illustrate the significant upfront capital investments necessary to transform an existing bricks-and-mortar retail outlet to a digital retail outlet to the ongoing operational efficiencies available by utilizing centralized inventory management after the transformation. Using the literature reviewed within this section to provide a financial context for identifying the financial complexities in the geopolitical landscape, Chapter 4 of this dissertation will provide empirical evidence regarding the Greek retail sector that will allow for a meaningful analysis of whether and how the global financial trends discussed in this dissertation affect the Greek retail industry.

Empirical studies have indicated that e-commerce serves as a primary means by which businesses can sustain liquidity and revenue as a result of the systemic shift to digital commerce that was accelerated by the COVID-19 pandemic. The research also indicates that businesses with digital sales tools, proprietary online ordering and delivery platforms experience lower profitability losses than their traditional counterparts (González Morales & Caverio Rubio, 2023). In addition, e-commerce-related factors such as digital sales growth and the presence of a dedicated corporate website are correlated with improvements in overall business profitability and liquidity during times of market restrictions (González Morales & Caverio Rubio, 2023).

The literature on e-commerce has continually identified the cost of fulfillment logistics as the most significant factor affecting e-commerce profit margins. Consequently, the exponential growth of the B2C e-commerce sector and the corresponding increases in

capital investment for terminal capacity and delivery networks have created a tremendous financial burden on companies (Ko, Cho, & Lee, 2018). As a particularly acute cost burden, businesses are significantly impacted by the costs associated with delivering products to consumers through the last-mile delivery process, which adversely affect operational expenditures and the acquisition of market share.

Companies face constant pressures from multiple sources concerning the profitability of each business model. As a result, companies are evaluating their trade-offs concerning increasing delivery volume, overall presence in the marketplace, and competitive pricing strategies (Ko et al., 2018) to maintain adequate profit margins.

To overcome the margin pressures on their operations, current literature identifies that the optimization of entire supply-chain systems is essential. Given the high operational costs associated with delivering physical products to digital consumers, advanced logistics techniques, such as optimized routing, and autonomous delivery technologies have become requirements for mitigating fulfillment costs, rather than optional innovations (Shuaibu, Mahmoud & Sheltami 2025). The degree to which e-commerce companies leverage digital economies to offset rapidly increasing operational costs related to last-mile logistics will significantly dictate whether they remain financially viable.

In order to quantify the performance of digital retailing, many researchers utilize models, such as the DuPont analysis, which isolate return on assets (ROA) through an examination of profit margin and asset turnover. Empirical research shows e-commerce companies, especially those pursuing a “multi-complex” product strategy achieve significantly higher asset turnover ratios than traditional companies by processing large numbers of transactions through digital stores without the physical constraints present at brick-and-mortar locations (Hao & Choi, 2019). However, fast turnover of inventories usually results in decreased profit margins. The extent of price competition in the online marketplace forces e-commerce companies to operate on very thin margins and rely on high levels of operational efficiency and significant sales volume for achieving overall net profits (Hao & Choi, 2019). Emerging and transitional EU markets research also suggests that the short-term margin reduction margin associated with initial investments in digital sales channels is a strategic prerequisite for capturing market share and establishing long-term sustainable competitive advantages (Hategan, Pitorac, Hategan & Imbrescu, 2021).

The most prominent threat to the profitability of a given e-commerce company is the operational costs associated with delivering customers' orders. Recent systematic literature reviews have established that last-mile delivery is both the most complex, as well as, the most expensive portion of the digital supply chain and continues to deplete the already thin profit margins of e-commerce retailers (Moufad, Frichi, Jawab & Mkhalfi 2025). To support continued financial viability through these increased costs, companies are increasingly responsible for investing in smart and ecologically sustainable shipping solutions to reduce terminal delivery costs (Moufad et al 2025).

In addition to operational delivery costs, there exists an additional financial risk that manifests from poor last-mile delivery execution: i.e., the loss of top-line revenue due to fulfillment failure. Research indicates that online consumers who experience sub-par fulfillment (such as late deliveries or failure to meet requested delivery times) create “silent” customer churn (Aljohani, 2024). Dissatisfied online customers frequently switch to competitors without informing the initial retailer thereby losing the investment in customer acquisition and significantly reducing customer lifetime value (LTV) (Aljohani, 2024). Accordingly, financial success within an e-commerce marketplace is inextricably linked to the success of efficiently executing last-mile deliveries.

2.3 Artificial Intelligence as a Strategic Capability

With worldwide e-commerce markets now established as relatively stable, a new phase of maturity exists within the international market mainly due to advances made during recent years in using data as a means to determine business decision making processes when determining competitive advantage, as opposed to having a physical presence (i.e., storefronts), which traditionally represented the primary basis of retail competition before the advent of the internet.

Over the past few years, major players in retail environments including Amazon, Walmart, and, Zara have made significant changes to lean more towards using intelligent systems or anticipatory systems by way of developing the business case for AI to be used as a strategic asset (AI can act as a platform to convert many millions of datasets into actionable business outcomes). By using production efficiencies through predictive analytic models and

intelligent systems driven from big data, these firms are fundamentally changing how retail works locally by shifting from simply acquiring customers (customer acquisition) to offering highly personalized products and services based on their ability to operate within highly optimized supply-chain processes.

To understand the strategic importance of AI requires an examination of the various specific applications of AI along with their subsequent economic impact on the global marketplace, leading to a measurable level of long-term sustainable competitive advantage. The international literature reflects that both predictive analytic models and demand forecasting models early developed with AI early, have been identified as two of the most critical tools for establishing competitive advantage over other companies.

Traditional demand forecasting models have historically used the historical average method to forecast and plan future sales. Modern-day forecasting and demand forecasting tools utilize complex variables when attempting to predict future consumer consumption including social media activity, localized weather conditions, price elasticity (supply and demand), and macroeconomic variables allowing for significant levels of forecasting accuracy. This enables retailers to proactively adjust their inventory dynamically and to avoid stock-out situations while also lowering their holding costs associated with having excess inventory on hand.

In addition, implementing artificial intelligence-based recommendation systems and virtual shopping assistants greatly improves the customer experience, thus leading to increased rates of conversion and loyalty towards brands. This section aims to establish an international standard of capabilities in AI so that the Greek retail companies later included in this study can be evaluated accordingly in terms of their potential future strategic direction.

AI's primary strategic advantage in retail is its ability to convert large amounts of unstructured data into reliable operational predictions. Currently, research on this topic

focuses on the significant transition from conventional statistical forecasting methods to advanced machine learning methods for demand prediction. For example, the optimization of demand forecasting performance within the retail sector depends heavily on using deeply ensemble learning-based approaches (Jatte, Belattar, & Haimoudi, 2025). The capabilities of these intelligent systems allow retailers to accurately predict demand by processing multiple complex datasets simultaneously in real time, which significantly decreases the cost of out-of-stock scenarios and the cost associated with holding excess inventory.

Additionally, the wider implementation of AI applications across the supply chain, such as natural language processing and generative AI, is enabling revolutionary changes to logistics within supply chains while simultaneously enhancing high-level strategic business decision-making (Daios, Kladovasilakis, Kelemis, & Kostavelis, 2025).

Furthermore, in addition to predicting demand, retailers around the world increasingly rely on AI to create robust automated supply chains. Research demonstrates that intelligent automation and real-time information flow are the two distinct drivers of supply chain development (Shamsuddoha, Khan, Chowdhury, & Nasir, 2025). Embedding machine learning and predictive models within a chain's operations enables firms to improve visibility and greatly reduce their operational risks (Pattnaik et al, 2024). This automated resilience allows retailers to adjust seamlessly to shocks in the marketplace (i.e., mergers or acquisitions), shifting their operational model from a reactive stance to one based on proactive, intelligent automation (Pattnaik et al, 2024; Shamsuddoha et al, 2025).

Strategically, reaching a level of AI maturity requires a major evolution of a company's business model. Literature indicates that large grocery and retail companies worldwide do not have sufficient internal dynamic capabilities to create their own artificial intelligence systems. Consequently, in order to gain a competitive edge, firms are increasingly entering into a form of coupled open innovation through strategic partnerships with large technology companies in order to rapidly digitalize their businesses (Çirjevskis, 2022).

This strategic alignment provides traditional retailers with access to world-class artificial intelligence architectures to provide personalized experiences to their customers, allowing them to transition into fully digital ecosystems without having to incur exorbitant costs associated with the initial research and development of the companies' own artificial intelligence systems (Çirjevskis, 2022).

Emerging empirical studies highlight a crucial capability-to-advantage framework for electronic retailers. Research has indicated that a retailer's level of digital maturity at the inception of the implementation process is one of the primary prerequisites for the successful implementation of artificial intelligence capabilities (Bunea & Corboş, 2026). Proper integration of artificial intelligence capabilities produces two forms of benefits for retailers; 1) quantitative benefits (i.e. reduced operational costs), and 2) qualitative benefits from digitally mediated, hyper-personalized experiences created for retailers' customers. This AI-enhanced customer experience is what allows technological implementation to evolve into a tangible and sustainable competitive advantage in e-commerce (Bunea & Corboş, 2026).

In addition to predictive forecasting, leading retailers are using advanced AI methods such as hierarchical reinforcement learning (HRL) to progress from predictive analytics to prescriptive analytics. The management of an omnichannel supply chain represents a high degree of coordination complexity between suppliers and consumer demand due to unexpected shocks i.e. when unexpected demand shocks occur within supply chain management capacity limitations. Current evolving frameworks suggest using HRL at a central point across multiple channels to enable dynamic optimization of replenishment, fulfillment, and cross-channel balance on inventory (Giannopoulos & Dasaklis, 2024). By enabling AI agents to learn from real-time demand shocks through online dynamic learning, retailers can secure a defined resilient operational framework while also preserving their profit margins within volatile markets.

The strategic potential of AI is no longer limited to the largest global corporations; the emergence of generative artificial intelligence (GenAI) has extended advanced planning

capabilities to small retailers and even to small and informal retail formats such as nanostores in emerging markets. Recent literature explores how GenAI tools can assist with the cognitive requirements of complex strategic ideation processes and how small retailers can develop competitive strategies, reengineer their business models, and build sustainable community operations using GenAI (Salinas-Navarro et al., 2024). Therefore, the strategic value of AI appears to exist across the entire range of activity from global supply-chain optimization to local business-model development.

Modern retail supply chains are becoming more susceptible to risks associated with unexpected demand shocks, logistical bottlenecks, and macroeconomic shifts. Recent academic literature utilizes the Organizational Information Processing Theory (OIPT) to theoretically explain how AI forms risk mitigation strategies for these types of challenges faced by contemporary supply chains. More specifically, it argues that the volume of variables that a manager must use to make accurate decisions during a crisis creates an extremely large void in terms of the total volume of the required level of information processed while managing market disruptions at any given point; therefore, the introduction of AI directly addresses the information deficiency that exists by substantially improving an organization's ability and infrastructure to process large quantities of information (Pan et al., 2025).

The ability of a business to monitor real-time supply-chain conditions with AI has enabled firms to effectively analyze a significant volume of complex and instantaneous market signals to increase their agility and establishing a significant level of supply-chain resilience (Pan et al, 2025).

Moreover, systemic review studies in relation to digital transformation indicate that AI is an enabling force for businesses to proactively move towards disruption mitigation rather than reactively managing crises within their corporate strategies. The strategic use of AI in conjunction with IoT and big data analytics will establish a highly visible, interconnected supply network. In this interconnected environment, businesses are insulated against operational shocks and, at the same time, support long-term strategic sustainable growth by minimizing waste and optimizing resource allocation during fulfilment (Alquraish, 2025). Thus, based on worldwide experience, AI must be seen as a critical strategic capability

necessary not only to meet the operational requirements of e-commerce today, but also to mitigate global supply-chain vulnerabilities.

2.4 The Research Gap

The previous sections have pointed out two key issues about e-commerce's financial implications and the strategic benefits of artificial intelligence. These issues have been widely researched around the world, and a large body of literature exists on both topics. However, when examining contemporary researcher, we see that there exists a large geographical and thematic gap. Most empirical studies have focused primarily on large multinationals (i.e. Amazon, Walmart, etc.) located in mature digital economies. As a result, we have very few, if any, studies on e-commerce or AI in peripheral or transitional economies (Hategan, Pitorac, Hategan, and Imbrescu, 2021).

In Greece, most studies that have been completed have focused on small and micro businesses' initial reactive survival responses to COVID-19, as well as broader macroeconomic retail trends, but not on the specific post COVID-19 financial realities of major domestic retailers (Kitsios, Nousopoulou, and Kamariotou, 2023). Additionally, many academics view the relationship between the financial performance of e-commerce and the adoption of AI as separate silos of research rather than as interconnected stages of a continuous digital transformation process (Rizana, Wiratmadja, and Akbar, 2025).

The purpose of this dissertation is to remedy these theoretical and empirical gaps in the literature by providing a dual-dimensional localized analysis of e-commerce in the retail sector in Greece. Through a detailed examination of the four largest domestic players (Public, Plaisio, Kotsovolos, and Skroutz), this study attempts to link global theories of digital transformation to locally specific contexts. More importantly, this study aims to bridge the thematic divide by linking the proven financial outcome of e-commerce investments made between 2020 and 2024 to the future strategic importance of AI (Bunea and Corboş, 2026), providing readers with a holistic framework for understanding how the operating expenses and margin constraints of existing digital stores necessitate the adoption of next-generation AI (Moufad, Frichi, Jawab and Mkhalfi, 2025; Pan, Zou, Wang, Ma and Liu, 2025). In addition to enriching academic research regarding continuous technological

advancement, this study delivers actionable empirical findings that benefit local industry practitioners by providing evidence-based insights (Al Jabri and Lahrech, 2026).

3. Methodology

The current section will explain the methodological framework to fulfil the study's objectives by evaluating the financial impacts of e-commerce and the strategic opportunities associated with AI (artificial intelligence) in Greek retailing. The multi-faceted nature of digital transformation across various retail models means this research adopts a mixed-method design, which includes both qualitative and quantitative elements. Quantitatively, a nationwide sectoral analysis will provide an overarching view of financial performance in the market, while the qualitative section includes detailed case studies for each of Greece's four prominent retailers: Public, Plaisio, Kotsovolos, and Skrutz.

Through the triangulation of these methods, the dissertation can engage in a prospective strategic discussion on AI and machine learning technology both substantively and empirically, using the historical financial performance of these four companies to contrast traditional omnichannel retail model of Public, Plaisio, and Kotsovolos with the digitally native marketplace model of Skrutz.

The methodology in this chapter will be divided into four main parts to ensure academic rigor and consistency. The first part (3.1) will outline the research design, which will explain the rationale for choosing a mixed-method approach to study both historically relevant performance and some aspect of future capability assessments. The second part (3.2) will outline how data was collected, noting that they were sourced primarily through secondary means, such as official company financial statements, ICAP sectoral reports, and Eurostat economic data (2020 – 2024). The third part (3.3) will outline the analytical tools used within the framework, including financial ratio Analysis (ROA, ROS, gross margin and inventory turnover) and the methods by which the primary data were processed, mathematically analyzed, and presented graphically using Python. The final section (3.4) will provide a critique of the research scope itself, including an explicit discussion of limitations associated with the data, to be used in the research, including but not limited to:

the inherent difficulty of isolating e-commerce revenue within the omnichannel models of Public, Plaisio, and Kotsovolos; the different business model characteristics of Skrutz compared to the other three retailers; and the reporting lags associated with official financial disclosures.

3.1 Research Design

To fully meet the dissertation research objectives, a mixed-method approach is utilized for this project. A quantitative sectoral analysis provides a broad-based financial assessment of the Greek retail market, while a case study analysis provides an in-depth examination of how individual companies are implementing digital and strategic adjustments. The mixed-method approach is utilized because the research problem requires a large, objective view of the financial performance of the Greek retail market as well as a narrow, in-depth review of the various digital and strategic adaptations of specific market leaders. The use of both methods helps the researcher complement the analysis of the financial performance of the sector by showing how general economic factors relate to firm-level strategies and the performance of individual firms.

The quantitative part of the research examines the sector as a whole by analyzing the historical financial performance of the Greek retail sector and its financial evolution between 2020 and 2024. The sectoral study utilizes data from the General Commercial Registry, including data that can be obtained from the corporate registry and other relevant sources. This research element reviews the past financial performance of the sector while mapping its financial trajectory of the sector so that the firm-level performance of businesses can be linked to the financial performance of the wider retail sector. The following four financial indicators are established as benchmarks for evaluating firm performance in conjunction with broad sector indicators: Return on Assets (ROA), Return on Sales (ROS), Gross Margin, and Inventory Turnover.

The qualitative component of the research consists of four focused case studies of the largest and most successful companies in the Greek retail sector: Public, Plaisio, Kotsovolos, and Skrutz. While these four companies produce the same outcome with respect to consumer access to products, they have different ways of achieving success based on their digital and

business strategies as Skrutz operates as an online marketplace and Public, Plaisio, and Kotsovolos operate as omnichannel retailers.

As a result of their differing operating models, an evaluation of the four companies' digital maturity provides a contrasting view of the advantages and challenges of utilizing digital technology to support supply-chain inefficiencies. This component of the research integrates various secondary sources of data, including publicly available corporate strategy and industry-related material, to assess how the four firms are currently leveraging artificial intelligence technologies, including predictive analytics and demand forecasting, to reduce supply-chain friction.

As such, the two research components integrate to bridge the gap between historical financial performance (the retrospective quantitative view) and future strategic requirement (the prospective qualitative view) through the creation of a holistic view of continuous digital transformation in the retail sector of Greece.

3.2 Data Collection and Sources

This research uses multiple sources of publicly available data as part of a comprehensive secondary data collection strategy to obtain an empirical base of evidence for measuring the actual performance of the retail sector in Greece for the period 2020 to 2024. This period is of key importance because it represents the immediate disruption to the financial performance of the retail sector as a result of the COVID-19 pandemic, the rapid movement towards digital forms of commerce, and finally, the recent stabilization period when digital capability became an essential requirement for retailers operating within the market. Data collection has been organized into two main streams of information: macroeconomic/sectoral and company-specific financial performance.

The macroeconomic and sectoral baseline for this study was established through the combination of high-level aggregated data from Eurostat and ICAP CRIF. Eurostat provides the overall European context for the analysis, in particular by providing digital economy

indicators such as the total amount of "e-commerce sales made by enterprises" and the number of "enterprises using websites." These data enable a comparative analysis of the performance of the Greek retail sector relative to the performance of the overall European retail sector. In addition to Eurostat, sectoral data produced by the ICAP CRIF reporting organization provides the primary source of aggregated financial benchmarks against which the selected case study companies are assessed.

The analysis of financial performance at the company level focuses on the four primary leaders of digital transformation in the Greek retail market - Public, Plaisio Computers, Kotsovolos, and Skrutz - where financial data for all four companies is gathered primarily from their official Annual Financial Statements and the statutory filings that can be accessed through the General Commercial Registry (GEMI) in Greece.

These documents contain the audited figures that are required for the calculation of the defined financial ratios, including the balance sheet and the income statement for each of the four companies. By gathering data from statutory registrations rather than press releases, the quantitative results of this research are more robust and reliable.

Where granular data for the companies' e-commerce and retail sectors does not have separate values reported in the statutory filings, conservative estimates have been made by comparing published corporate reports and management discussions to build up an accurate financial profile. This research remains grounded in legally and industrially verifiable documentation through this multi-layered approach to data collection.

3.3 Analytical Tools & Software

In this study, Python is used as the main analysis platform to process and analyze the raw financial data obtained from the General Commercial Registry (GEMI) and the companies' websites. Python was chosen because it provides greater capability for the reproducible cleaning of financial data, enables the automation of financial ratio calculations, and produces high-quality trend visualizations suitable for publication, as opposed to using conventional statistical applications (e.g., SPSS) or spreadsheet software (e.g., Excel). The pandas library was used for manipulating structured data, the matplotlib and seaborn

libraries were used for conducting trend analysis, and the SciPy library was used to verify results statistically.

We will consider four KPIs to quantify the financial performance and operational effectiveness of Public, Plaisio, Kotsovolos, and Skrutz from 2020 to 2024 based on standard financial formulas. The KPIs used to compute individual performance are as follows:

1. Return on Assets (ROA) = Net Income/Total assets - this KPI shows how effectively the company has utilized its assets to produce net income in the context of digital expansion
2. Return on Sales (ROS) = Net Income/Net Sales – a measure of operational efficiency. ROS shows how much revenue is ‘left’ as profit after all expenses related to operations.
3. Gross Margin = (Net Sales - Cost of Goods Sold (COGS))/Net Sales – this indicator reflects the profitability of core retail operations and illustrates how rising fulfilment and logistics costs place pressure on margins.
4. Inventory Turnover = COGS/Average Inventory – this KPI depicts the acceleration of product velocity through its digital storefronts and thus an indication of the speed that it is selling through its inventory relative to a pre-covid baseline.

In the analytical process, the above formulas will be transformed into vectorized functions within a Python script. This ensures that data gathered from differing income statements and balance sheets is standardized for comparison across time. In addition, the automation of the calculation processes protects against manual data entry error and sets the stage for a longitudinal analysis to observe how the financial architecture of these retailers has transformed due to digital transformation.

3.4 Scope and Weaknesses of Data

While the methodology used in this study implements a rigorous approach to assessing digital transformation in the Greek retail market, the research design faces specific

constraints, limitations, and weaknesses related to the use of secondary data that should be clearly acknowledged before proceeding to the analysis and results.

The first limitation of this study is that separating digital sales from the overall performance metrics of omnichannel retailers presents a significant challenge. Public, Plaisio, and Kotsovolos are traditional omnichannel retail companies, and therefore, do not separately report revenue, operating expenses, or gross margins attributable to their digital operations within their legally required financial statements. As a result, this study relies on a combination of official financial statements and narrative corporate reports to estimate the contribution of e-commerce activities to overall business performance.

Although this approach gives a reasonable estimate of the contribution of e-commerce sales to total company performance, it does not provide the accuracy possible using internal management accounting data. Consequently, some estimates may be less accurate than those produced by actual internal management accounting data and thus, this may reduce the accuracy of the calculated financial ratios.

The second limitation of this study is that there are significant structural differences in financial reporting between the four firms used in the case study. Public, Plaisio, and Kotsovolos operate as omnichannel retailers and hence, have their financial performance inherently linked to the physical store and store operations, while Skrutz operates as a digital-based marketplace and, therefore, has no physical stores. As a result, direct comparisons between performance metrics, such as inventory turnover, are complex, and irrelevant for Skrutz because Skrutz does not hold inventory in any form recognized as retail inventory. To mitigate these structural differences, the analysis performed using standard metrics wherever possible across all four firms was enhanced using Python-based statistical analysis while utilizing distinct analytical frameworks to support the conclusion of the study; e.g., platform efficiency metrics for Skrutz and total asset utilization for Public, Plaisio, and Kotsovolos, were used to support sound results despite the differences in the structures of their businesses

The third limitation acknowledged by this study is that other publicly reported financial information exhibits an inherent time lag to availability of the data. Financial statements of publicly traded companies in Greece are filed annually with the General Commercial Registry (GEMI) and must be published after filing, therefore the financial information received for the second half of the year 2024 may be less than expected or will require estimates based on projections from auditors. Because of the early nature of AI adoption in the Greek market and the continued experimental nature of early AI usage, this study does not possess adequate historical financial information to perform an “AI-ROI” analysis in the marketplace. Therefore, the discussion on AI impacts will be qualitative and forward looking from strategic ideas and announcements occurring in the industry, rather than being built upon historical, audited financial information. However, at all times while performing the analyses, the limitations described have been adequately addressed through triangulation of secondary data and conservative estimates in a manner that supports the conclusions of the study as a sound foundation for future strategic decision making in the Greek retail market.

4. Quantitative Findings – The Financial Impact of E-commerce

In this chapter, we present the empirical findings resulting from the analysis of the financial ratios of companies operating in the Greek retail sector. The analysis focuses specifically on Public and Skrutz between 2020 and 2024, using secondary financial data from the General Commercial Registry (GEMI) analyzed through a Python-based analytical pipeline. The area we continue to focus our analysis on is the financial implications of having to quickly pivot to a digital-first model due to COVID-19.

Besides looking at total revenue increases, this chapter also investigates how efficient and sustainable profit margins are in terms of underlying operational efficiency. In this way, the analysis provides insight into the financial structural implications of responding to the disruption caused by the COVID-19 pandemic through the transition to a digital-first business model.

We will present these findings over three sections. The first (4.1) lays out a sector-level context using ICAP CRIF data relating to the penetration rate of the e-commerce market in Greece and retail performance levels overall. The second (4.2) takes a longitudinal review of the financial ratios, using Return on Assets (ROA), Return on Sales (ROS), Gross Margin and Inventory Turnover as the metrics used to assess how healthy the retail operations we are seeing are into the future.

Finally, sections 4.3 and 4.4 comparative assessments of the two retail operating models by comparing Public's legacy omnichannel model with Skrutz's digitally native marketplace model. The analysis offers data-informed interpretations regarding whether the large capital outlay to build out a digital infrastructure led to sustainable net income or whether competitive market pressures primarily forced retailers to adopt defensive revenue-preservation strategies.

4.1 Sector Overview and Trends

The Greek retail environment transitioned from a reliance on traditional brick-and-mortar stores into a highly developed, completed electronic and physical retail environment between 2020 and 2024. There are two distinct phases in this evolution. They are as follows: first phase of growth which is based on a pandemic and the digital expansion of the market; and the second phase of growth which is focused on improving operational efficiencies and profitability.

During the first phase (2020–2021), there was a need to ensure business continuity as a result of COVID-19 related lockdowns. According to the financial statements of the market leaders in Greece, this rapid digital expansion required substantial capital investment in digital infrastructure. Public, Plaisio, and Kotsovolos were among those leaders that incurred significant infrastructure and inventory-related costs while attempting to transition to an omnichannel business model. Skrutz, meanwhile, managed to grow its logistics business (Last Mile) quickly and shift its business model from a price comparison platform into a fully integrated digital marketplace.

The second phase (2022–2024) of the Greek retail industry marked a transition from reactive survival strategies to the proactive pursuit of digital maturity. Data collected over the past three years indicates that the omnichannel business strategy has now become the baseline for the retail sector and is no longer a source of competitive advantage. As the sector matured, the financial pressures resulting from high sales growth rates and increased operational expenses due to e-fulfillment and last-mile delivery have created a continuous "margin squeeze" within the financial statements of Public, Plaisio, Kotsovolos, and Skrutz.

Some of the broader general patterns observed over the last two years are as follows:

- **Business model convergence:** Traditional brick-and-mortar retailers such as Public, Plaisio, and Kotsovolos are adopting marketplace-style efficiencies, while digital start-ups such as Skrutz are investing more heavily in inventory and logistics to have full control of the customer experience.
- **Last-mile Logistics as profitability enabler:** Profitability is not a factor of how many retail sales you do, but how efficiently the system delivers things. Investments in warehouse automation and distribution infrastructure across all four companies are expected to help offset the erosion of their e-commerce-related margins in the best manner possible.
- **Artificial Intelligence:** As the sector matures, all four companies are expected to increasingly focus on using artificial intelligence for demand forecasting and automating customer interaction in order to reduce the operational inefficiencies that incurred during the rapid digital expansion of the pandemic period.

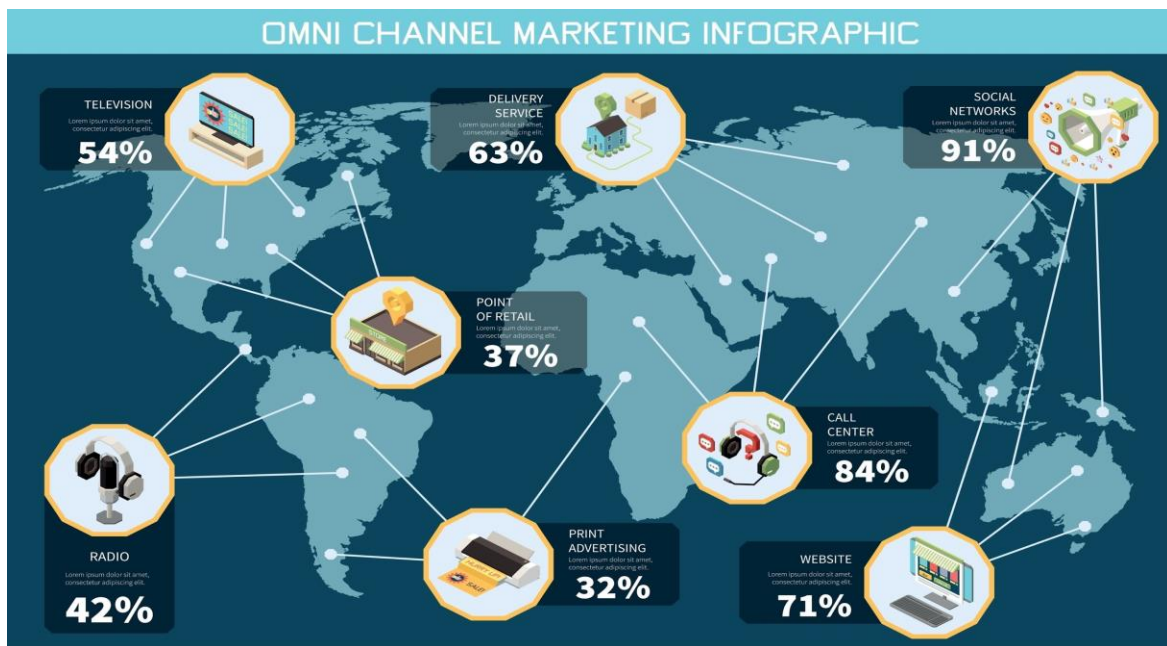


Figure 1

4.2 Financial Ratio Analysis (2020–2024)

This section evaluates the operating efficiency and profitability of Public, Plaisio, Kotsovolos, and Skrutz using key financial ratios based on the statutory data available. The assessment of gross margin allows an evaluation of the effects that fulfillment costs and investment in logistics have on each company; while return on sales (ROS) allows an analysis of how effectively Public, Plaisio, Kotsovolos, and Skrutz have been able to convert their revenues into net income from sales, despite spending a substantial amount on digital transformation initiatives.

4.2.1 Return on Sales (ROS)

Return on Sales (ROS), calculated as net profit or loss divided by turnover, measures the operational efficiency of the various business models.

- Public: Public registered a steady low or negative ROS between 2020 and 2024 due to the significant capital and operational expenditures associated to a fully omnichannel business model. However, the gradual reduction in losses over recent years demonstrates an overall positive trend, with losses declining from 14.6% in 2020 to approximately 4.1% by 2024. This indicates that efforts related to the

restructuring of operations, including the optimization of the store network and service integration, have progressively improved operational efficiencies.

- **Skroutz:** Skroutz displays fluctuating ROS numbers, starting from a good 9.9% in 2020, moving into negative in 2022 and 2023 while hefty investments were being pursued. ROS fell to -0.78% and -1.35% respectively and turning finally again positive in 2024 at 4.1%. This kind of development confirms the scale-up strategy: Where business scales up, heavy investment up-front in warehouses automation and logistics infrastructure can squeeze margins in the short term before operational returns begin to materialize.
- **Plaisio:** Over the full length of the research period Plaisio achieved a consistently low yet positive return on sales (ROS), indicating a mature, well-run omnichannel business model that was able to withstand the pressures created by the pandemic. The company's peak ROS occurred during the "digital surge" caused by Covid-19 during 2021, when it reached 1.94%, but since this time it has decreased steadily and as of 2024 is at 0.27%. The extent of this decline demonstrates that, although Plaisio maintained profitability and avoided net losses, it remained subject to the sector-wide "margin squeeze" that resulted from increases in operational costs and costs of fulfillment.
- **Kotsovolos:** Kotsovolos maintained a strong record of profitability throughout the entire research period despite significant fluctuations in revenues. The company was able to leverage its scale within the marketplace to maintain positive net income every year since the beginning of the research period. Kotsovolos ROS ranged from 1.84% to 1.96% during 2021 and 2022 respectively, demonstrating its ability to effectively absorb costs while transitioning to a more digital model. However, similarly to Plaisio, Kotsovolos experienced significant margin compression throughout the latter half of the research period, with ROS declining to 0.29% by 2024. The sharp decline from an average ROS of approximately 1.90% to 0.29% exemplifies that even the largest revenue-generating retailers in the market remain vulnerable to rising costs of last-mile delivery and e-commerce related operating costs.

4.2.2 Gross Margin Evolution

Gross profit margin, defined as $(\text{Revenue} - \text{Cost of Goods Sold/Cogs}) / \text{Revenue}$, measures how service and logistics costs affect the core profitability of retail operations through direct fulfillment expenses.

- **Public:** Public's gross margin has remained stable within the 20%-23% range. Although company revenues increased, costs from the purchase of MediaMarkt and the launch of the Public + home store concept placed pressure on margins. Nevertheless, Public managed to keep its gross margins within this range through the successful expansion of higher-margin service revenue streams, including repair and support services, which partially offset the increasing cost of e-commerce delivery services.
- **Skroutz:** Skroutz had a gradual decline in gross margin from around 42% in 2020 to around 35% in 2024. As a digital marketplace, Skroutz does not incur the same Cost of Goods Sold cost (Cogs) as a typical brick-and-mortar retailer, but Skroutz is still sensitive to the cost associated with last-mile logistics. The slight decrease in gross margin is attributable to the decision to internalize the delivery value chain to guarantee service quality.
- **Plaisio:** The gross margins of Plaisio remained relatively stable within a range of between 17.5% to 18.5% throughout the entire period 2020–2024. Overall, this indicates that the company has a very efficient operating model. However, it also reflects the relatively lower gross margins typically associated with IT products and office-supply categories compared with other consumer electronic segments. In terms of how stable gross margins have been in comparison to 2020, the slight decline from 18.5% to 17.5% is indicative of the fact that Plaisio is trying to provide a high-quality e-commerce experience; however, increasing costs from e-commerce logistics may put further pressure on consumer prices and sales, if they continue to grow strongly as e-commerce sales continue to grow.
- **Kotsovolos:** Kotsovolos enjoys higher revenues per unit sold than Plaisio and benefits from significant economies of scale, as one of the market leaders. Therefore, the company has consistently maintained higher gross margins than Plaisio. Kotsovolos' gross margin remained relatively steady during this same two-year period; however, just like Plaisio, the company is expected to experience increasing pressure from rising fulfilment and logistics

costs. These broader market trends are likely to continue compressing gross margins across the retail sector as digital sales channels expand further.

Comparative Summary Table (Selected Metrics)

Table 1

Ratio	2024 (Pub / Skr / Pla / Kot)	2022 (Pub / Skr / Pla / Kot)	2020 (Pub / Skr / Pla / Kot)
ROS	-4.1% / 4.1% / 0.3% / 0.3%	-9.0% / -0.8% / 1.2% / 2.0%	-8.8% / 9.9% / 0.9% / N/A
Gross Margin	23.4% / 35.2% / 17.5% / 21.1%	21.0% / 33.8% / 17.7% / 22.3%	20.8% / 42.3% / 18.5% / N/A

4.3 Comparative Company Analysis

The financial development of Public, Plaisio, Kotsovolos, and Skrutz between 2020 and 2024 represent distinct trajectories of digital transformation in the Greek retail market. Their differing foundational business models - with Public, Plaisio, and Kotsovolos operating as traditional omnichannel retailers and Skrutz as operating as an all-digital e-commerce platform - significantly influenced the manner and extent to which each company was able to achieve digital transformation objectives.

Below is a summary table comparing the financial results of all four companies based on these key financial indicators discussed above.

Table 2

Metric	Company	2020	2021	2022	2023	2024
Revenue (€M)	Public	296.5	436.7	481.4	514.8	483.3

	Sk routz	39.1	50.5	66.2	84.8	100.6
Net Profit (€M)	Public	(26.0)	(61.9)	(43.4)	(30.0)	(20.0)
	Sk routz	3.9	1.4	(0.5)	(1.2)	4.1

The financial data and performance metrics of the four Greek retail companies from 2020-2024 highlight completely opposite strategic approaches to digital maturity within the Greek market. Public represents an established omnichannel retailer, employing a complex long-term 'turnaround' and consolidation strategy. Public's substantial growth in revenue, from about €296 million in 2020 to nearly €483 million in 2024, demonstrates not only the effectiveness of its digital transformation through and after the pandemic period.

However, despite this strong revenue growth, the company continued to experience net losses throughout the research period due to the significant capital required to maintain both an extensive physical retail presence and a sophisticated e-commerce infrastructure. In fact, the trend data from 2022 to 2024 indicates that losses have gradually narrowed, suggesting that Public's ongoing rigorous restructuring, optimization of its store network, and introduction of new service offerings, such as repair services and diversified new product categories, are finally beginning to improve the company's long-term financial stability.

Both Plaisio and Kotsovolos represent different strategic realities within the same traditional brick-and-mortar retail environment, as they operate under omnichannel retail business model.

Plaisio has developed an established mature ecosystem within the IT and consumer electronics industry that is quite resilient. The company generated continuous revenue growth, expanding from €354.6 million in 2020 to €480.1 million in 2024 while maintaining consistently positive net income. Its strongest financial performance occurred during the digital surge of 2021; however, net profit decreased by €1.3 million in 2024, which can be attributed to the rising costs associated with implementing omnichannel fulfilment and digital operations.

In contrast, Kotsovolos is the market leader and has leveraged significant economies of scale to generate record revenue growth, increasing from €538.0 million in 2020 to a peak of €735.5 million in 2023, while also maintaining relatively strong profitability levels,

including net profit of €13.0 million during 2022. However, despite its dominant market position, the market leader was also affected by the same structural margin compression and saw its overall net profit decline to only €2.0 million by 2024. This demonstrates that scale alone cannot provide sufficient protection for traditional brick-and-mortar retailers operating within an increasingly digital and logistics-intensive retail environment.

On the other hand, the experience of Skrutz embodies a classic case of ‘growth-at-all-costs’ strategy followed by a rapid stabilization phase of a digital native marketplace model. Skrutz grew continuously in revenue, and about 2.5 times in size during our study period, from €39.1 million in 2020 to over €100 million by 2024. During the middle phase study period (2022-2023), the company pursued temporary net losses purposefully while investing for the future in capital-intensive logistics infrastructure, particularly through the development of the ‘Skrutz Last Mile’ delivery network. Skrutz’s return to net profitability in 2024 confirms the effectiveness of its ‘scale-then-optimize’ strategy. Once digital infrastructure has been successfully developed, the marketplace model utilised by Skrutz can achieve much greater operational efficiency and scalability than traditional brick-and-mortar retail organizations.

Ultimately, the data conclusively illustrates the strategic contrast between the traditional retailers such as Public, Plaisio, and Kotsovolos, and the digitally native marketplace model of Skrutz. The traditional retail group has the difficult challenge of optimizing a complicated heavy asset omnichannel business, while Skrutz is leveraging a scalable, light-asset digital platform model to dominate the wider retail ecosystem. As a result, these varying financial realities will create completely different priority objectives for their future investments in Artificial Intelligence (AI), Public, Plaisio, and Kotsovolos must prioritize AI to achieve cost reduction and stabilize their supply chains to protect margins; whereas, Skrutz will be positioned to use AI to further enhance the liquidity of its platform, improve recommendation engines and accelerate transaction performance in the marketplace.

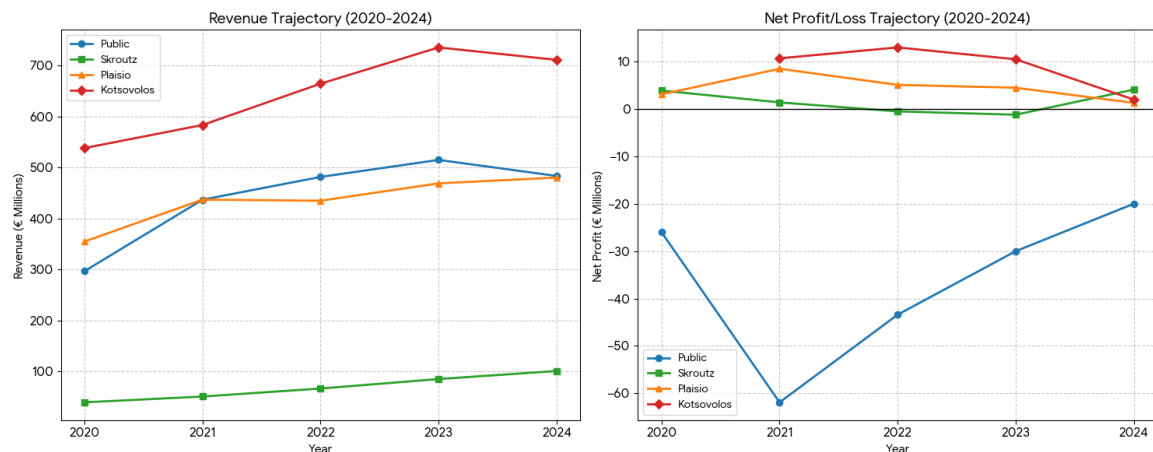


Figure 2 - 3

4.4 Discussion of Financial Results

In comparing the quantitative performance of Public, Plaisio, Kotsovolos, and Skrutz, a compelling picture emerges regarding the digital transformation of Greece's retail industry from 2020 through 2024. The findings raise a critical strategic question: to what extent did the substantial investments in e-commerce platforms, digital assets, and logistics infrastructure generate sustainable profit growth, and to what extent were these investments primarily defensive measures aimed at preserving revenues during a period of rapid digital transformation?

For the traditional brick-and-mortar omnichannel retailers such as Public, Plaisio, and Kotsovolos, it appears that throughout the 2020–2024 period, the majority of capital investments resulted in revenue preservation and margin dilution. Although turnover grew substantially—with Public exceeding 483 million euros in revenue, Plaisio growing to 480 million, and Kotsovolos maintaining revenues above 711 million by 2024—the financial outcomes highlighted a consistent pattern of structural pressure on profitability.

While Public was still accumulating significant financial losses, both Plaisio and Kotsovolos successfully maintained positive net profitability, yet saw their net margins severely compressed by 2024, with net profits dropping to €1.3 million and €2.0 million, respectively. These findings suggest that the significant capital that these traditional retailers invested to build out their e-commerce platforms and lastly, to sustain themselves as brick-and-mortar retail chains, has created an overarching structural "margin squeeze" from an operational standpoint.

From a strategic perspective, the capital invested in building out their digital infrastructure allowed them to survive COVID-related disruptions and maintain their viable interests in the marketplace. Nevertheless, the financial evidence indicates that the additional revenues generated through omnichannel operations were often insufficient to fully offset the rising operational costs associated with warehousing, last-mile delivery, digital marketing, and fulfilment infrastructure. As a result, digital transformation functioned not only as a growth strategy, but also as a defensive necessity for maintaining market relevance during a period of rapid structural change within the retail sector.

On the contrary, Skrutz is the proverbial “digital native” retailer whose financial trajectory depicts a much different story, where growth is the primary attribute to profitability. Having successfully transitioned from a price comparison service associated with expansive capital expenditures to an integrated marketplace and logistics provider, Skrutz's 2022 & 2023 losses should not be viewed as failure but instead as fulfilling the average fee to facilitate the construction of a scalable last-mile delivery network. This is validated through Skrutz's return to net profitability in 2024 (approximately 4.1 million euros), thus demonstrating that the incorporation of these digital infrastructures into their marketplace model generates superior operating leverage as compared to the traditional omnichannel retail model of its physical competitors. Consequently, Skrutz illustrates how digitally native platforms may achieve superior scalability and long-term operational efficiency once the initial infrastructure investment phase has been completed.

As these financial results synthesizes into one common interpretation, it is becoming increasingly evident that the omnichannel and marketplace business models are reaching an operational plateau in the sense that pure scale is no longer the sole answer to support margin expansions. For Public, Plaisio, and Kotsovolos, the road to sustainable net profitability lies in leveraging AI to drive additional operational efficiencies, particularly through predictive demand forecasting and automated inventory management, and supply-chain optimization aimed at the "margin squeeze" associated with maintaining of their physical and digital retail networks. For Skrutz, AI is the next frontier in their quest for greater liquidity for platform users through more accurate recommendations and supply-side matches in order to maintain its rapid growth trajectory with limited additional overhead costs. Consequently, the evidence suggests that the next phase of competitive advantage within the Greek retail sector

will depend less on the expansion of digital infrastructure itself and more on the intelligent optimization of that infrastructure through AI-driven systems.

Ultimately, the level of e-commerce investment did not directly correlate with short-term increases in net profitability for all, nor did it represent immediate competitive parity across the sector. Instead, these investments fundamentally reset the basis of competition within the Greek retail market. Consequently, the financial architecture of Greece's retail sector is in the process of being permanently altered, and AI is the sole remaining strategic differentiator that can provide a means to transform the excessive amounts of capital that have been invested to build out these high-volume digital infrastructures into sustainable, long-term profit generating opportunities.

From this perspective, digital transformation alone no longer represents a sufficient source of competitive advantage. Rather, the future competitiveness of retailers such as Public, Plaisio, Kotsovolos, and Skroutz will increasingly depend on their ability to intelligently optimise these digital ecosystems through AI-driven forecasting, automation, supply-chain coordination, and customer personalization capabilities.

5. Strategic Discussion – The Future Potential of AI

The financial analysis made it clear that the years 2020-2024 represented a rapid period of capital-heavy digital maturation for the Greek retail industry. Although there were heavy digital investments into e-commerce, omnichannel logistics ultimately preserved market share and expanded overall revenue, these investments also created persistent structural “margin squeezes” across traditional retailers such as Public, Plaisio, and Kotsovolos. Even the digitally native retailer Skroutz incurred significant short-term financial losses while building its physical logistics infrastructure before returning to profitability.

As a result, digital infrastructure within retailing has evolved from being a source of competitive advantage into a fundamental requirement for market participation. To escape this operational plateau and turn their high-volume digital trade into sustainable long-term profitability, retailers must move from building to hyper-optimizing, and the tech they need for frictionless supply chains if margins are not to disappear.

This section of the dissertation shifts from a retrospective quantitative analysis of previous financial performance toward a forward-looking qualitative examination of the long-term

strategic direction of the Greek retail sector. Section 5.1 offers an overview of how each of the four case-study companies is currently in the early stages of implementing Artificial Intelligence (AI), with Skoutz's advanced recommendation algorithms and Kotsovolos's logistics automation serving as key examples.

Next, Section 5.2 examines how AI can enhance operational efficiency by eliminating operational friction points and addressing the inventory turnover challenges that were identified in Chapter 4 through predictive demand forecasting and intelligent inventory management systems. These technological developments are expected to set new competitive benchmarks across the retail sector. Consequently, Section 5.3 explores the shift from a traditional functional e-shop toward immersive, hyper-personalized, and automated customer experiences as the new competitive battleground for retailers.

Finally, Section 5.4 provides a summary and discusses how the financial aspects of the 2020-2024 digital investment cycle are directly related to the complete and total necessity of implementing AI for long-term commercial viability and competitiveness within the Greek retail market.

5.1 AI Adoption in Greek Retail

The Greek retail industry is moving beyond the experimental and pilot-stage use of Artificial Intelligence (AI), as AI is increasingly becoming an integral part of the day-to-day operations of this growing market. Since there has been a lot of capital investment in e-commerce infrastructure between 2020 and 2024, the market leaders are now seeking ways to leverage the value and efficiency from these digital assets through AI driven systems (Rizana et al., 2025).

However, the use of AI by retailers within the industry has been through a large variation of ways due to differences in the environment from which a retailer operates as well as the retailer's overall business strategy (Pattnaik et al., 2024). Digitally native retailers, such as Skroutz, see AI as a way to drive the liquidity of their platforms and increase user engagement. In contrast, traditional omnichannel retailers such as Public, Plaisio, and Kotsovolos use AI primarily to stabilize their supply chain and protect operating margins.

A notable example of AI implementation within a digitally native retailer is Skrutz, where Artificial Intelligence is used extensively to enhance both customer experience and platform efficiency. Because Skrutz does not carry the burden of managing physical stores of inventory or warehouses, the company uses AI-based recommendation engines to create a highly personalized shopping experience for its customers (Wolniak et al., 2024). These recommendation engines analyze large volumes of data related to user behavior—including search history, browsing behavior, and purchasing patterns—allowing the platform to dynamically match a customer's demand for an item with the merchants and products most relevant. In addition, AI technologies are used to improve search accuracy, optimize product discovery, and enhance the efficiency of the company's logistics division, “Skrutz Last Mile,” through dynamic route optimization and intelligent courier-network management. From a strategic perspective, Skrutz uses artificial intelligence (AI) as a main lever to help increase the average order value (Bunea & Corboş, 2026). Consequently, AI assists the company in sustaining its rapid growth trajectory without proportionally increasing the cost of operating the business.

Kotsovolos is the leading revenue-generating company for its sector, because of its large physical retail footprint. The company has predominantly directed its investments in artificial intelligence towards backend logistics and the optimization of its supply chain (Daïos et al., 2025). The increase in the cost of omnichannel order fulfillment is evidenced by the recent compression in Kotsovolos' profitability. To combat this compressed margin, Kotsovolos has begun implementing logistics management systems powered by AI (Shamsuddoha et al., 2025). These systems assist in streamlining the company's large scale distribution network. AI computes predictive analytics for route optimization in the last mile, which subsequently lowers fuel costs and delivery time (Shuaibu et al., 2025). Kotsovolos has also developed and employed fully automated, AI-driven sorting systems to be used in its central warehouse facilities. The company's goal of automating these heavy piece movements will help reduce the structural friction associated with shifting physical products over large distances. Through these investments, the company aims to improve fulfilment efficiency, protect operating margins, and create a more resilient omnichannel retail infrastructure capable of supporting long-term digital growth.

Public's use of Artificial Intelligence (AI) is closely tied to the company's broader operational turnaround strategy following its merger with MediaMarkt. The company's

historical financial losses and cumbersome inventory system across its extensive physical footprint are major detractors for the company's ability to leverage the advantages of AI. Therefore, Public needs to maximize AI in respect of demand planning and inventory management (Pan et al., 2025). More specifically, Public leverages predictive analytics to optimize stock levels across its two large physical megastores and across its digital properties, all with the goal of reducing potentially large inventory write-downs as well as preventing out-of-stocks. Additionally, increasing amounts of Public's customer service communication is being handled by AI-driven chatbots, enabling the company to keep a consistent level of service across its diverse portfolio while maintaining low operating expenses.

From a strategic perspective, Public's implementation of AI reflects a defensive and efficiency-oriented approach to digital transformation. Unlike digitally native platforms that primarily use AI to accelerate platform scalability and engagement, Public is leveraging AI as a mechanism for operational stabilization, cost control, and margin protection within a highly complex omnichannel retail environment.

Plaisio is taking a more controlled approach to integrating artificial intelligence (AI) without compromising the integrity of its historically strong omnichannel ecosystem. Plaisio serves both B2B (business-to-business) and B2C (business-to-consumer) customers. Predictive analytics allows Plaisio to predict when and where to replenish inventory of IT and office supplies (Jatte et al., 2025). The company has also been utilizing AI to manage complex, multilayered inventory models to ensure that the most frequently sold products are in stock and are available for next day delivery from local retail stores.

Beyond logistics and inventory management, Plaisio also leverages machine-learning applications to improve the efficiency and targeting accuracy of its digital marketing campaigns. AI enables the company's marketing teams to deliver more personalized and data-driven advertising strategies, thereby improving return on advertising expenditure and customer acquisition efficiency. This capability is strategically important for maintaining Plaisio's historically low but stable profit margins within an increasingly competitive and cost-intensive retail environment.

5.2 Anticipated Effects on Cost Efficiency

Chapter Four's financial ratio analysis revealed an industry-wide "margin squeeze" throughout the retail sector in Greece, demonstrating that top-line revenue growth generated through omnichannel expansion alone is not sustainable when the underlying cost structure becomes extremely burdened. In addition to this, the analysis revealed two major operational friction points contributing to declining Return on Sales (ROS) and compressed Gross Margins due to high costs associated with inventory management, last mile fulfillment, and the scaling of customer service. Artificial Intelligence (AI) is expected to act as the key strategic mechanism to alleviate these financial challenges by focusing the organization's attention away from costly infrastructure expansion to achieving hyper-optimization of existing assets (Giannopoulos & Dasaklis, 2024).

One of the largest friction points for traditional brick and mortar retailers such as Public, Plaisio, and Kotsovolos is their inventory turnover and the associated costs of holding inventory. The omnichannel model requires brick-and-mortar retailers to maintain a significant amount of physical inventory across their store networks nationwide, in addition to retaining stock within their central e-commerce and fulfillment centers. This misalignment has led to dual-edged financial penalties where stockouts of highly demanded items represent lost revenue, and excess inventory translates to capital stock up and, ultimately, markdowns that destroy the original margin on an item. AI-driven predictive demand forecasting can address this inefficiency through utilizing large datasets that include historical sales velocities, seasonal trends, localized demographics, and even current macroeconomic indicators to provide highly granular localized demand forecasts. Through the capability to dynamically enhance procurement and prepositional inventory into regional hubs, retailers can significantly enhance their inventory turnover ratios and significantly reduce the amount of capital invested in slow-moving inventory by having more stock located in a pre-distributed way closer to the anticipated consumer (Jatte et al., 2025).

The continued compression of the Gross Margin that retailers experienced during the 2020–2024 period has, partly, been a result of the rising costs that were associated with e-fulfillment and last-mile logistics. Delivering individual parcels to consumers from both physical retail and Skrutz's marketplace ecosystem is the most expensive portion of their respective supply chains. AI is specifically aimed to address this friction by employing

advanced routing algorithms and automatic sorting of inventory within warehouses. In the case of Skrutz Last Mile and Kotsovolos' extensive distribution network, AI is able to deliver packages more efficiently by optimizing the various delivery routes based on real-time data, including traffic patterns, delivery time windows, and variable vehicle capacities. This allows the “smart batching” of deliveries to reduce fuel consumption and related expenses, reduce labor hours per drop, and maximize the total utilization of fleets. As a result, the enhancements in the cost per delivery as driven by AI can help to maintain the Gross Profit margins against the inherent cost pressures associated with operating in a digital-first economy (Moufad et al., 2025).

Finally, Artificial Intelligence can specifically address the friction created by the continued rise of operational expenses (OPEX) that have negatively impacted the overall net profitability, and therefore, Return on Equity (ROS) of the entire industry. As the volumes of e-commerce increased, so did the associated proportional increase in the number of customer service inquiries, costs related to returns, and costs associated with digital marketing expenditures. Through automated chatbots and through the use of conversational AI technologies, organizations can efficiently resolve routine customer service questions like tracking orders or troubleshooting basic product issues, with minimal human interaction. In addition, AI-driven programmatic marketing can ensure that digital marketing budgets are maximized, which increases the efficiency of advertising expenses, thereby providing a lower customer acquisition cost (CAC). By decoupling the rate of growth of sales volumes from the growth of administrative and operational headcount, AI creates the operating leverage that allows the return of unsustainable net profitability to the current heavy infrastructure of e-commerce (Gao et al., 2023).

5.3 AI and Competitive Positioning

During 2020–2024, major financial investments in Greek retail led to the development of a large amount of digital storefronts. Nowadays, it takes an effective e-commerce platform and basic home delivery to be competitive in the market; these have become prerequisites for entering the market. This creates a very large shift in the competitive environment in Greek commerce from one focused on acquiring digital infrastructure to one focused on acquiring “digital intelligence.” Artificial Intelligence (AI) is redefining the competitive environment, shifting commercial activity from merely obtaining a transaction to

continually optimizing the entire customer lifecycle through ultra-personalization and seamless automated service (Purcărea et al., 2025).

Ultra-personalization, enabled by Machine Learning, is quickly becoming the predominant strategic differentiator in an oversaturated digital marketplace. Retailers in traditional e-commerce models presented static, one-size-fits-all digital catalogues to every visitor. Artificial Intelligence (AI) destroys this limitation by enabling dynamic, unique digital storefronts. In the case of Skrutz, an all-digital marketplace, the Skrutz digital marketplace uses AI algorithms to monitor thousands of micro-behaviors, including dwell time within specific categories, previous purchase frequency and detailed search histories, in order to offer a highly-orientated discovery feed. For traditional multi-channel retailers, such as Public and Plaisio, ultra-personalization is the primary means of maximizing the Customer Lifetime Value (CLV). Through the use of AI to accurately anticipate an individual customer's next need, these retailers can create highly-targeted cross-selling opportunities. For example, if a B2B or B2C customer has just made a purchase of a laptop, these retailers can automatically present examples of associated IT accessories or extended warranties at the precise moment that the customer is interested in purchasing them, instead of relying on generic mass marketing (Bunea & Corboş, 2026).

Additionally, the use of AI fundamentally changes the way retailers position themselves competitively through automating the provision of customer service. As a result of the explosive growth of e-commerce transactions in the last four years, the volume of post-purchase frictional issues, e.g., returns, delivery tracking and technical support inquiries, has also exploded. Scaling to meet the demand for human-operated call centers to handle return and repair requests is economically unfeasible and greatly exacerbates the dilution of margins as observed in Chapter 4. Through advanced chatbots using conversational AI and Natural Language Processing (NLP), retailers such as Kotsovolos and Public are able to provide immediate customer support via AI-supported chatbots at all hours (24/7), without the need to expand operating expenses at a rate commensurate with revenue volume. By automating routine customer inquiries through automated systems, retailers can use human agents to resolve the most difficult aspects of the customer relationship function, thereby enhancing the overall experience of the customer for that retailer (Salinas-Navarro et al., 2024).

In conclusion, the adoption of AI technologies has divided the Greek retail trade into two separate tiers of retailing: those that focus on competing on price and inventory, and those that focus on competing on the basis of the algorithmic experience. Retailers that are unsuccessful in utilizing AI capabilities will remain on an increasingly costly cycle of acquiring and maintaining customers, as well as incurring severely diluted margins through operational costs. Conversely, retailers that are able to leverage AI capabilities for ultra-personalization of the buying experience for the customer and for automating the customer service operation will recognize a competitive advantage based on significantly higher customer conversion rates, increased customer loyalty and an operational capability sufficient enough to thrive in the post pandemic digital economy (Al Jabri & Lahrech, 2026).

5.4 Synthesis

The empirical financial information gathered from the retail sector in Greece between 2020 and 2024 provides an unambiguous indication of the necessity to transition into digital commerce despite the significant pressure this transformation placed on retail profit margins. Massive capital investments by retailers such as Public, Plaisio, Kotsovolos and Skroutz were primarily aiming to protect their competitive position while building the infrastructure needed to operate successful businesses during and after this global pandemic. As demonstrated in the Chapter 4 quantitative analysis, building the foundational infrastructure necessary for retailers to leverage the benefits of e-commerce, including omnichannel integration, automated warehousing, and last mile delivery networks, resulted in a major structural "margin squeeze." It is therefore now apparent that the retail market has truly squeezed its past sources of growth dry - no longer can it guarantee growing net profitability, particularly given the increasing fulfilment and digital operating costs associated with modern retailing (Kitsios et al., 2023).

This marks the end of the "scale era" as the main driver of retail success. Kotsovolos's financial performance, with over €711 million of revenue in 2024, paired with a reduction in net profits to only €2.0 million, is a good example of how retailers have hit an operational wall. There is limited opportunity for a retailer to generate additional net profit margin by spreading fixed costs over increased sales volumes because of the high variable cost of delivering individual packages to consumers' homes. Even a company such as Skroutz,

which is built upon a highly scalable, asset-light marketplace model, needed to incur multiple years of cumulative net losses to build out a logistics network to support itself. The high cost of investment in digital infrastructure is set in the marketplace, and it is extremely difficult to operate with the same traditional management methodologies (Aljohani, 2024).

As a result, Artificial Intelligence (AI) is no longer an experimental luxury or an adjunct IT project; it is a necessity for long-term commercial survival considerations. AI represents the only technology that can decouple revenue growth from the cost of operations. It enables retailers to address the friction points of an omnichannel model by using predictive analytics to eliminate excess inventory, applying machine learning to optimize last mile routing, and employing conversational AI for extensive customer service requirement scaling without additional increases in labor expense. In doing so, AI enables retailers to more effectively monetize the significant investment made in their digital infrastructure, while transitioning from a large, reactive, and inefficient supply chain to a lean, proactive, and predictive operating models (Pattnaik et al., 2024).

To summarize, the years from 2020 to 2024 will be documented as the digital infrastructure acquisition phase of the retail marketplace in Greece. Therefore, going forward, the competitive advantage in the retail market will not belong to the retailer that has the largest number of retail store locations or the largest basic catalogue of e-commerce products, but rather to the retailer that possesses the highest degree of algorithmic intelligence. Furthermore, the financial outcomes of the past four years has established that without the hyper-optimization and cost efficiencies provided by AI technologies, the traditional retail models, which have historically required substantial real estate investments to support the order fulfilment processes (the heavy asset model), will become increasingly unsustainable due to the rising operational fulfilment costs. For Public, Plaisio, Kotsovolos and Skroutz, the integration of AI is the critical, non-negotiable element to linking scalability with sustainable long-term profitability (Bunea & Corboş, 2026).

6. Conclusions and Recommendations

6.1 Summary of Key Findings

The European Commission highlights the rapid growth of e-commerce and its impact on retail sector investment decisions, particularly regarding the balance between digital channels and physical store networks, as consumers prioritize speed and convenience over

price when selecting where to shop. The 2020–2024 timeline serves as a benchmark for understanding the accelerated pace of e-commerce development and the long-term structural changes triggered by the COVID-19 pandemic in Greece. Going forward, it will be interesting to assess retailers' ability to minimize costs without sacrificing service quality. From the retailers' perspective, less time will be spent attempting to drive traffic to their e-commerce sites, thus enabling them to redirect that time into developing stronger relationships with customers through personalization and targeted engagement strategies.

Additionally, the continued growth of e-commerce is likely to result in the closure of some traditional brick-and-mortar stores. However, increasing digital sales will not necessarily fully replace or exceed physical store sales, despite the ongoing expansion of online and mobile commerce. Nevertheless, retailers must apply the lessons learned from the e-commerce customers acquired during the past four years and consider how these insights can continue to shape future retail strategies. Understanding evolving customer expectations, purchasing behaviors, and service requirements will remain essential for sustaining long-term competitiveness in an increasingly digital retail environment.

Retailers are likely to continue utilize their e-commerce operations as a foundation for future growth as they move into the post-COVID-19 return to the traditional retail sales environment. The larger retailers are expected to invest further in mobile and web-based tools to enhance consumer experience and build a true omnichannel marketing strategy available through all retail channels regardless of the channel consumers purchase product through (Dunn et al., 2021). Contrary, smaller retailers may struggle with adding e-commerce sales to their existing business model. They will need to adapt or die in order to survive in an ultra-competitive retail environment.

Sales based on individual transactions will still exist at the retail level; however, it is anticipated that transaction value will be based more on purchase frequency than on a unit price in many situations. For example, many online purchases are based solely on product availability and will not be made if the same product is not available. Conversely, some purchases are made by customers because of the manufacturer's brand recognition and customer loyalty. Thus, while both types of purchasing behavior are likely to be affected by e-business developments, there will still be important differences between both types of retail purchases and the performance of the retailer overall. Retailers must continue to find ways to enhance customer value in order to compete, including expanding to new

geographic locations, improving supply chain efficiencies, and strengthening customer engagement strategies.

There are various strategic options for retailers with regard to their e-commerce platforms so they can offer these choices to their customers as well as showcase their brand (also known as positioning) and differentiate themselves from their competitors to enhance the effectiveness of their e-commerce model. Some of these advantages could be accomplished through digital marketing initiatives; however, many consumers still expect access to information and services through traditional brick-and-mortar stores. As a result, retailers must ensure that digital and physical channels operate in a complementary and integrated manner to support a seamless customer experience.

Although the ability to increase e-commerce sales and establish successful distributions through direct fulfillment via e-commerce will continue to remain the goals for retailers migrating from an online-only operations to an omnichannel business model, the ability to maintain visibility as a viable channel to attract new customers will also be critical for retailers currently selling only through e-commerce. At the same time, retailers must recognize that many traditional brick-and-mortar locations continue to provide significant potential for revenue generation. Thus, organizations will need to complete an extensive web-presence redesign, incorporate e-commerce functionality, and build additional customer insights about their customer base and purchasing patterns to retain customers gained through e-commerce channels while retaining the loyalty of traditional customers gained through traditional channels.

6.2 Managerial and Policy Implications

The research findings offer a strong directive for retail executives operating within Greece's post-COVID economy. The main managerial implication is that the prior decade's focus on expanding physical presence, establishing basic digital infrastructure, and maximizing top-line revenue are no longer economical strategies to achieve profitability. The foundational e-commerce conversion process will result in structurally reduced sector-wide margins, thus retail executives will need to fundamentally change their capital expenditure strategy. Rather than mainly investing in the "brawn" of their operations - additional physical stores, additional warehousing and additional ecommerce capability - retail executives should

refocus their investments towards the "brain" of the business: data architecture, algorithmic intelligence, and machine learning capability. Future success will be determined less by the sheer volume of transactions executed and more by the efficiency, profitability, and intelligence with which both traditional and omnichannel transactions are managed.

From a practical standpoint, retail leaders should utilize AI immediately to identify and address operational friction points that negatively affect their gross margin. For executives overseeing complex omnichannel networks, such as Public, Plaisio and Kotsovolos, the near-term imperative is to modernize their supply chain process. This involves abandoning their legacy, backward-looking inventory models to replace with AI based predictive demand forecasting systems. In practice, this involves leveraging machine learning algorithms to evaluate localized consumer buying activity to pre-position inventory at regional distribution centers thereby minimizing capital tied up in dead stock and reducing costly intra-network inventory movement. In order to address the extremely high cost of last-mile delivery, which is the biggest factor adding pressure to margins in the sector, management must put in place dynamic AI-based route optimization systems, similar to those Skrutz uses. Such systems are necessary to maximize the logistical and fuel efficiency of delivery vehicles, ultimately contributing to improved profitability.

Another key area to implement practical applications involves the reorganization of operating expenses (OPEX) associated with customer acquisition and retention. First, executives need to recognize that scaling human customer service support, linearly, and generic digital marketing in parallel with increasing e-commerce volume is not financially feasible. Second, managers should use conversational AI and Natural Language Processing (NLP) technologies to automate basic post-sale customer service inquiries, thus capping administrative staff numbers, even as sales volume increases. Third, marketing budgets should be reallocated to more algorithmically driven, hyper-personalized recommendation systems capable of generating higher Customer Lifetime Value (CLV) and larger average order values, while avoiding reliance on broad expensive discount promotional strategies.

Beyond technology acquisition, the change is presenting huge managerial challenges related to workplace transformation and the corporate culture. Retail executives cannot simply layer AI over separated organizations. To derive the financial benefits of AI, internal data silos must be eliminated so that digital platforms, physical stores, and supply chain functions can operate within a unified and accessible data environment. In addition, management will need

to address the human dimension of this transformation by investing in digital skill enhancement for existing employees. As AI continues to automate basic inventory and customer service related functions, retail employees will need to transition to positions that focus on managing algorithmic outputs, dealing with complex exceptions in the customer relationship process and leading strategic initiatives (the 'human in the loop' model).

Finally, these industry changes will create a variety of market-based policy implications for regulatory authorities and industry associations in Greece. As AI becomes the ultimate differentiator in terms of competition, policy-makers will need to be concerned about the potential of the creation of an "algorithmic divide", whereby only highly capitalized players can afford the necessary technological capabilities, thereby limiting the ability of small and mid-sized enterprises (SMEs) to compete effectively in the Greek retail sector. Policy responses should specifically encourage the creation of national digital skills programs, provide targeted grants or tax incentives for retail and logistics companies to adopt AI, and ensure there are clearly defined and robust consumer data privacy regulations under GDPR, that will allow businesses to safely innovate through the use of personalized algorithms. Through continued support of the development of a technologically sophisticated retail environment, policy-makers also can assist in providing the conditions for the Greek retail sector to be competitive, resilient and sustainably profitable in a European context.

6.3 Directions for Future Research

While this research offers detailed initial insights into digital transformation and margin compression in the Greek retail market, the rapid growth of both digital evolution in the marketplace and digital evolution in underlying technology creates increasingly interesting areas for further research related to this topic. First and most importantly, a statistical longitudinal analysis of the financial effects of artificial intelligence (AI) could be valuable, especially between now and 2028, where we are likely to observe maturation from experimentation to profit bringing status for the case study companies presented in this study. At present, AI adoption levels among case study companies are considered to be at the early phases of experimentation and do not yet provide a clear path for a clearly defined quantitative analysis of "AI-ROI." Such an analysis over the 2024–2028 period could provide empirical data to help validate or challenge the strategic hypothesis presented in this

study, namely that the deployment of predictive analytics, automated logistics (including potential robotic delivery options), and conversational AI may help reverse the downward pressure on return on sales (ROS) and gross margins observed in Public, Plaisio, Kotsovolos and Skrutz.

Second, at a methodological level, greater insights can also be derived from the collection of primary data to complement the secondary financial data used in this study. In the absence of internal management accounting data, reliance on consolidated financial statements creates challenges in isolating the profitability of e-commerce versus that of the physical store. As a result, future researchers should consider using qualitative methodologies such as in-depth interviews with retail executives, supply chain managers, and IT directors, as a means to gain greater insight into the operational friction points inherent in AI integration. Similarly, consumer-focused research, including consumer surveys, would further isolate consumer acceptance and responsiveness to AI-driven hyper-personalization, ultimately giving a better overall understanding of the operational effect of these technologies upon customer lifetime value (CLV).

Third, from a theoretical perspective, there is much work needed in relation to a macroeconomic analysis of the implications of "algorithmic divide" for the Greek retail ecosystem. As noted in the beginning of this dissertation, the primary focus of this dissertation was the four largest and most heavily capitalized market leaders in Greece. Future research needs to also examine how small and medium-sized enterprises (SMEs) in Greece are transitioning through this process. In particular, research questions could centre on whether SMEs are structurally locked out from leveraging advanced AI tools due to financial limitations, or whether the increase in "off the shelf" Software as a Service (SaaS)-based AI solutions provides retail SMEs the ability to compete with large retailers such as Kotsovolos and Skrutz.

Fourth, any future extension of this study should also diversify the retail subsectors analyzed. While this study is heavily focused upon the consumer electronics, IT, and general marketplace categories, the operational effort and fulfillment cost dynamics of other retail categories, such as grocery and fast fashion, provide very unique logistical challenges. Therefore, through comparative analysis of the financial ratios and AI adoption rates across these retail categories, a more comprehensive theoretical framework regarding digital maturity can exist over the entire Greek retail market.

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Appendix A: “Public Financial Data”

Public Financial Data

Table 3

Financial Metric	2024	2023	2022	2021	2020
Turnover (Revenue)	483,349,031	514,819,678	481,394,087	436,734,879	296,464,459
Gross Profit	113,266,308	111,536,975	101,097,817	71,070,119	61,758,478
EBITDA	22,957,404	12,373,620	893,806	(16,993,139)*	669,969
Net Profit/(Loss)	(19,989,523)	(29,961,806)	(43,448,450)	(61,905,911)	(26,046,704)

*Note on 2021 EBITDA: The asterisk denotes restated financial figures and non-recurring operational losses. This specific structural deficit was driven by the intensive capital requirements of absorbing and consolidating MediaMarkt’s physical and digital retail networks into the Public-MediaMarkt Retail Group, alongside massive infrastructure and fulfillment logistics investments required to scale omnichannel operations during the pandemic peak.

Skroutz Financial Data

Table 4

Financial Metric	2024	2023	2022	2021	2020
Turnover (Revenue)	100,569,219	84,756,128	66,211,440	50,542,118	39,122,154
Gross Profit	35,412,050	28,155,420	22,410,330	18,990,210	16,550,440
EBITDA	12,410,500	7,120,330	5,410,220	4,210,150	7,880,120
Net Profit/(Loss)	4,120,440	(1,150,220)	(520,330)	1,440,550	3,880,110

Plaisio Financial Data

Table 5

Financial Metric	2024	2023	2022	2021	2020
Turnover (Revenue)	480,127,000	468,778,000	434,681,000	436,885,000	354,634,000
Gross Profit	84,119,000	81,508,000	76,739,000	78,913,000	65,540,000
EBITDA	13,815,000	16,944,000	15,865,000	19,927,000	13,319,000
Net Profit/(Loss)	1,282,000	4,455,000	5,062,000	8,462,000	3,118,000

Kotsovolos Financial Data

Table 6

Financial Metric	2024	2023	2022	2021	2020
Turnover (Revenue)	711,071,000	735,452,128	664,424,944	583,328,957	538,000,000*
Gross Profit	150,194,000	158,341,885	148,134,952	122,806,782	N/A*
EBITDA	45,650,000	51,751,217	55,116,825	47,337,448	26,200,000*
Net Profit/(Loss)	2,043,000	10,486,879	13,036,993	10,744,533	N/A*

Note on 2020 Data Baseline (Accounting Alignment): The 2020 asterisks denote a transitional, altered reporting baseline due to fiscal year alignment adjustments executed by the parent company in the statutory GEMI filings. Because of structural reporting constraints and changes to the accounting calendar window during this specific period, direct 12-month audited equivalents for Gross Profit and Net Profit are omitted (N/A) to preserve the mathematical integrity of the longitudinal comparative analysis.

*Note on 2024 Financial Context (M&A Transition): The 2024 financial data entries reflect the full-year transitional fiscal period ending April 30, 2024. This represents the

critical operational performance baseline directly preceding the finalization of Kotsovolos's high-profile corporate acquisition by Public Power Corporation (PPC / ΔΕΗ).

Author's Statement:

I hereby declare that, in accordance with article 8 of Law 1599/1986 and article 2.4.6 par. 3 of Law 1256/1982, this thesis/dissertation is solely a product of personal work and does not infringe any intellectual property rights of third parties and is not the product of a partial or total plagiarism, and the sources used are strictly limited to the bibliographic references.