Universidade do Minho
Escola de Economia e Gestão

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Emerging Dynamics in Marketing Finance: Understanding the Individual Investor Journey

april de 2024

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Emerging Dynamics in Marketing Finance: Understanding the Individual Investor Journey

Doctoral Thesis in Marketing and Strategy

Conducted under the supervision of:
Professora Cláudia Simões

april de 2024

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

Resumo

Esta tese examina o conceito da Jornada do Investidor Individual dentro do escopo do Marketing Financeiro, articulado através de dois estudos distintos: uma revisão da literatura e uma investigação empírica sobre a Jornada do Investidor Individual. O primeiro estudo, é uma revisão da literatura abrangente, explora a evolução histórica e teórica do marketing financeiro. Neste estudo observamos uma mudança de foco das práticas de marketing de mercado para os comportamentos de investidores individuais, sublinhada pela crescente importância da tecnologia e do individualismo nas decisões financeiras. Temas chave como satisfação do cliente, valor para o acionista e equidade de marca têm sido constantes, com estudos recentes propondo uma exploração mais detalhada do comportamento do investidor individual.

O segundo estudo concentra-se na Jornada do Investidor Individual, conceituando-a como um processo de três fases — pré-compra, compra e pós-compra. Este modelo é essencial para compreender como os comportamentos dos investidores individuais são influenciados durante as diferentes fase do processo de investimento, particularmente na captura das nuances de tomada de decisão influenciadas pelas condições do mercado e estratégias de marketing. As nossas hipóteses exploram as dinâmicas das condições de mercado afetadas por tendências nas redes sociais e o sentimento dos investidores, sugerindo que esses elementos afetam significativamente o comportamento do investidor e, consequentemente, os preços de mercado das ações das empresas em foco.

Globalmente, a tese visa preencher a lacuna teórica sobre o comportamento dos investidores individuais, e como são influenciados, por estratégias de marketing dentro dos mercados de capitais. As nossas descobertas propõem uma compreensão matizada do marketing financeiro, especialmente considerando a mudança em direção à predominância do investidor individual, que pode abrir uma avenida de investigação para futuros trabalhos nesta área.

Palavras-chave: Jornada do Investidor Individual, Marketing Financeiro, Comportamento do Investidor, Dinâmicas de Mercado, Tendências das Redes Sociais, Sentimento do Investidor

Abstract

This thesis examines the concept of the Individual Investor Journey within the scope of Marketing Finance, articulated through two distinct studies: a literature review and an empirical investigation about the Individual Investor Journey. The initial study, a comprehensive literature review, delves into the historical and theoretical evolution of marketing finance. It highlights a shift in focus from broad market practices to the behaviors of individual investors, underscored by the growing significance of technology and individualism in financial decisions. Key themes such as customer satisfaction, shareholder value, and brand equity have been perennial, with recent studies proposing a more granular exploration of individual investor behavior.

The second study centers on the Individual Investor Journey, conceptualizing it as a three-phase process—pre-purchase, purchase, and post-purchase. This model is vital in understanding how individual investors' behaviors are influenced during different stages of investment, particularly in capturing the nuances of decision-making influenced by market conditions and marketing strategies. Our hypotheses explore the dynamics of market conditions impacted by social media trends and investor sentiment, suggesting that these elements significantly affect investor behavior and consequently, market prices.

Overall, the thesis aims to bridge the theoretical gap by applying empirical insights to understand how individual investor behaviors are influenced by marketing strategies within the capital markets. Our findings propose a nuanced understanding of marketing finance, especially considering the shift towards individual investor preponderance, which could reshape future research and practice in the field.

Keywords: Individual Investor Journey, Marketing Finance, Individual Investor Behavior, Individual Investor Preponderance, Investor Sentiment

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1. Introduction

1.1. Overview

This thesis examines the overarching concept of Individual Investor Journey within the Marketing Finance boundaries and utilizes two individual's studies as a foundation for this investigation. The research approach adopted in this thesis involved conducting one study that is a literature review to gain insights into the concept of marketing finance. The second study of this thesis focuses on a specific topic, the individual investor journey, that is considered central to marketing finance and represents a promising research stream for future investigations.

1.2. Research gap

The research gap addressed by our study primarily focuses on exploring the journey of the individual investor from the perspective of marketing finance. To date, there has been no study examining the individual investor's journey. The contribution of this thesis will be to enhance understanding of the individual investor's decision-making process throughout their investment journey.

1.3. Research questions and hypothesis

The first study involves a systematic literature review on Marketing Finance. This research aims to address the question **of how research in marketing finance has evolved over time and what its implications are for practical applications**. The objectives are fourfold: (1) To provide an in-depth understanding of the historical development of research in marketing finance. (2) To identify the primary focuses and key areas of research in marketing finance. (3) To explore future research questions and potential areas for growth in the field of marketing finance. (4) The methodology

used can serve as a valuable roadmap for producing further knowledge in the field of marketing finance.

The second study, which investigates the Individual Investor Journey, is based on four research hypotheses.

To study the complex interaction between market dynamics and individual investor psychology. We will utilize the popularity trends on social media to approximate investor sentiment, as suggested by Da et al. (2011), we investigate how these market conditions are interpreted by investors. Our hypothesis posits that positive sentiment encourages more investment, increasing demand and asset prices, while negative sentiment results in a bearish outlook that may cause a sell-off and price decrease, as outlined by Banerjee & Kundu (2024). Hence, we propose that:

H1: Market trading conditions (measured in terms of investor sentiment) exert a positive influence on the decision-making processes of individual investor.

This study investigates the relationship between social media popularity and investor sentiment to determine if social media trends can predict investor attitudes. The study aims to assess the accuracy of social media in reflecting investor sentiment which affects market behavior and stock pricing (Zhang & Shen, 2024; Audrino et al., 2020). The hypothesis posits that social media popularity is an effective predictor of investor sentiment. Hence, we propose that:

H2: Higher popularity on social media corresponds to a more positive investor sentiment.

Previous studies such as those by (Baker & Wurgler 2007, Barber & Odean 2013, Kaniel et al. 2008, and Kumar & Lee 2006) have focused on exploring the relationship between individual investor participation and stock price fluctuations, finding inconsistent correlations. This study re-evaluates these assumptions within the current economic context. Traditionally, the weak link between individual investor involvement and stock movements has been attributed to multiple influencing factors like company news, macroeconomic conditions, and institutional trading, which may overshadow individual investor impact. Additionally, individual investors typically have fewer resources than institutional ones. Recent trends, however, show a significant impact of collective actions by individual investors on stock prices, despite their lower market share. Hence, we propose that:

H3 There is a significant relationship between the preponderance of individual investors and stock price valuations. An increase in the trading activity of individual investors corresponds to an increase in share prices.

After analyzing previous hypotheses, we will now explore the reverse relationship — specifically, how changes in stock prices influence individual investor activity (Ding & Hou, 2015; Hong & Stein, 1999). We aim to quantify this effect and assess the directionality, determining if an increase in stock prices leads to increased individual investor participation. Accordingly, we propose that:

H4. An increase in stock price corresponds to an increase in individual investor trading activity.

This thesis is structured into two studies focused on exploring the domain of Marketing Finance and the Individual Investor Journey. The first study serves as a foundation, addressing the research question on how the knowledge in the field of marketing finance has evolved. It has four specific objectives. The second study pivots to a more focused examination of the Individual Investor Journey, aiming to delve deeper into how this journey influences and is influenced by various market dynamics. It proposes four hypotheses to understand better the interplay between the Individual Investor Preponderance (IIP) and Investor Sentiment (IS) within the individual investor's decision-making process. By integrating the findings from both studies, this thesis intends to provide new insights into the investor's journey while elucidating the evolving dynamics of marketing finance, ultimately offering a richer understanding of how individual behaviors and market responses intersect within the capital markets domain.

1.4. Studies introduction

1.4.1. First Study – The evolution of marketing finance concepts: From friends to the individual investor. A systematic literature review.

The initial phase of this thesis encompassed a literature review aimed at tracing the historical evolution and theoretical articulation of the marketing finance concept. Marketing Finance appeared from investigating how marketing activities influence firm value. It establishes metrics to assess the financial impacts of these endeavors. Initially focused on the synergy between marketing and finance departments, the field has evolved to encompass broader evaluations of marketing effectiveness (Frommelt et al., 1987; Srivastava et al., 1998). This field, having garnered considerable academic attention in recent decades, was underexplored until the late 1990s. Hyman and Mathur (2005) elucidate three main factors contributing to this gap: the differing focus

on data collection methods in marketing and finance, the prevalent use of diverse methodologies within these disciplines, and the distinct academic goals pursued by scholars in each field. The concept of marketing finance, focusing on the correlation between marketing activities and firm value, was progressively developed by researchers like Srivastava et al. (1998), Zinkhan & Christian Zinkhan (1997), and Frommelt et al. (1987). This research stream generated the marketing finance interface, which sets out metrics to evaluate the relationship between marketing endeavors and firm value. Further investigations widened the scope, introducing new concepts such as customer valuation (Gupta et al., 2004), customer satisfaction (Kumar & Petersen, 2005), the relationship between the firm and investors (Hoffmann et al., 2011), along with brand equity and brand value (Kumar et al., 2020; Bharadwaj et al., 2020). Additionally, Hanssens and Pauwels (2016) explored the overall value derived from marketing activities, expanding the depth and breadth of marketing finance studies.

To select the works that were included in our literature review, we carried out a preliminary analysis using previously studied material. We further searched the bibliographic databases Scopus and Web of Science with the keywords "Marketing Finance," "Finance Marketing," and "Financial Marketing" in the titles, abstracts, or keywords of English-language publications available until April 2023. Subsequently, using a selection grid, we identified and selected 134 articles that satisfied the defined criteria for inclusion in our literature review. By analyzing the evolution of the study of marketing finance throughout time, we concluded that there is a temporal gradation of the importance of concepts. Over time the main themes were perennial in this field of research, the marketing finance interface, customer satisfaction, shareholder value, firm value, brand equity and brand value prevail in many scholarly studies in this field of research. But in general, we observe a shift from the subject to the individual. Nowadays the focus is on the individual with more and more prominence and presence of technology in all processes. The relationship between the

behavior of individual investors and the role of marketing in influencing their decision-making processes has been investigated in recent papers (Sorescuu et al., 2017 and Edeling et al., 2021). These authors shed light on the subject by exploring the intersection of individual investor behavior and marketing strategies.

1.4.2. Second Study – The Individual Investor Journey

The second study of this thesis we focus on the Individual Investor Journey The relationship between the behavior of individual investors and the role of marketing in influencing their decision-making processes has been investigated in recent papers (Sorescu et al. 2017 and Edeling et al. 2021). These authors shed light on the subject by exploring the intersection of individual investor behavior and marketing strategies. In light of this we study the necessity for further exploration of individual investor behavior, specifically in the context of emerging trends in capital markets.

This study explores the significant influence of individual investors on stock markets, highlighted by the dramatic rise in GameStop's stock due to actions by individual investors on the Reddit forum r/wallstreetbets, culminating in a 1700% increase in stock value by January 2021 (Zheng et al., 2022 and Kim et al., 2023). Accelerated by an influx of new investors post-2020 global lockdowns, this trend marks a shift towards self-managed, tech-enabled trading (Osipovich, 2020), challenging traditional investment methods and the role of intermediaries. The research delves into how this democratization affects the global capital market structure. It investigates both the perceived irrationality in market behaviors and the evolving relationships between companies and their individual investors (Long et al., 2023). The study focuses on the individual investor's journey through the share selection process to identify how emotional and psychological factors, rather than just financial logic, influence investment decisions, contrasting the predominant efficient

market hypothesis (Barber & Odean, 2008). This exploration seeks to provide deeper insights into how emerging investor autonomy and behavior affect broader market dynamics and investment strategies.

To construct our model, we employed real data from the North American capital markets, specifically focusing on the NYSE and NASDAQ due to their significant appeal to individual investors, large size, and high transaction volumes. We targeted the commercial aviation sector, specifically analyzing major players like United Airlines, American Airlines, Delta Airlines, Southwest Airlines, and Alaska Airlines, which collectively constitute approximately 89.54% of this sector's market capitalization. This selection was aimed at minimizing external market disturbances. Our data spanning from January 2012 through September 2023. Over this period, we processed more than 290 million lines of data across 141 months. We utilized data on social media trends to assess Investor Sentiment towards these companies—considered a reflection of investor sentiment, aligning with methodologies from prior research such as Da et al. (2011) and Kim et al. (2023). Additionally, we collected stock price data for these companies from Investing.com, providing a detailed and comprehensive dataset for a thorough analysis.

The Individual Investor Journey model that we build, captures the relationships among relative variations in daily traded volume, daily number of transactions, social sentiment of the day, and daily price variation of the security. The difference between the relative variations in traded volume and number of transactions will provide insights into the behavior of the individual investor. In our study, we propose that this difference captures the behavior of the individual investor because volume includes movements from institutional investors and individual investors. However, the difference between the variations in volume and number of transactions captures the interference of individual investors. Additionally, when we observe a variation in the number of transactions that

is greater than the variation in traded volume, we estimate that individual investors have had a positive statistically significant intervention at that moment. To identify the behavior of individual investors, we create a quantitative variable that captures the variation in the activity of individual investors, which we can refer to as: Individual Investor Preponderance (IIP).

2. First Study – The evolution of marketing finance concepts: From friends to the individual investor. A systematic literature review.

2.1. Abstract

Marketing Finance has emerged as a field that addresses the need to measure and establish indicators related to the value generated by marketing activities within a company. This literature review examines the evolution of the Marketing Finance concept over time, focusing on the relationship between marketing and finance, customer satisfaction, shareholder value, and brand equity. The research highlights the shift in focus from organizational-level analysis to individual-level analysis, influenced by technological advancements. Future research should explore individual investor behavior and understand their financial priorities and decision-making processes. The practical application of marketing finance includes measuring the financial impact of marketing actions and investing in customer satisfaction. Incorporating emerging trends such as artificial intelligence, population aging, and remote working is crucial. A research agenda for marketing finance should consider the influence of technology, demographic changes, and evolving work dynamics. This review contributes to the understanding of marketing finance but acknowledges the limitations in terms of cultural diversity and the need for further research on different markets and contexts.

2.2. Keywords

Marketing Finance, Marketing Finance Interface, Literature Review, Systematic Literature Review

2.3. Introduction

The foundation of the marketing finance concept can be traced back to its focus on the intricate relationship between marketing activities and firm value. This concept emerged as a response to the need for a deeper understanding of how marketing initiatives and strategies contribute to the overall value and performance of a company. Marketing Finance emerges from this need to establish metrics related to marketing activities, practices, tools, and their impact on the firm value. By examining the link between marketing actions and company worth, the field of marketing finance aims to shed light on the financial implications and impact of marketing efforts on the organization.

Seminal works in the field entailed the study of the relationship between both areas, marketing and finance, within the company. At this point emerged the idea that better relations between both areas lead a positive effect in the company (Frommelt et al., 1987). The scope of the field grew to involve metrics that would translate the performance of marketing related activities (Srivastava et al., 1998). Over the years, the field evolved to produce a substantial number of papers that studied the Marketing Finance concept.

Our aim is to delve deeper into the shared aspects of marketing and finance and establish pathways for future development. To achieve this objective, we undertake a comprehensive literature review that analyzes the evolution of marketing finance field and its conceptualization over time. However, it is important to acknowledge that there are challenges that impact the relationship between marketing and finance. Therefore, it is crucial to reflect on the historical progression of the field and outline potential future developments in order to provide valuable insights for decision-makers. By doing so, we aim to contribute to the body of knowledge surrounding marketing finance and provide a basis for informed decision-making in this field.

The concept of marketing finance has been around for some time, and in recent decades has been garnering the attention of various academics. But it was not always this way. According to Hyman

and Mathur (2005), until the end of the 1990s, with only a few exceptions, there were three primary reasons for the lack of research on the marketing finance concept. The first reason relates to the focus on data collection. Marketing focuses on the consumer or product, while finance focuses on firm-level data. The second reason is related to the first and involves the methodology used. Marketing primarily supports its study using primary data collected through questionnaires, while finance studies aggregated secondary data from markets and financial statements of companies. Finally, the third reason identified relates to the focus of the academic discipline itself. While marketing scholars are trying to establish the scope and scientific status of marketing, finance scholars orient their research around the corporate goal that firms should maximize shareholder wealth.

This study emerged from initial readings on the topic of marketing finance. Through a comprehensive search of bibliographic databases, a collection of works was identified that had not been addressed in existing literature reviews. This observation served as a catalyst for the development of a new literature review that aimed to incorporate these previously undetected works, as well as newly released studies since the last literature review in 2021[1].

Six pertinent literature reviews were identified in Table 1 - Previous literature reviews about Marketing Finance and published in peer-reviewed journals between 2005 and 2021. These works are fundamental to marketing finance research and form the common ground of this study. This study does not aim to replace previous works, its objective is to be a complementary work to support the research on marketing finance, bringing an additional set of studies that are fundamental to understand the marketing finance concepts and its evolution.

1 Although the study of Edeling et al. (2021) was published in December 2021 in the International Journal of Research in Marketing, the article selection was concluded by April 30, 2020.

Table 1 - Previous literature reviews about Marketing Finance

Authors	Year
Hyman and Mathur	2005
Conchar et al.	2005
Srinivasan and Hanssens	2009
Edeling and Fischer	2016
Sorescu et al.	2017
by Edeling et al.	2021

Through the analysis of previous literature reviews and the latest papers, this study aims to address **the research question of how research in marketing finance has evolved over time and its implications for practical applications.** The four objectives of this study are as follows. Firstly, to provide an in-depth understanding of the historical development of research in marketing finance. Secondly, to identify the primary focuses and key areas of research in marketing finance, identifying the terms created within the research field itself and pointing towards new avenues of research. Thirdly, to explore the future research questions and potential areas for growth in the field of marketing finance. Hence, the focus of this study provides essential insights into the state of the knowledge, emphasizing the areas that require further research. The selection of research questions and works of this literature review as well as the methodology used can serve as a valuable roadmap for producing further knowledge in the field.

2.4. Background: Establishing the scope of marketing finance

In accordance with the definition of marketing provided by the AMA - American Marketing Association (2017), "Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients,

partners, and society at large." Transposing this notion to our study, marketing finance may be defined as the activities and processes utilized by organizations to create value for shareholders and the market, through the communication of financial performance indicators or by monetizing marketing performance indicators.

The concept of marketing finance was initially developed with respect to the relationship between marketing activities and firm value, with various authors contributing to this investigation, Srivastava et al. (1998), Zinkhan and Christian Zinkhan (1997) and Frommelt et al. (1987)). Researchers studying the relationship between marketing and firm value identified a research stream defining the metrics to evaluate this relationship, known as the marketing finance interface. new concepts emerged from studies related to marketing finance. For example, valuing customers (Gupta et al., 2004), customer satisfaction (Kumar & Petersen, 2005), the relation between the firm and the investor (Arvid O. I. Hoffmann et al., 2011), brand equity (Kumar et al., 2020), brand value (Bharadwaj et al. (2020) and the value of marketing (Hanssens and Pauwels, 2016).

Table 2 - Marketing finance and related concepts presents the key concepts studied in the field of marketing finance, as well as the authors who have contributed to their study and development. The Table 2 shows the main topics studied in Marketing Finance, and the relationship with the authors who have developed the topics over time. Marketing activities and firm value and Marketing finance interface are the topics that have been studied by the most authors and those that have been perennially studied over time. Some topics, such as Valuing customers and Marketing productivity, have been studied at a certain point in time. But the main thing is that the table shows us that the themes have emerged over time and have captured the interest of authors.

Table 2 - Marketing finance and related concepts

Marketing Finance Related Concepts	References
Marketing activities and firm value *Several authors study the impact of marketing activities on firm value.*	Hirschey and Weygandt (1985); Horsky and Swyngedouw (1987), Conchar et al. (2005), Srinivasan and Hanssens (2009), Tipton et al. (2009), Joshi and Hanssens (2010), Luo and de Jong (2010), Kurt and Hulland (2013), Homburg et al. (2014), Ryoo et al. (2016), Edeling and Fischer (2016), Yang et al. (2018) and Boyd et al. (2019)
Marketing finance interface *A field of research that study the metrics of marketing activities on firm value.*	Ratnatunga et al. (1990), Locander and Goebel (1997), Zinkhan and Christian Zinkhan (1997), Pennings et al. (1999), Zinkhan and Verbrugge (2000), Lehmann (2004), Lovett and MacDonald (2005), Sidhu and Roberts (2008), Uzma and Kumar (2010), Mintz and Currim (2013), Mintz and Currim (2015), Bendle and Wang (2017), Barker and Milano (2018), Bendle and Butt (2018), Hanssens (2019) and Edeling et al. (2021)
Valuing customers *This is an important study that use de discount cash flows methodology to analyze customer valuation and its relationship to the value of the firm*	Gupta et al. (2004), (Rust, Lemon, et al., 2004) (Rust & Huang, 2014)
Shareholder value approach *A shareholder value approach uses the expertise in understanding customers, channels, and competitors, into marketing strategies to contribute and enhancing the value of the company for its shareholders*	Lukas et al. (2005), Balasubramanian et al. (2005), Terblanche et al. (2013) and Colicev et al. (2018)
Customer satisfaction *The degree to which customers' expectations are met or exceeded by the products, services, or experiences provided by a company*	Kumar and Petersen (2005), Fornell et al. (2006), Luo and Homburg (2008), Anderson and Mansi (2009), X. M. Luo et al. (2010), Merrin et al. (2012) and Luo et al. (2013), Malshe and Agarwal (2015), Peng et al. (2015), Bharadwaj and Mitra (2016), Vo et al. (2017) and Lim et al. (2020)
Marketing productivity *A framework that includes marketing strategies and tactics, their influence on customers, the resulting effects in the marketplace, the financial implications, and how they collectively impact the firm's value.*	Rust, Ambler, et al. (2004)
Relation between the firm and the investor	Arvid O. I. Hoffmann et al. (2011)

Involves transforming investor relationships into valuable market-based assets through a relationship marketing and stakeholder approach	
Brand equity and Brand value *Represents the additional cash flow generated by a product with a brand name compared to the cash flow without the brand name.*	Yang et al. (2015) and Farhang et al. (2023), Basgoze et al. (2016), Kumar et al. (2020) and Bharadwaj et al. (2020)
Value of marketing *"Study marketing value assessment from three perspectives: metrics, models, and communication. Combine historical data analysis with marketing experiments and significantly enhance the communication of analytical results to an audience of decision makers who are not analytically oriented (Hanssens & Pauwels, 2016, p. 187)".*	Hanssens and Pauwels (2016)

2.5. Methodology

The concept of marketing finance has developed in recent years therefore is of great importance to undertake a rigorous literature review to survey, comprehend, assess and construct theoretical foundations for this concept. A literature review is an essential task in order to understand the different knowledge areas that have already been studied and to create a reference map of past research which will be a fundamental basis for the formulation of research questions (Tranfield et al., 2003). A well-structured and effective literature review creates the basis for progress in knowledge. It facilitates the theoretical development, aggregates the knowledge in areas where there are various works and reveals fields where knowledge needs to be developed (Webster & Watson, 2002). There are different approaches to structure a literature review, narrative review, systematic review, and integrative review (Snyder (2019). Presenting combinations possibilities between them, namely the semi-systematic one. The different approaches are associated with different areas of knowledge. For the marketing area, Snyder (2019) proposes a systematic literature review.

Regardless of the approach, a literature review is constituted by four phases, namely, the design, the process, the results analysis, and the writing of the literature review. For each phase, we will pay attention to the guidelines to develop the work according to the required quality standards. A set of important guidelines for ensuring the quality and effectiveness of a literature review is put forth by Palmatier et al. (2018). These guidelines highlight factors such as depth and rigor, that is, a literature review cannot only select the articles that support a view of the theory under study, nor can it be a numerous collection of works without a necessary organization that allows an understanding of the different perspectives under study. The second success factor is replicability, the selection process of articles must be sufficiently described so that an interested reader can replicate the selection using the same criteria. The third success factor is usability. A literature review must present the theories, constructs, and definitions on the field of study, which can be particularly useful for researchers who come back to the field of study. Finally, the last success element is the usefulness of the format, i.e., the use of tables to systematize the extensive information helps the reading and understanding of the literature review.

When we quantitatively analyzed the article selections contained in each of the six previous literature reviews, we found that Edeling et al. (2021) had 285 articles, Sorescu et al. (2017) had 39 articles, Edeling and Fischer (2016) had 100 articles, Srinivasan and Hanssens (2009) had 39 articles, Hyman and Mathur (2005) had 56 articles, and Conchar et al. (2005) had 15 articles. This study´s literature review has 134 articles, which is less than the last 2021 review, however in our Literature Review we only selected peer reviewed published papers. We found that 94, from the 134, were not identified in the previous literature reviews. Out of these 94 articles, only 18 were published after the year 2020, thus we found 76 articles that were not identified in the previous literature reviews that are part of this literature review and were only identified through the research methodology employed in this research.

2.6. Building steps

We defined a set of keywords and conducted a search on online bibliographic databases to identify research studies pertinent to the literature review. We then selected these studies for further reading and to be included in this work. The literature review was conducted using a combined methodology of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 using the software EndNote20[2]. To guarantee a clear and accountable approach, we followed the guidelines set out by Page et al. (2021). EndNote20 Software was used to apply filters and choose studies to be included in the literature review (Bramer et al., 2017).

The methodology used to select the works integrated in the literature review followed a selection flowchart to initially identify duplicated works. Afterwards, three filters were applied, based on two reasons, to exclude works that did not meet certain requirements. Namely, the works incorporated in the literature review had to be peer reviewed journal articles and studied the principal concepts of marketing finance that were previous identified. That is, they had to explore the relationship between marketing and finance, the interface between these two core aspects of business, as well as the use of marketing approaches to communicate the financial elements of the company to shareholders and the market. Subsequently, we created tables and maps to present the different perspectives of research in marketing finance. The maps were created using Bibliometrix[3] software

[2] The EndNote20 Software is a bibliographic reference management software, developed by Clarivate Web of Science.

[3] Bibliometrix is an open-source software package that simplifies the process of data-analysis and data-visualization. After data files are uploaded and converted into R language format, Bibliometrix performs an insightful descriptive analysis and further analyses of a range of research structures. The user-friendly interface allows its users to make utilization of a wide range of data-visualizations and interpretations.

(Aria and Cuccurullo (2017). which is used for construction of networks of scientific publications, scientific journals, researchers and research organizations.

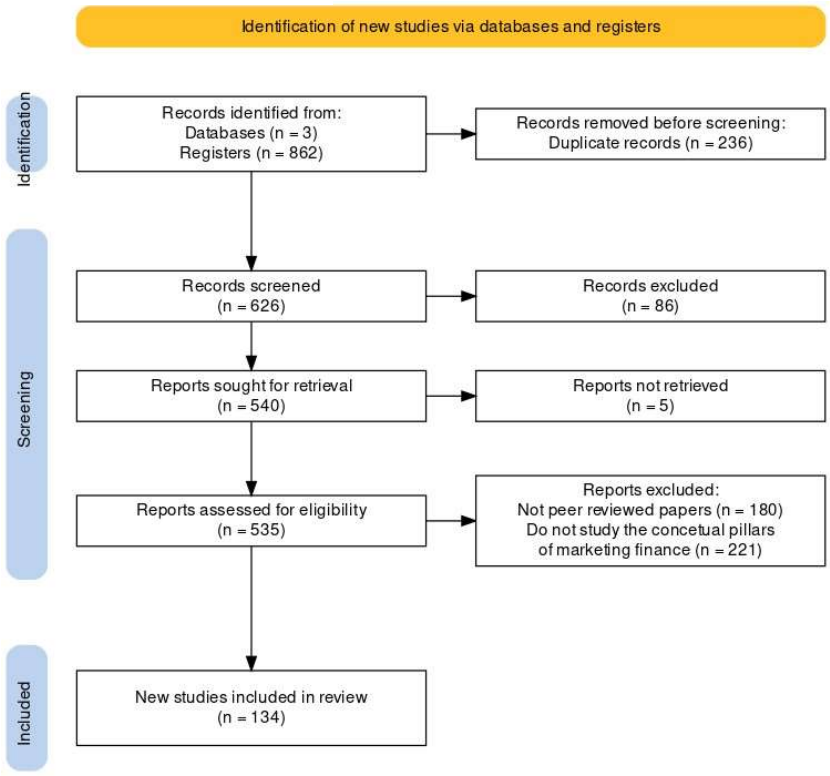
2.7. Data extraction

In order to select the works that would constitute the literature review, we ran a search in the bibliographical databases Scopus and Web of Science, with the search terms “Marketing Finance”, “Finance Marketing” and “Financial Marketing”, in the title, abstract or keywords, written in English, with a time frame until April of 2023. The search terms used in the database searches resulted from a set of preliminary readings we made of 67 articles we had already studied. We focused only on peer reviewed published papers. Conference proceedings, book reviews, etc. were not considered in the analysis. Initially, in Scopus we found 471 articles and in Web of Science we found 324. We used the Endnote20 software's duplicate identification tools, and of the 862 articles loaded, the software selected 626 articles after identifying and excluding duplicate items. Then we carried out a manual analysis of the selected articles and identified a set of duplicate articles that had not been automatically excluded. After manual exclusion of duplicate articles, 540 articles remained.

In the second selection phase, we analyzed the abstracts of the 540 articles and applied the grid that we had previously presented to select the studies that met the characteristics to be included in the literature review. Thus, works that did not have an abstract available or that the reading of the abstract required its exclusion for violating the rules defined for the selection were excluded. By applying the selection grid, the 134 articles that met the characteristics defined for the literature review were selected.

Next we present the flowchart Figure 1 that was designed in PRISMA Flow Chart Diagram developed by Haddaway et al. (2022) to summarize the procedure for paper selection and analysis.

Figure 1 - Flow chart for studies selection



The selected papers were subjected to bibliometrics analysis. As defined in the methodology and in order to answer the research questions, we used Bibliometrix R tool to science mapping our database. Science mapping is a valuable tool for systematic literature reviews, as it allows researchers to visualize the structure and relationships of scientific literature. Through bibliometric techniques such as citation, collaboration and co-word analysis, patterns and trends in the literature can be identified. This allows researchers to quickly identify key areas of research, as well as gaps and overlaps in the literature, as well as the influential authors and works in a particular field. Moreover, the map can indicate emerging trends and provide researchers with a means of staying

up to date with the latest developments. Science mapping is thus a powerful tool for marketing and finance researchers undertaking systematic literature reviews.

2.8. Data Analysis

2.8.1. Descriptive Analysis

Descriptive analysis involves summarizing and organizing data to gain a better understanding of what we collect. It is used to describe patterns and helps to understand the context of the data and the relationships among the various elements. In the case of bibliographic databases, it helps to identify the distribution of publications about a specific topic or topics to understand the current state of knowledge about a topic and the trends in research. We are going to present a source analysis, authors production analysis, annual scientific production, and most cited references from our data collection.

2.8.2. Sample overview

Source analysis is a form of data analysis that involves examining the source of the data and understanding the context in which the information was collected. We can see a summary in Table 3 - Principal Sources. It also involves assessing the accuracy, objectivity, and reliability of information sources. In the context of bibliographic databases, it helps to assess the credibility and accuracy of sources used in bibliographic records, such as paper titles and authors. In this case we have 52 sources and three represent 41,04% of all selected papers: Journal of Marketing (21,64%), Journal of the Academy of Marketing Science (11,19 %) and International Journal of Marketing with (8,21%).

Table 3 - Principal Sources

Sources	Articles	%
Journal of Marketing	29	21,64%
Journal of the Academy of Marketing Science	15	11,19%
International Journal of Research in Marketing	11	8,21%
Journal of Marketing Research	8	5,97%

Journal of Business Research	6	4,48%
European Journal of Marketing	4	2,99%
Marketing Letters	3	2,24%
Marketing Science	3	2,24%
International Journal of Bank Marketing	2	1,49%
Journal of Brand Management	2	1,49%
Other (42 Sources)	51	38,06%

This study is useful in understanding the contribution authors make to a particular field of study, as well as the extent of their influence which is summarized in Table 4 Most prolific authors. An analysis of a bibliographic database was conducted to identify the most prolific or influential authors in certain topics, resulting in 270 authors being identified. The following table presents those authors who are involved in two or more papers.

Table 4 Most prolific authors

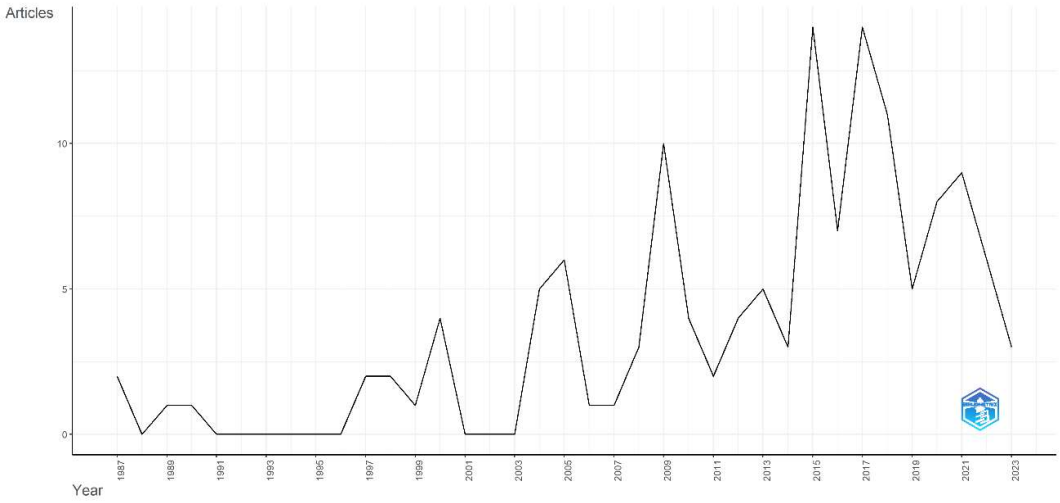
Authors	**Articles**	**Authors**	**Articles**
LUO X	9	LEHMANN DR	2
HANSSENS DM	8	BHARADWAJ SG	3
PENNINGS JME	4	SKIERA B	3
TULI KR	5	WIES S	3
HOFFMANN AOI	4	SRINIVASAN S	3
HOMBURG C	4	BENDLE NT	2
MANI S	2	CURRIM IS	2
ZINKHAN GM	3	MINTZ O	2

2.8.3. Annual scientific production

In this analysis we examined the output of scholarly articles in a particular time period. This type of analysis can help to identify trends in research topics, frequency of publication, and other related characteristics that is presented in Figure 2 - Annual Scientific Production. In the context of a bibliographic database, annual scientific production analysis can help to understand how much research has been conducted over a period of time. It can also help to identify the impact of the research produced over the years as well as any trends in research focus.

We identified a biannual pattern with a higher number of papers being published every two years. Such increase in the number of papers can be explained by the overlap with the biannual conferences known as the 'Marketing Strategy Meets Wall Street'. When we compare the conferences dates, we find that after the first conference in 2009, the years in which there was the highest number of articles coincided with the years of the conferences in Atlanta (2009), Boston (2011), Frankfurt (2013), Singapore (2015), San Francisco (2017), and Fontainebleau (2019). Concerning the year 2022, the data was influenced by the COVID-19 pandemic that the world faced.

Figure 2 - Annual Scientific Production



2.8.4. Most cited references

An analysis of citations is an important part of performing a literature review as it provides insight into the impact and influence of a particular paper or research project in its field or discipline. By examining the number of citations and the sources that cite a scholarly article, it is possible to gain an understanding of its wider impact. This analysis can also help to reveal new ideas or theories, as well as sources that are finely related to a research topic. Thus, analyzing citations is an important part of the literature review process in order to uncover the wider context and relevance of a particular paper or research project.

When we analyzed the works that constitute this literature review, we found that the 134 works accumulated 7,512 citations in total. Ten works had no citations yet, and the 10 most cited works accounted for 46.73% of all (7,512) citations. The following Table 5 Most Cited Papers presents the 25 most cited works identifying, source, total global citations, and number of citations per year. Gupta et al. (2004) work is the most cited (675 citations); however, X. M. Luo and C. B. Bhattacharya (2009) work has the highest number of citations per year (36,20).

Table 5 Most Cited Papers

Paper	Total Citations	TC per Year
GUPTA S, 2004, J MARK RES	675	33,75
RUST RT, 2004, J MARK	602	30,10
FORNELL C, 2006, J MARK	547	30,39
LUO X, 2009, J MARK	543	36,20
SRINIVASAN S, 2009, J MARK RES	418	27,87
JOSHI A, 2010, J MARK	269	19,21
GERMANN F, 2015, J MARK	233	25,89
LUO X, 2009, MARK SCI	223	14,87
MALTZ E, 2000, J ACAD MARK SCI	169	7,04
COLICEV A, 2018, J MARK	151	25,17
MORA CORTEZ R, 2017, IND MARK MANAGE	146	20,86
LEHMANN DR, 2004, J MARK	142	7,10
SORESCU A, 2017, J ACAD MARK SCI	132	18,86
JOSHI AM, 2009, MARK SCI	125	8,33

LUO X, 2010, J MARK RES	124	8,86
KERIN RA, 1998, J ACAD MARK SCI	124	4,77
HANSSENS DM, 2016, J MARK	122	15,25
ROSS SA, 1989, J FINANC	111	3,17
MINTZ O, 2013, J MARK	108	9,82
HOMBURG C, 2014, J MARK	102	10,20
BHARADWAJ SG, 2011, J MARK	92	7,08
BHAGWAT Y, 2020, J MARK	90	22,50
KUMAR V, 2005, J ACAD MARK SCI	88	4,63
HANSSENS DM, 2009, J MARK	87	5,80
EDELING A, 2016, J MARK RES	85	10,63

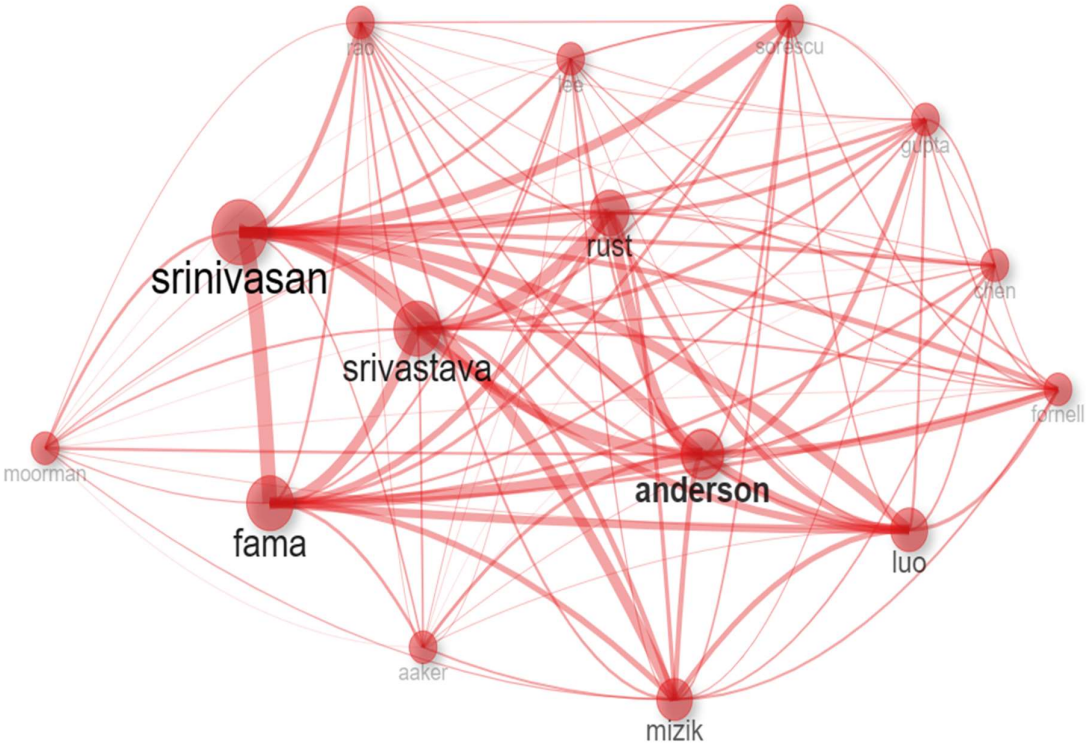
2.9. The Citation Analysis

Citation analysis is a classic technique in bibliometrics that can be used to understand the structure of a specific field. This method involves examining the linkages between nodes such as authors, papers, and journals (Aria & Cuccurullo, 2017). There are three main types of network structures: co-citation, direct citation, and bibliographic coupling. In this study we use Co-citation and Direct citation to analyze this parameter.

2.9.1. Co-citation analysis

Co-citation networks can be used to examine the relations between cited-reference works, cited-journals, centrality and peripherality of nodes, proximity and distance, strength of ties, clusters, and bridging contributions. Co-citation is an important part of a co-authorship network because it helps to identify connections and correlations between authors and their work. Co-citation analysis involves analyzing how often two authors' papers are cited together in a third-party paper, which can help show the strength of their connection. Co-citation analysis is also an important tool for assessing the impact and influence of specific authors. By examining the number and frequency of co-citation, it is possible to assess the relative impacts of different authors' research and the overall importance of a particular research topic. In Figure 3 we identified some interesting interconnections, between marketing and finance scholars, and the most co-cited works.

Figure 3 - Co-citation map analysis



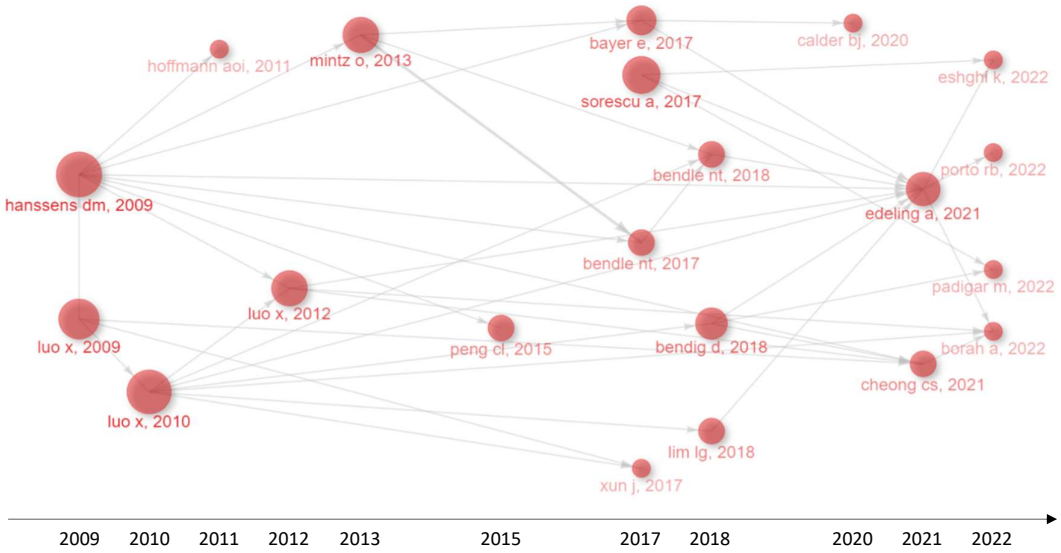
The map identifies three central works in the process of co-citation: Srinivasan and Hanssens (2009), Srivastava et al. (1998) and Anderson and Mansi (2009), accompanied by Fama (1970) and Rust, Ambler, et al. (2004). It is worth mentioning that Fama, an author in the field of finance, is cited together with well-known authors in the marketing field. This evidence demonstrates the relationship between both areas of knowledge - finance and marketing - which have converged to create this new field of research Marketing Finance.

2.9.2. Direct citation

Direct citation helps to identify links between authors and their research over time. Direct citations involve the citing of one article or research project within another, which can indicate the influence or importance of one piece of work within a specific field. By analyzing the links between authors and their cited work, it is possible to gain insight into the relationships between different research projects and to understand how the work of one author or group of authors has had an impact on

a field. The size of the circle around each work in Figure 4 shows how often it's cited. This method helps us pinpoint key sources shaping the field.

Figure 4 - Direct citation map analysis

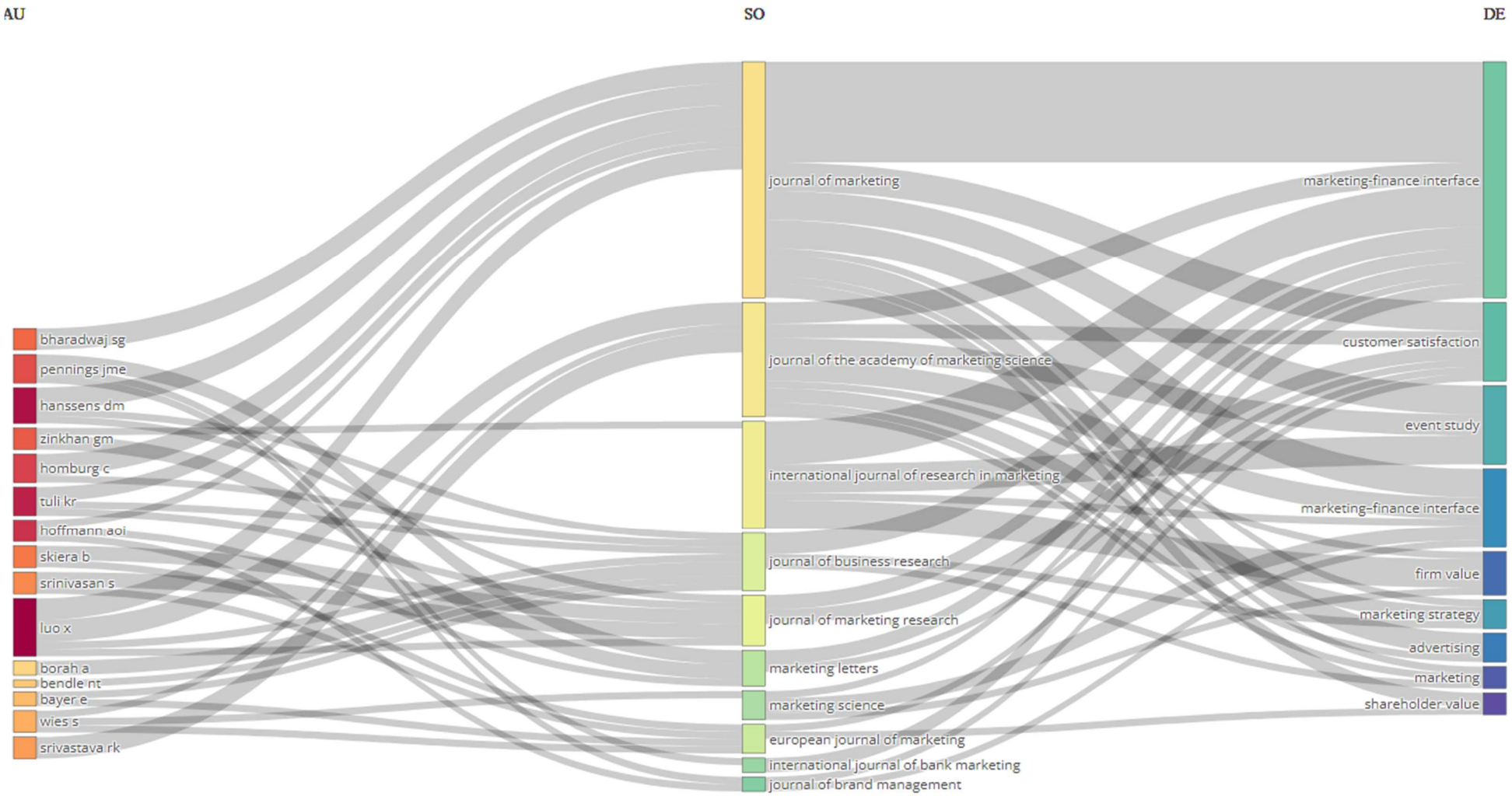


Srinivasan and Hanssens (2009) work, which defines key concepts in this research field, remains widely cited until present day. Luo Xueming studies in (2009), (2010) and (2012) on the effects of marketing on firm value follow, along with Mintz and Currim (2013) examination of marketing metrics are other consistently cited papers. Edeling et al. (2021) literature review encompasses all of these works, and her own contributions are cited in subsequent research, underscoring her significance to the field of marketing finance.

2.10. Principal Authors, Sources and Keywords

The graphical representation in Figure 5 - Three-Field Plot provides a comprehensive understanding of the dynamics among authors, sources, and keywords during the period under examination. This map offers an initial overview of the most relevant terms (authors' keywords) from the studies encompassed in this literature review, including the marketing-finance interface, customer satisfaction, event study, firm value, marketing strategy, advertising, and marketing and shareholder value. It further highlights the journals that have made substantial contributions to this research arena, elucidating the predominant research streams and the distinguished authors affiliated with each journal. Examining the Figure 5, it becomes apparent that there are 15 authors, 10 journals, and 8 key concepts that significantly contribute to the scientific production in the field of marketing finance, along with their respective relationships. The Journal of Marketing, the Journal of Academic Marketing Science, and the Journal of International Research in Marketing cover the eight concepts identified. In a more detailed analysis, the marketing-finance interface concept is the most studied, present in two periods and also associated with two different clusters: Marketing Finance Interface to Value and Marketing Finance Interface to Information. In reality, this concept is associated with marketing metrics, i.e. how we are going to value marketing activities, but it also addresses another concept that involves studying the analysis of the centrality of marketing to value the company as a market asset.

Figure 5 - Three-Field Plot



2.11. Factorial Approach - Factorial Analysis

Factorial analysis is a valuable statistical technique in conducting a literature review as it helps researchers to uncover the underlying patterns and factors that explain a set of observed variables. It allows for a systematic exploration of the data, provides insights into the underlying structure. Applying this technique to our data, we identified the closeness of several groups of terms: namely, advertising, brand value, customer satisfaction, event study, finance, financial performance, firm value, marketing, marketing-finance interface, marketing accountability, marketing strategy, shareholder value, stock returns. To conduct a factorial analysis on our sample, we defined six clusters and 15 terms as parameters. We employed the Correspondence analysis methodology and selected author keywords as the fields of search. This analysis resulted in the aggregation of 29 terms divided into six clusters.

2.11.1. Factorial Analysis Approach - Word Map

This analysis establishes the clustering of these terms and arranges them hierarchically based on the data from the sample. From this analysis, we can conclude that the articles comprising this literature review identify six major research themes. As represented in Figure 6 - Factorial Analysis Approach - Word Mapresulted in the creation of six clusters, each represented by a distinct color and organized hierarchically.

The first cluster comprises the terms Marketing Metrics, Marketing Accountability, Brand Value, Marketing Finance-Interface, Stock Risk, Brand Equity, Stock Market Valuation, and Event Study. We call this cluster Marketing Finance Interface to Value because it includes articles that examine how the marketing finance interface increases the company's value in the market.

The second cluster of Marketing Strategies to Value consists of the terms of marketing strategy, financial performance and firm performance, this cluster brings together the articles that study the marketing strategy to increase the value of the firm.

The third cluster, Marketing Finance Interface to Information, comprises articles that present the marketing finance interface as a reporting tool. This cluster is gaining prominence with the integration of Artificial Intelligence (AI) into marketing processes. As AI emerges as a significant tool for engaging with investors, it also establishes itself as a novel touch point. The fourth cluster is composed of the terms Investors, Finance, and Marketing. The fourth cluster Marketing to Investors Valuation comprises the terms Investors, Finance, and Marketing. This cluster includes articles that examine the relationship between marketing processes and improving the relationship with investors to increase the company's value. Some articles (Edeling & Fischer, 2016; Edeling et al., 2021) in this cluster investigate the behavior of individual investors in response to marketing activities. The fifth cluster Marketing Efficiency to Value encompasses the terms Efficiency and Return on Marketing Investment this cluster includes articles that examine the relationship between efficiency of marketing and return on marketing investments. The sixth cluster Marketing management to Value includes the terms Market Value and Marketing Management and encompasses papers that study the marketing management dimension on firm value.

Figure 6 - Factorial Analysis Approach - Word Map



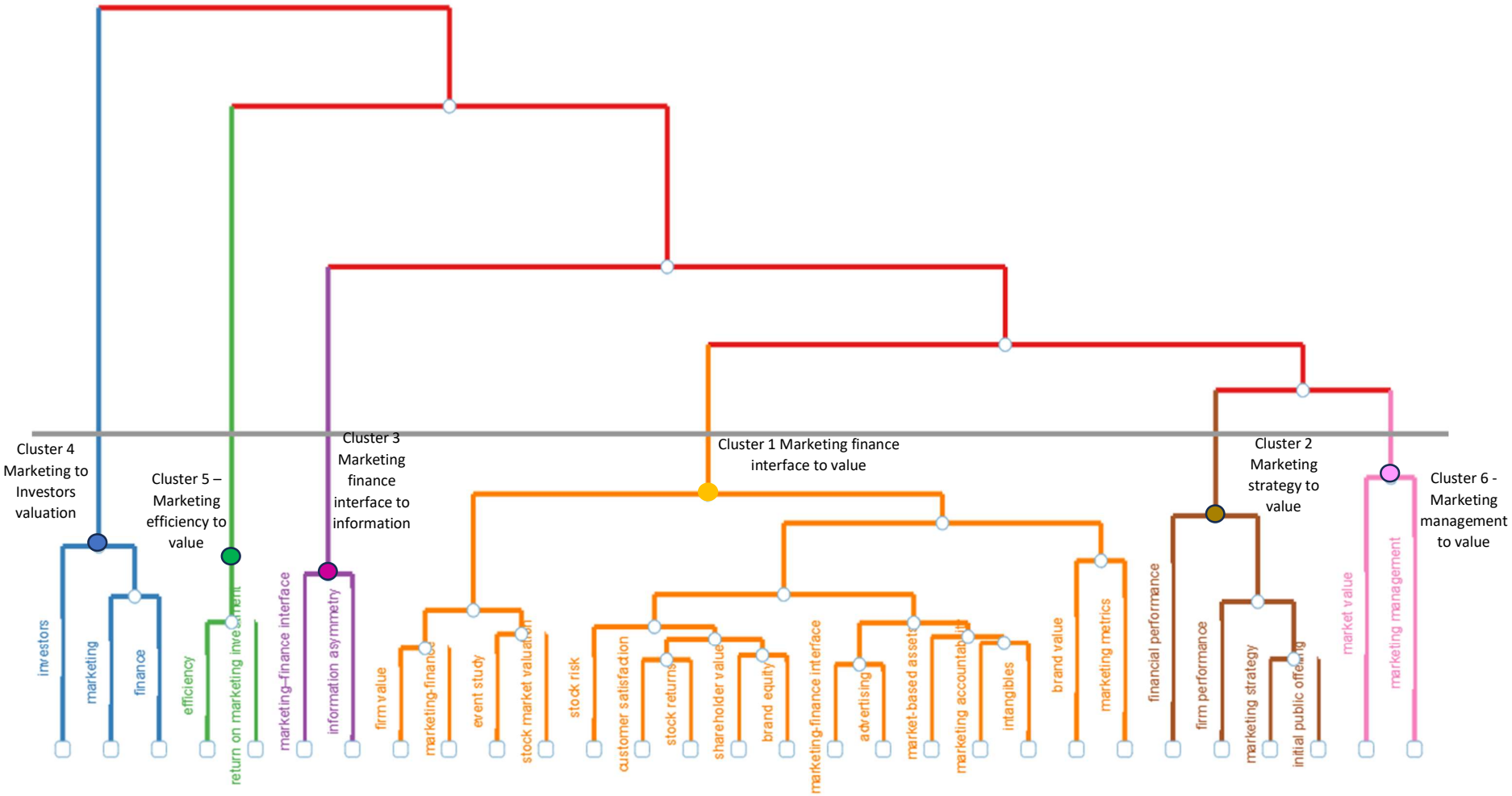
2.11.2. Cluster analysis of our sample

We complemented the previous analysis witrh the topic Dendrogram, which provides a visualization of the structure and relationships among a set of documents or research papers. It is a hierarchical diagram that shows the clustering or grouping of documents based on their similarity in terms of citations, keywords, or other bibliographic data. The dendrogram output in bibliometrix provides a visual representation of the hierarchical clustering of papers. It shows the branches or clusters of documents and the subclusters within each branch. The height of the branches represents the distance or dissimilarity between documents. Documents that are closer to each other are more similar in terms of their bibliographic characteristics.

Analyzing the dendrogram can provide insights into the structure and patterns within the document set. It can help identify clusters of related documents and determine the main research themes or areas of interest in the literature. Researchers can use this information to gain a better understanding of the existing knowledge landscape, identify research gaps, and explore potential collaborations or research directions.Figure 7 – Cluster analysis of our sample presents the dendrogram generated from our sample using the previously defined methodology for factorial analysis with 29 terms and six clusters.

The dendrogram shows the associations and positioning of the clusters based on their proximity. Upon analyzing the map, we observe that cluster 4, which focuses on the relationship between marketing and investors from a financial perspective, is closely located to cluster 5, which examines efficiency and return on marketing investment, and relatively close to cluster 3, which explores information asymmetry. On the other hand, cluster 4 is more distantly positioned from cluster 6, which investigates the relationship between market value and marketing management. Cluster 1 occupies a central position and is equidistant from the other five clusters.

Figure 7 – Cluster analysis of our sample



2.12. Trend Topics

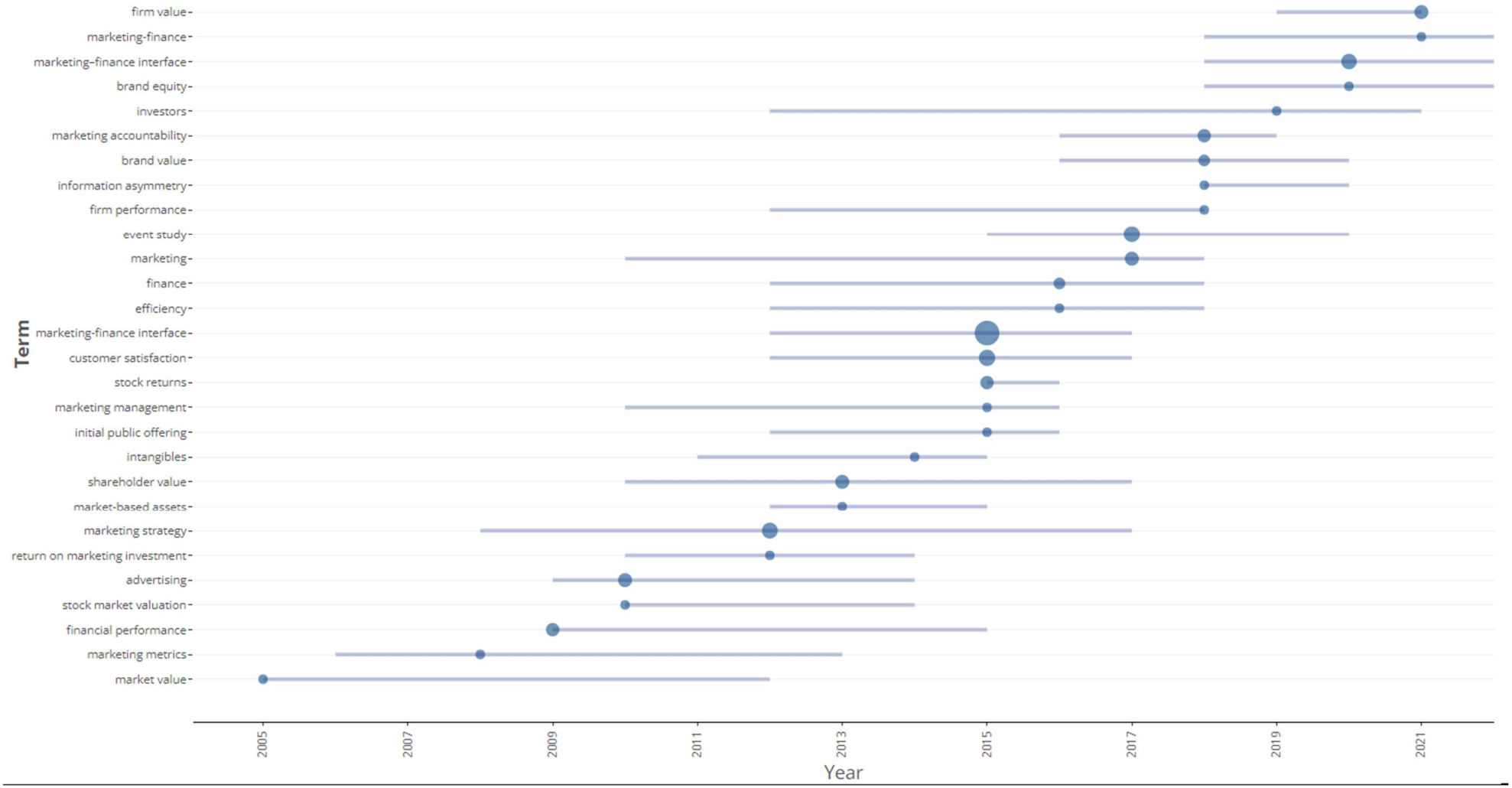
Concerning the trends in topics, we analyze the temporal evolution of concepts. Figure 8 -Trend Topicsreports the significance of each term and its prominence at different points in time. The x-axis signifies the time of publication of the papers, while the y-axis represents authors' keywords. This arrangement facilitates the examination of trends and [4]patterns within the research literature, as it is based on the terms associated with each paper. For the purpose of generating this output, the search term was defined as authors' keywords, and specific parameters were set, including a word minimum frequency of 3 and a requirement of at least 5 words per year.

Analyzing this graphical representation, we can see an evolution over time. However, there are certain noteworthy considerations to be made. For instance, the term "marketing finance interface" appears in two distinct periods since it does not consistently appear in the authors' keywords throughout the entire timeframe. Initially, the focus was primarily on "market value" and "marketing metrics," whereas current terms center around "firm value," "marketing finance interface," "brand equity," "investors," and "marketing accountability."

A closer examination of the relative importance of the search terms, indicated by the diameter of the circles, reveals the following influential terms: "firm value," "marketing finance interface," "event study," "customer satisfaction," "stock returns," "shareholder value," "marketing strategy," "advertising," and "financial performance." These insights provide valuable information for our analysis of the evolution of marketing finance concepts.

[4]

Figure 8 -Trend Topics



2.13. A time journey on the study of marketing finance

The term marketing finance has been present in literature since the 70s of the 20th centuries. The initial works in the field of marketing finance focused on promoting coordination and knowledge between the marketing and finance departments of companies. Evidence of this can be seen in the works of Nakagawa (1978) and Kirpalani and Shapiro (1979) which we identified during our research. However, it is from the end of the 80s that the two worlds of marketing and finance have begun to work together, joining in a body of research two different ways of thinking about business management. Over time, new themes emerged (valuing customers, customer satisfaction, shareholder value approach, marketing productivity, brand quality, brand equity, brand value and value of marketing), leading to the choice of the title for this study "From friends to the individual investor ". As we will see, there has indeed been a progression of concepts studied in marketing finance. Nowadays, the emerging concepts are different and primarily focus on the relationship with the investor.

In order to outline the historical progression of marketing finance concepts, this section will delineate three distinct periods. The first period encompasses the initial emergence of studies on marketing and finance, up until 2004 when the Journal of Marketing published a special issue that laid the foundation for future advancements at the intersection of these two disciplines. The second period, spanning from 2004 to 2010, signifies the establishment of marketing finance as a distinct field of study and investigates various concepts during this timeframe. Lastly, the third period encompasses the years 2010 to the present day, in which a broader range of topics is covered and a notable transition occurs from a focus on the firm market value to a focus on individual investors.

2.13.1. The first period until 2004

The evolution of marketing finance is shaped by pivotal studies that highlight the potential for harmonization between marketing and finance departments, hinting at the promising outcomes from fostering collaboration and understanding within firms (Frommelt et al., 1987). This potential magnified the belief in the value of conducting integrated analyses across these disciplines to unlock new avenues for corporate benefit (Ross, 1989).

The term "marketing finance interface" emerged as a defining concept in the literature, indicating a period of more purposeful engagement between marketing and finance, aimed at elevating collective understanding (Ratnatunga et al., 1990). Questions about the effectiveness of R&D and advertising investments challenged preconceived notions regarding their influence on extraordinary profits, triggering a reassessment of their strategic value (Erickson & Jacobson, 1992). A comprehensive evaluation of the intersection between marketing and finance unveiled seven critical themes; a) managing the functional interface between marketing and finance; b) satisfying the conflicting demands of various stakeholder groups; c) business reaction to government regulation; d) managing risk; e) the impact (if any) of marketing expenditures on shareholder wealth; f) gender differences and their influence on the organization; and g) appropriate methods for business research. These themes influence the robustness of the relationship between marketing and finance, spanning from management practices to the scrutiny of marketing investments in the context of shareholder worth (Zinkhan & Christian Zinkhan, 1997). The connection between brand equity and shareholder value was scrutinized, uncovering a substantial alignment between accumulated brand value and corporate financial performance (Kerin & Sethuraman, 1998).

A conceptual model has been proposed, which focuses on the marketing-finance interface and advocates the use of market-based assets to increase shareholder returns, improving cash flow

indicators and mitigating financial risks (Srivastava et al., 1998). The combination of financial and marketing perspectives offered a novel approach to evaluating the viability of financial services products such as futures contracts (Pennings et al., 1999). Research delved into the factors fostering friendly relationships between marketing and finance departments, highlighting the value of cooperation and shared goals (de Ruyter & Wetzels, 2000). Mechanisms to reduce conflicts across diverse business units were considered, promoting improved integration among marketing, finance, manufacturing, and R&D operations (Maltz & Kohli, 2000).

At the end of the second millennium of our era we observed a deepening of the interface between marketing and finance research that shed light into their dynamic interplay at the heart of strategic business decision-making. Such perspective reinforces the pivotal role of this dual focus in shaping business practice and theory (Zinkhan & Verbrugge, 2000). These insights collectively paint a rich narrative of the intricate evolution of marketing finance concepts, echoing through academia and industry alike.

2.13.2. The second period from 2004 to 2010

In January 2002, Donald R. Lehmann, Executive Director of the Marketing Science Institute, submitted a proposal for a special section in the Journal of Marketing titled "Linking Marketing to Financial Performance and Firm Value". The AMA and the MSI - Marketing Science Institute joined forces to cosponsor the special section and foster collaboration between marketing academics and practitioners to advance research in this area. This vision was realized in 2004 when Donald Lehmann edited a special issue of the Journal of Marketing, laying the groundwork for future advancements at the intersection of marketing and finance. Subsequently, in 2006, the MSI/EMI venture was responsible

for the funding of numerous research projects, which were published in a Special Section of Journal of Marketing in November 2009. Furthermore, the Marketing-Finance Initiative also gave rise to a sequence of biennial conferences, known as the 'Marketing Strategy Meets Wall Street Conference', which have been held in Atlanta (2009), Boston (2011), Frankfurt (2013), Singapore (2015), San Francisco (2017), Fontainebleau (2019) and Chicago (2022). Lehmann (2004) presented a figure in his work (Table 6 - Marketing Finance productivity chain) that highlighted the focus that traditional marketing had up to that point. We adapted his work and added a column intitled **Marketing finance concepts** that put in emphasis the concepts that arise from this study.

Table 6 - Marketing Finance productivity chain

Company Viewpoint	**Level**	**Who Cares?**	**Marketing finance concepts**
We do stuff	Marketing actions	Customers	Brand value
	⇩		⇩
Customers do stuff	Customer reaction	Advertising and promotions specialists	Customer satisfaction
	⇩		⇩
Stuff happens	Product-market impact	Product managers and chief marketing officer	Marketing finance interface
	⇩		⇩
Accounting happens	Financial outcomes	Chief marketing officer and chief financial officer	Equity value
	⇩		⇩
Wealth is affected	Firm value	Chief financial officer and chief executive officer	Shareholder value

Adapted from Lehmann (2004)

The narrative of marketing finance research regains a close examination of the financial value of a firm and its reliance on intangible assets, proposing customer lifetime value as an alternative method to

assess firms with negative earnings (Gupta et al., 2004). The aim of marketing finance is articulated as a tool to amplify the market value of shares by highlighting the firm's growth opportunities (Hägg & Preiholt, 2004). A proposed framework to assess the influence of marketing expenditures on shareholder value stimulates debate and indicates new research paths to refine the assessment of marketing productivity (Rust, Ambler, et al., 2004).

The impact of marketing on stock market metrics becomes a focal point, with research proposing diverse modeling methods to track this financial influence, discovering a notable link between marketing activities and stock returns (Lovett & MacDonald, 2005). A customer-centric framework emerges, using marketing strategies as a vehicle to maximize a firm's financial performance (Kumar & Petersen, 2005). A proposition of five contributions from a shareholder value viewpoint to marketing lays the groundwork for future analysis (Lukas et al., 2005, pp. 416-418): "(1) Helps marketing properly define its objectives; (2) Provides the language for integrating marketing more effectively with other functions of the business; (3) Allows marketing to demonstrate the importance of its assets; (4) Protects marketing budgets from profit-maximization policies; (5) Puts marketing in a pivotal role in the strategy formulation process".

The tangible connection between customer satisfaction and a firm's market value of equity becomes evident, suggesting that investments in firms with higher customer satisfaction indexes might deliver excess returns (Fornell et al., 2006). Merging marketing effectiveness and financial discipline is advocated as a strategy to increase shareholder value (Jagpal & Jagpal, 2008). New approaches by which marketing can assist in creating shareholder value are proposed, along with the notion that mindful attention to pre-IPO marketing expenditures could guide investors in identifying successful IPOs (Luo, 2008).

Complaints from customers can significantly affect a company's stock value. This impact is greater than the influence of customer satisfaction on the stock value gap, finding that complaints have a more pronounced impact compared to customer satisfaction (Luo & Homburg, 2008). Shareholder Value Analysis (SVA) is presented as an instrument enabling smoother coordination between marketing and finance to the advantage of all stakeholders (Sidhu & Roberts, 2008). The interface between marketing and finance is explored through corporate social performance and its impact on firm-specific risk, emphasizing the role of strategic marketing levers such as advertising and R&D (X. Luo & C. B. Bhattacharya, 2009).

The notion that market reactions to public relations efforts require fundamental backing is defended, while the empirical link between marketing and firm value is explored, examining possible biases in investor responses (Srinivasan and Hanssens (2009);Karniouchina et al. (2009)). A focus group study maps out relationships between marketing actions and firm value creation, identifying five primary areas for research (Hanssens et al., 2009). The long-term adverse consequences of negative word-of-mouth on a firm's financial well-being, indicating the potential occurrence of a negative spiral effect (Luo, 2009).

The repercussions of low customer satisfaction on debt costs and credit ratings are analyzed (Anderson & Mansi, 2009). A reexamination of how financial markets price customer satisfaction is presented (Jacobson & Mizik, 2009). Advertising's impact on investors is discussed, independent of its tangible consumer effects (Joshi & Hanssens, 2010). The implications of customer satisfaction on stock analysts' recommendations and respective firm value metrics are further assessed (X. Luo et al., 2010).

2.13.3. The third period from 2011 to present

Perceptions of brand quality and earnings are correlated, with findings indicating that investor sentiment turns negative when there are decreases in current-period earnings (Bharadwaj et al., 2011). The benefits of managing investor relations as a market-based asset are expounded, emphasizing its impacts on capital market dynamics (A. O. I. Hoffmann et al., 2011). A critique against a narrow focus on the marketing-finance interface is defended, advocating for a broader, triadic lens that includes community alongside marketing and finance (Cova & Paranque, 2012).

It is debated that high levels of customer satisfaction protect firms against stock price corrections after periods of intense investor sentiment (Merrin et al. (2013). The significance of the context in which managers operate over their inherent characteristics regarding their use of metrics is highlighted, linking the use of financial and marketing metrics to the performance of marketing-mix activities (Mintz & Currim, 2013). New insights emerge about how investments in customer satisfaction may enhance firm value, with an emphasis on communication strategies about customer satisfaction to prompt optimal investor responses (Luo et al., 2014).

The effects of channel expansion announcements on firm value are studied, accounting for firm-specific, market, and channel strategy contingencies (Homburg et al., 2014). In the gaming industry, the economic value of a pre-registration event for a new game launch shows positive effects on future cash flows, with the influence being more pronounced for smaller firms, suggesting investor recognition of innovative capabilities (Min & Oh, 2015). The significant role of customer satisfaction as an intangible asset in capital markets, particularly in time of crisis, is emphasized, as companies maintaining or increasing intangible investments witness protection from negative sentiment and enjoy the benefits of the created intangible value (Peng et al., 2015).

The interplay between financial leverage and marketing outcomes upon firm value is scrutinized, revealing how debt pressures can precipitate short-term marketing decisions detrimental to customer satisfaction (Malshe & Agarwal, 2015). The utility of analytics in improving marketing decisions and identifying knowledge gaps for research to enhance marketing efficacy and value demonstration is discussed (Hanssens & Pauwels, 2016). A meta-analysis corroborates the proposition that strategic marketing-mix decisions are recognized positively by the stock market and can influence financial outcomes (Edeling & Fischer, 2016). The disparity between the economic significance of business-to-business B2B transactions and their coverage in marketing research literature is addressed, identifying six vital research avenues to align scholarship with practitioner needs more closely, Innovation, Customer Journey and Relationship Value, Data Analytics, Harnessing Technology, Marketing/Finance Interface and Revenue Growth, and Industry Context or Ecosystem. They argue that Wall Street does not understand where real value is created (Cortez & Johnston, 2017).

The interconnection between social media and shareholder value is investigated, with consumer mindset metrics serving as a tool to discern positive financial outcomes (Colicev et al., 2018). Share buybacks juxtaposed with marketing investments are scrutinized, pointing to investor disfavor toward firms engaging in share repurchasing alongside marketing myopia (Bendig et al., 2018). Corporate sociopolitical activism is dissected for its effects on stakeholder values and brand image, with insights into how it influences investor and customer reactions (Bhagwat et al., 2020). Marketing excellence's significance for investors is revealed, with portfolios centering on marketing excellence generating notable abnormal returns (Homburg et al., 2020). Customer satisfaction's negative impact on future cost of selling is discussed, alongside the industry-specific, strategic, and operational factors that mediate this effect (Lim et al., 2020).

The influence of firm marketing actions on investor attention to a firm's stock is examined, indicating that investors consider a firm's and its competitors' marketing information in a more intricate manner than previously thought (Borah & Skiera, 2021). The implications of leveraging customer voice in managerial decision-making are studied (Saxena et al., 2022).Finally, innovation imprinting strategies are examined for their positive impacts post-IPO, attracting risk-tolerant investors who appreciate the possibilities offered by firms adept at managing the risks of innovation (Wies et al., 2023).

2.14. Setting a research agenda for marketing finance

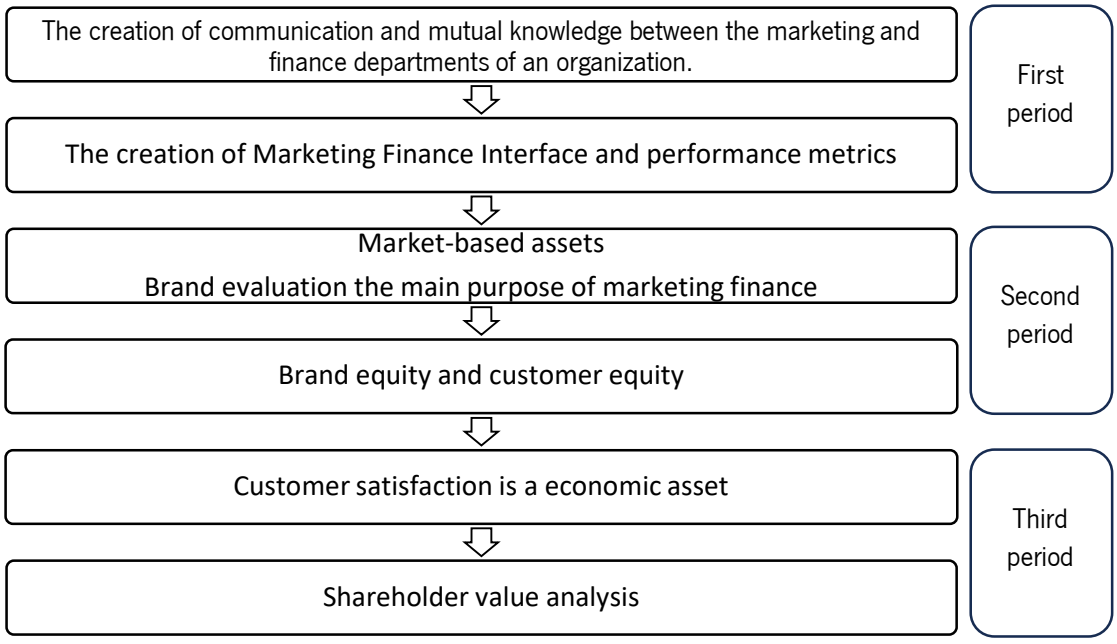
At this point of our work, it is important to revisit the research question and compare with the findings that we uncover with this study. Our research question was: **How research in marketing finance has evolved over time and its implications for practical applications**? And with that we set four objectives:

The first objective was **to provide a in-depth understanding of the historical development research in marketing finance**. From what we present the research in marketing finance evolve over time and from de initial times when the primary reason for research was studying the relationship between two different departments from the same firm, Marketing and Finance to nowadays when the focus is on the communication and perception of marketing actions can improve shareholder value.

In particular, by analyzing the evolution of the study of marketing finance over time (Figure 9), we concluded that there is a temporal gradation of the importance of concepts. Although since almost the beginning several concepts appeared, their prevalence has been different over time. At the start, the first stage, the big question was the study of the relationship between the two departments within the same organization. Marketing and finance.

We can infer that marketing finance is born from the need for an articulated communication and an integrated strategy between these two departments. The second stage creates the concept of the marketing finance interface and focuses on creating metrics to financially evaluate marketing actions. This field of study remains relevant up to this day. The third phase focuses on brand valuation as the principal focus of marketing finance, and various work arises to study this relation from different perspectives. The fourth phase develops with the creation of the concepts of brand equity and customer equity, closely related to CLV Customer Lifetime Value (Gupta and Zeithaml (2006); Kumar and Reinartz (2016). The fifth stage goes through the definition of customer satisfaction as an economic asset. In the sixth stage, the emphasis is on the relationship between the company and its shareholders. By understanding how the company's value can be increased through favorable evaluation by shareholders and how marketing can mediate this relationship.

Figure 9 - Marketing finance evolution stages



The second objective **identify the primary focuses and key areas of research in marketing finance.** Over time, the main themes were perennial in this field of research, the marketing finance interface, customer satisfaction, shareholder value, firm value, brand equity and brand value prevail in many scholarly studies in this field of research. But in general, we observe a shift from the subject to the individual. Nowadays the focus is on the individual with more and more prominence and presence of technology in all processes.

The relationship between the behavior of individual investors and the role of marketing in influencing their decision-making processes has been investigated in recent papers (Sorescu et al., 2017; Edeling et al., 2021). These authors shed light on the subject by exploring the intersection of individual investor behavior and marketing strategies. In light of this, the present literature review underscores the necessity for further exploration of individual investor behavior, specifically in the context of emerging trends in capital markets. Upon revisiting our cluster analysis, we observe that two clusters are directly associated with this line of research Cluster 3 Marketing finance interface to information and Cluster 4 Marketing to Investors valuation.

The third cluster Marketing finance interface to information delves into the connection between information and the marketing finance interface, specifically focusing on the evaluation of information. Meanwhile, the fourth cluster Marketing to Investors valuation explores the correlation between marketing and financial metrics, establishing a direct linkage between marketing activities and investors. It is evident that there exists a research gap in the examination of this particular area, highlighting the need for further investigation and comprehensive understanding of this stream of research This literature review further highlights the critical need for **exploring individual investor behavior**, particularly within the context of the growing prominence of individual investors in capital

markets. It is vital to undertake novel research endeavors that explore these themes, thereby apprehending the progression of marketing finance concepts from a social and behavioral standpoint.

The third objective reports the specification of **explore the future research questions and potential areas for growth in the field of marketing.** The rapid advancements in technology have exerted a profound influence on various aspects of society, including the field of marketing finance. In light of the increasingly interconnected global landscape, **it is imperative to scrutinize how Artificial Intelligence (AI) has influenced the dynamics of marketing finance**. AI holds the potential to revolutionize financial markets through task automation and more precise predictions and analyses. Furthermore, the global population is undergoing significant demographic changes, such as population aging. This trend has implications for investor behavior, as **older individuals may have different financial needs, risk preferences, and investment strategies compared to younger generations**.

Moreover, the COVID-19 pandemic has ignited a novel inclination toward widespread homeworking, thereby disrupting established workplace dynamics. Such a shift carries consequential ramifications for marketing finance, given that **individuals may harbor different financial priorities and make altered investment decisions while working remotely.**

The forth objective the **assess the practical implications of the research findings in marketing finance**. We identified a list of works that are useful to practical scenarios, for example, the use of marketing-finance interface to measure the financial impact of marketing actions. Additionally, we uncovered the importance of investing in customer satisfaction, and the consequential increase in shareholder value such investments may bring. It is important to incorporate the

newcoming trends to the marketing finance concepts, as artificial intelligence, population aging and homeworking that emerged after the COVID-19 pandemic.

These nascent avenues of inquiry are poised to yield invaluable insights into the concomitant implications of technology, demographic shifts, and the expanding trend of homeworking on investor conduct and financial decision-making processes. By doing so, the elucidated knowledge will help inform the development of strategies and policies that effectively support individual investors in this evolving landscape.

2.15. Conclusion and research limitations

This study has provided a comprehensive review of the substantial body of research on marketing-finance concept over time. We studied 134 peer-reviewed published articles to analyze the evolution of our object of study, and its major concepts that have been developed to further understand this area of knowledge. We start to define the marketing finance definition and the context of the arising of this field of study. Notably, we found compelling evidence of the increased attention given to marketing finance research, with a growing number of publications in recent years. Moreover, there has been a shift in the focus of the research stream, with initial emphasis on the relations between the marketing and finance departments within a single firm, and more recently, on how marketing can lead to increase shareholder value, investor attention and firm value. We also showed how marketing-finance interfaces can be employed to measure this impact. This study therefore highlights the value of marketing finance research in understanding the complex relationships between marketing and finance and provides valuable insights into its current state and future developments.

The research on marketing finance provided a valuable insight into the complex relationship between marketing and finance. However, there are some limitations that should also be acknowledged. Firstly,

most of the studies focused on data from the United States, using the American Customer Satisfaction Index (ACSI) to measure customer satisfaction, making it difficult to extrapolate the conclusions to other cultures. Moreover, the diversity of cultures and the variety of responses to a marketing stimulus were not sufficiently accounted for in our study. As a future avenue of research, there is a need to address the shift that has recently occurred in equity investment from institutional to individual investors. This requires further research into the psychology and behavior of individual investors, in order to understand how marketing should be |adapted to address this new reality. Moreover, it would be important to analyze the different types of investments in different contexts and cultures, to better understand the impact of marketing strategies in different markets

3. The Individual Investor Journey

3.1. Abstract

This presents an empirical investigation on the decision-making process of individual investors, their influence on stock prices, and the link between their participation and stock price fluctuations, focusing on the commercial aviation sector in North America. Utilizing data from NYSE and NASDAQ throughout 2012-2023, involving 2.953 days of trading, the study conducts a comprehensive exploration of market trading conditions alongside investor sentiment. This research focuses on enlightening the relationship between market trading conditions and investor sentiment through a Vector Autoregression (VAR) model. Consistent with earlier research, the results revealed a statistically significant causality between increased investor attention and stock prices for three of the five companies studied. Moreover, we find a statistically significant positive relationship was also found between individual investor participation and stock price variations. This research offers valuable contributions to understanding the Individual Investor Journey and the intricate dynamics of capital markets and further emphasizes the increasing role of individual investors in such markets.

3.2. Keywords

Customer journey, investor journey, investor sentiment, individual investors, investor behavior

3.3. Introduction

The genesis of this study lies within the phenomena observed during the unprecedented rise of small investors rallying in defense of GameStop's stock. In essence, the company witnessed a meteoric surge in its stock price of over 1,700% between the end of 2020 and January 27, 2021. This drastic appreciation was a consequence of a concerted effort by individual investors on the renowned Reddit forum, r/wallstreetbets. Simultaneously, the company grappled with downwards pressure on its stock price resulting from short selling by institutional investors. The individual investors, however, turned the tide by orchestrating a short squeeze operation, triggering a surge in the stock price, thus inflicting substantial losses on the institutional investors (Kim et al., 2023; Zheng et al., 2022) . This operation disrupted the relationship between individual investors and the stock market. For the first time, individual investors have outperformed institutional traders, creating a new perspective for analyzing the stock market. This maneuver destabilized the conventional relationship between individual investors and the stock market. For the first time, retail investors were seen outperforming institutional traders, engendering a novel perspective for stock market analysis.

In recent years, particularly in light of global lockdowns during 2020 and 2021, international brokerage firms have seen an influx of millions of new investors entering the capital market Osipovich (2020). This prompts several important questions pertaining to the degree to which these new investors alter the dynamics of individual investors' influence in capital markets, and the anticipated market behavior under this new investor structure. This evolving power dynamic - the increasing role individual investors currently fulfill and are expected to play in the future - necessitates a more comprehensive exploration of the investor's journey and relationship with the stock market.

The classical model of the individual investor has seen significant transformation and now more closely resembles that of a consumer in some perspectives. Traditionally, individual investors capitalized their savings through professional financial intermediaries who provided advice and often decided on where those savings would be invested. However, in the current financial landscape, the decision-making process for buying or selling stocks has shifted towards a more independent process, with the individual investor often making decisions without the assistance of intermediaries.

This financial democratization is fueled by the creation of electronic trading platforms that directly connect individual investor's smartphones with the trading floors of financial markets. This has been accompanied by decreasing transaction costs, with low or even non-existent commission fees in some cases. The rise of social networks has further propagated the engagement of individual investors with the stock market. This research seeks to examine the impact individual investors are having on the global financial market, as well as on companies.

Investors have exhibited what can sometimes be perceived as irrational market behavior (Long et al. (2023). The relationship between investors and their investments is often not explained by financial logic. Studying this relationship between investors and their investments, and how companies can build a relationship with investors to retain them, is an area of research that should be analyzed from the perspective of the investor journey and how the company manages its shareholders. Currently, we have different groups of investors, and therefore we need to segment these investors, considering differences in capacity, skills, and attitudes over time (Morvan & Le Gall-Ely, 2021). To what extent can companies create mechanisms through relationship marketing strategies to create emotional ties between individual investors and the company's securities? That is the leitmotiv to endure this research.

In this study we examine the individual investor's security selection process from a journey perspective. This study's main contribution is to analyze the nuances of the process of pre-purchase, purchase, and holding of securities in an individual investor's portfolio as a journey that can be identified. Previous research has predominantly been based on the efficient market hypothesis, which suggests that the choice of a security depends on its impact on the portfolio in terms of increasing average return and/or decreasing variance and risk (Fama, 1970; Lo, 2018). However, this rationale is more relevant for institutional investors. Individual investors lack the resources and knowledge to assess securities in this way, and they are more affected from psychological inputs and relationship over time with a specific security (Barber & Odean, 2008).

To synopsize, this study intends to scrutinize whether the preponderance of individual investors concerning a specific stock influences the price of that stock, and vice versa. Furthermore, we aim to examine the degree of impact. Additionally, this research directs an analytical lens towards the correlation between Individual Investor Sentiment and the stock's price, questioning whether the fluctuation in a stock's price reciprocally affects the Individual Investor Sentiment. Ultimately, we will investigate the potential influence of Individual Investor Sentiment on the preponderance of individual investors within the market. This investigation serves as a pioneering study within this domain of research, striving to inaugurate a novel research stream dedicated to understanding preponderance of individual investor and the individual investor behavior.

3.4. Theoretical Background

In order to comprehend the fundamental concepts underpinning our study, we will begin by identifying the primary constructs, examining their relationships, and considering the existing literature on these

constructs. Our research will delve into Investor Sentiment and the prevalence of individual investors in the equity purchasing process. In this regard, we will scrutinize such key terms.

Investor sentiment is a metric representing the overall mood or outlook of investors concerning a particular security or broader financial market (Berger, 2022). It encapsulates the collective spirit, perspectives, and predispositions of investors towards investing in an explicitly defined entity or sector. In contrast, investor engagement embodies the degree of interest and involvement demonstrated by investors in an organization or industry. This engagement could be gauged through, for example, the involvement of the individual investor in social media (Bouteska et al., 2023). A potential intersection between investor sentiment and investor engagement might emerge when the generalized investor mood or viewpoint (sentiment) concurs with their concrete behavior and actions (engagement). For instance, a positive investor sentiment aligned with an important level of investor engagement (robust trading activity) may trigger an increase in the company's share value.

In examining the crucial role of individual investors, our research endeavors to apply the construct of the Customer Journey to formulate an Individual Investor Journey. Integrating this redefined concept, we aim to delve into the process of selection, acquisition, and evaluation of a stock by an individual investor within a journey framework. Empirical evidence suggests that investors who have previously garnered profits from stock transactions are inclined to reinvest (Glaser & Weber, 2009; Magron & Merli, 2015), whereas those incurring losses often postpone selling, thereby proportionally exacerbating their losses (Atilgan et al., 2020). Therefore, the exploration of the Individual Investor Journey emerges as a particularly salient component of our study.

3.4.1. Individual Investor Journey

In studying the concept of the Individual Investor Journey, we will begin by scrutinizing the concept of the customer journey. This analogy is very much grounded in reality; particularly when we examine the individual investor, we conclude that from the perspective of choosing a security among the existing offerings, the investor manifests a behavior more akin to a consumer than an investor (Barber & Odean, 2008; Morvan & Le Gall-Ely, 2021)

The terms 'Customer Journey' and 'Customer Experience' are frequently deployed in marketing literature. However, for the purposes of this study, we will adopt the following definition: The customer journey is underscored as a composite of diverse customer experiences evolving over time. In this dynamic process, the Customer Journey crucially integrates past customer experiences and integrates externally available information at various touchpoints between the company and its customers and strategically prepares for future customer experiences (Lemon & Verhoef, 2016).

The customer experience is typically divided into sections. This division is done considering various characteristics related to the process the consumer goes through. The most common terms used to identify the phases of the customer experience include pre-purchase, purchase, and post-purchase (Lemon and Verhoef, 2016) but they can also be labeled as pre-phase, main service phase, and post-service phase. Thus, we generally have two major categories of terms: steps or stages (Følstad & Kvale, 2018). However, not all authors consider the customer experience with three steps/phases. For instance, Dellaert (2019) presents a model that defines the consumer decision making steps into four stages - exploration, purchase, consumption, and reflection - mirroring the broader marketing literature. Initially, consumers investigate the market to satisfy their needs, predicting the utility various products will provide. The next stage in the traditional consumer journey involves purchasing goods and services.

Following this, consumers go to the consumption stage, generating experienced consumption utility. The last stage involves reflection, where consumers evaluate the quality of their experiences and use this to make future decisions. Conceptually distinguishing these steps, despite their interconnectedness, can help marketers examine consumer activities, evaluation processes, levels of expertise, and engagement for each step.

The Customer Experience is the dynamic purchase relationship that flows through touchpoints following the three phases of the purchase process: pre-purchase (which includes the research phase), purchase, and post-purchase (Lemon and Verhoef, 2016). Verhoef et al. (2009) define "customer experience as a holistic experience involving customers' cognitive, affective, emotional, social, and physical responses to the company". According to the authors, this experience is created not only by elements that the company can control (e.g., service interface, retail atmosphere, product/service variety, price) but also by elements that are out of the company's control (e.g., other people's influence, purchase purpose).

In our model of the Individual Investor Journey, we consider a three-phase framework: pre-purchase, purchase, and post-purchase. In the scenario of a security or stock acquisition, the notion of consumption as such does not make sense, therefore making this three-phase model more pertinent. During the pre-purchase phase, the individual investor undertakes a rigorous evaluation of available options, explicitly those pertaining to securities readily purchasable in the market. The purchase phase is characterized by the investor's decision-making process concerning the optimal timing and the

channel of transaction for the acquisition. Finally, the post-purchase stage encapsulates an unwavering evaluation by the investor regarding the appropriate timing to divest from the security in question.

Drawing on a parallel between loyalty loops and involvement spirals, the research by Siebert et al. (2020) provides substantial contributions to the Customer Experience Management (CXM) discipline. By further developing the concepts associated with the customer journey, two alternative models are introduced: the smooth journey model and the sticky journey model.

The smooth journey model aims to make customers' lives easier by providing a predictable pattern of experiences, leading to the development of customer loyalty over time. This pattern is often referred to as a loyalty loop. On the other hand, the sticky journey model strives to make customers' lives more exciting by offering a cyclical pattern of unpredictable experiences. This approach increases customer involvement over time and can be conceptualized as an spiral involvement (Siebert et al., 2020).. In the context of this study, our attempt is to capture this dimension, particularly, the type of journey investors experience—whether a smooth journey or a sticky journey. This relationship will be particularly consequential for positioning individual investors in relation to the specific stock they purchase. By understanding the type of journey investors embark on, we can better discern their behavior patterns and strategize aptly for improved CXM practices.

3.4.2. Investor Engagement

Investor engagement entails active participation and interaction between investors and the companies they have invested in (Kakhbod et al., 2022). This concept emphasizes the significance of fostering a mutually beneficial relationship that promotes transparency, accountability, and long-term value creation. Through engagement, investors have the opportunity to express their perspectives, influence corporate decision-making, and acquire information critical for making informed investment choices.

For instance, a study exploring the impact of social media platform X (previously known as Twitter) on investor attention and engagement with two cryptocurrencies, Ethereum and Dogecoin, was conducted by (Bouteska et al., 2023). The introduction of the Search Volume Index (SVI) as a direct measure of investor attention based on search frequency in Google was proposed by (Da et al., 2011). Similarly, a comparative analysis of sustainability reports was carried out by (Ruiz et al., 2021), focusing on companies in shareholder-oriented markets (such as the United States of America) and stakeholder-oriented markets (such as Spain), and examining the influence of investor pressure.

Further shedding light on investor behavior, (Kyaw et al., 2022) examined the influence of investors' aversion to environmental risk on their responses to firms' earnings announcements. (Hadani et al., 2011) found that shareholder activism motivates firms to actively manage their image through earnings management. From the perspective of activist investors, engagement has been shown to have a highly positive impact on both Environmental, Social, and Governance (ESG) performance and financial performance, as demonstrated by (Barko et al., 2022). Introducing the concept of a "bridged approach" for developing and maintaining relationships with shareholders, (Makwambeni & Matsika, 2022) highlighted its significance.

Notably, during times of crisis, such as the COVID-19 pandemic, firms with better-quality investor relationships were found to demonstrate higher levels of investor loyalty and experience increased stock returns, as observed by (Neukirchen et al., 2023). These findings collectively contribute to a deeper understanding of the dynamics and implications of investor engagement in various contexts.

3.4.3. Investor Sentiment

Investor sentiment is a relevant notion as it captures the way investors over and under reactions to fundamental information (Merrin et al., 2013). Investor sentiment has been a deeply studied concept, rooted in behavioral economics theory. Behavior Economics uses variants of traditional economic assumptions (often with a psychological motivation) to explain and predict economic future reality, and to provide policy prescriptions. In contrast, the classic finance theory rests on the Efficient Market Hypothesis (EMH), postulating that investors consistently display economically rational behavior, as if embodying the Homo Economicus. In Fama (1970), the author creates a model in which he tests the theory of efficient financial markets and concludes that, although there are conditions for the confirmation of the theory, he defends that the EMH should be considered, and its study should be deepened. In the last decades, several works have focused on the subject, and the criticisms made by behavioral economists have appeared, claiming that the EMH does not explain the behavior of markets, in periods of financial crisis.

In the context of reacting to new information, investors often exhibit economically irrational behavior. Specifically, overreaction, characterized by individuals reacting excessively to unexpected and dramatic news, has been observed both in financial markets and among financial sector professionals (De Bondt

& Thaler, 1985). Another behavioral bias, overconfidence, is evident when investors realize gains on assets prematurely and delay recognizing losses (Odean, 1998). Loss aversion, a psychological condition wherein individuals overvalue the risk of losses and underestimate the risk of gains, has been extensively studied in the context of risk theory. This behavioral pattern is often observed among lottery players and insurance takers (Kahneman & Tversky, 2013). These criticisms have fueled a heated debate, in recent decades, about the validity of the EMH theory.

The idea that fluctuations in discounts of closed-end funds are influenced by shifts in individual investor sentiment was explored by Lee et al. (1991). Two prevalent patterns of stock price reactions to news have been extensively studied. The first pattern pertains to the underreaction of stock prices to individual news events, such as earnings announcements. Alternatively, the second pattern involves the overreaction of stock prices to a series of consecutively good or bad news. In this context, a model reflecting investor sentiment - illustrating how investors form beliefs - was proposed. This model aligns coherently with empirical observations and it is based on psychological evidence Barberis et al. (1998).

A theoretical connection between sentiment and momentum in stock trading is put forward, focusing on the way news spreads gradually amongst different observers, namely momentum traders and news watchers. As these observers become aware of and react to the news in their trades, they generate market momentum. This trading momentum may be fueled by the investors' value assessments, which might be impacted by how news affects economic fundamentals. This continuous cycle could influence the way investors perceive the value of assets, suggesting a potential link between sentiment and momentum in stock trading (Hong & Stein, 1999).

The significance of incorporating investor sentiment as a key influencer of stock returns is explored, revealing that sentiment particularly impacts stocks that are challenging to arbitrage and objectively

value. This revelation buttresses the concept that subjective valuations may be more prone to fluctuations in sentiment, underscoring the important role investor sentiment plays in the dynamics of stock returns (Baker & Wurgler, 2006; Karampatsas et al., 2023)

The focus has shifted from questioning the impact of investor sentiment on stock prices to measuring and quantifying its effects. Approaches include analyzing individual biases and differences in opinion among investors, as well as a top-down approach that examines aggregate sentiment and its influence on market returns and stocks. These models go beyond simple assumptions, recognizing the complexity of real markets and investors. By studying marketwide sentiment, they aim to determine which stocks are most impacted by sentiment, providing a deeper understanding of investor behavior and market dynamics (Baker & Wurgler, 2007). The *Adaptive Markets Hypothesis* analyses financial markets from a biological perspective incorporating a new approach to explain market behavior Lo (2007). Changes in investor sentiment during the initial half-hour were found to forecast the subsequent half-hour returns of the S&P 500 index ETF. The research further identified that these sentiment effects were predominantly driven by novice traders, underscoring the presence of sentiment-driven noise trading (Renault, 2017).

However, this study aims to analyze investor sentiment from the perspective that affects individual investors decisions and is an essential component of their investor journey. The study considers the simplicity and availability with which individual investors can now trade. For example, investors may use apps in their mobile phones and take advantage of open stock exchanges in various time zones. This accessibility, coupled with low or even zero commissions, creates an environment where investor sentiment plays an increasingly vital role in the process of selecting, purchasing, and selling stocks. As a result, investor sentiment will become an increasingly important variable in the investor journey.

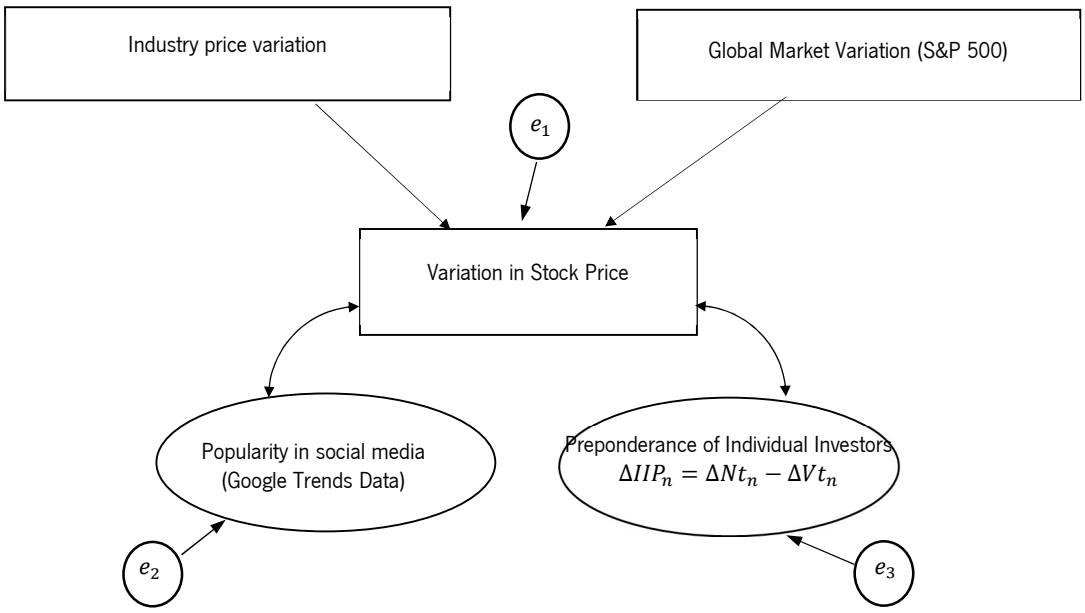
3.5. Conceptual Model: The Individual Investor Journey

We develop a model (Figure 10) that captures the journey of the individual investor, for which we will construct an estimation model that predicts the behavior of the individual investor and their reaction through sentiment captured on social media. Individual investors are attention-driven, meaning they tend to buy stocks that are featured in the news and media (Barber and Odean (2008).

The first step of a journey begins with the prepurchase assessment. In the prepurchase assessment model, there are both observable and latent variables. Observable variables are directly measurable or observable in a research study, while latent variables are abstract concepts inferred from observable variables (Stephenson & Holbert, 2003). Investor Sentiment a latent variable measured with data collected from Google Trends. Consequently, it is necessary to incorporate within the model an error term e_2 that accounts for the estimating errors of the investor sentiment.

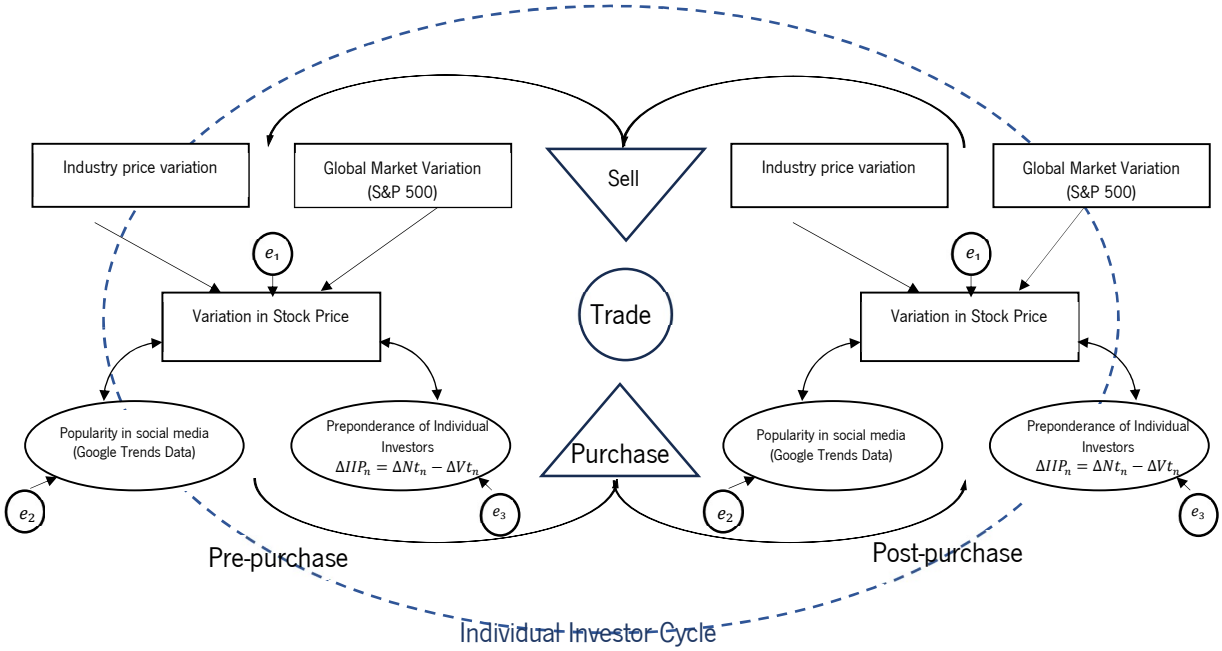
Another latent variable in the model is the prevalence of individual investors. This is calculated via the dispersion of orders and hence, the model needs to include an error term e_3 to factor in the estimating errors tied to this latent variable. Variations in company stock price and market are observable variables that can be obtained from the financial data available on multiple electronic platforms. Nonetheless, the model must also include an error term e_1 for the unaccounted variances not identified in this model. As such, each error term ($e_1, e_2, and\ e_3$) encapsulates the limitations of the model in accurately estimating the respective variables.

Figure 10 - The Investor pre purchase assessment



Utilizing the information and variables from our model specific to the individual investor's decision-making process, we can effectively illustrate the investor journey in a graphical format, as depicted in Figure 11. The investor's journey is a continuous cycle of evaluating stock prices. This evaluation is mediated by market conditions, investor sentiment, and circumstances specific to the individual investor. At any given moment, the shareholder is predicting the future price of their share and will decide to sell if they anticipate a price decrease. In contrast, the shareholder may choose to maintain or even increase their holdings if they expect the share price to rise. Nevertheless, investors tend to learn from their past experiences and emotions when making investment decisions. This suggests that the memory of positive emotions associated with past investment in specific stocks increases the likelihood of future investment in the same. Conversely, negative emotional experiences tied to the acquisition of certain stocks may discourage future purchases (Strahilevitz et al., 2011).

Figure 11 - The Individual Investor Journey Model



3.6. Research Hypotheses

There are intricate dynamics of market movements and individual trader psychology, both of which have implications across micro and macroeconomic levels. We use popularity in social media, and its variation over time, to simulate investor sentiment as proposed by (Da et al., 2011). This hypothesis on the other hand, tests how these market conditions are interpreted. It is a measure of the overall attitude towards a particular market or asset. The underlying rationale is that if the sentiment is positive, it means individual investors are likely to invest more, driving up demand and consequently, asset prices. Conversely, a negative sentiment indicates a bearish perspective, which may lead to a sell-off, causing prices to drop (Banerjee & Kundu, 2024). Hence, we hypothesize that:

H1: Market trading conditions (measured in terms of investor sentiment) exert a positive influence on the decision-making processes of individual investors.

In this study we evaluate the relationship between popularity on social media and investor sentiment, specifically examining whether social media popularity can serve as an accurate predictor of investor sentiment. By analyzing the data and employing statistical methods, this study seeks to determine the extent to which social media popularity can provide reliable insights into investor sentiment. As referred earlier, investor sentiment captures the prevailing attitude of investors towards the broader financial market or a particular stock (Zhang & Shen, 2024). It represents a collective economic intuition or consensus that can swerve between optimism and pessimism, thereby influencing investment decisions. Positive investor sentiment often leads to increased buying activity which in turn drives up the price of stocks, while negative sentiment leads to selling pressure, causing stock prices to fall. Hence, a thorough examination of investor sentiment can provide useful insights into future price movement trends. Furthermore, an overly positive or negative investor sentiment can sometimes indicate potential market bubbles or crashes, which might lead to mispricing in stocks. Therefore, it is crucial to approach this question with a comprehensive understanding of other fundamental and technical aspects as well, to ensure a more holistic prediction of future stock prices while factoring in investor sentiment (Audrino et al., 2020). Popularity on social media accurately predicts investor sentiment, hence we hypothesize that:

H2: Higher popularity on social media corresponds to a more positive investor sentiment.

Until now several research studies (Baker & Wurgler, 2007; Barber & Odean, 2013; Kaniel et al., 2008; Kumar & Lee, 2006) have been conducted with a focus on exploring the relationship between individual

investor participation and stock price fluctuations. The prevalent stance accedes indistinct and inconsistent correlations between these factors. The current study posits the imperative necessity to re-evaluate such assumptions within the current economic climate, as previously alluded to.

The conventional reasoning for the ambiguous link between individual investor involvement and stock price movements is based on two primary arguments: (i) numerous factors influence stock prices, including company-specific news, macroeconomic factors, geopolitical situations, and institutional trading, often overshadowing the effects attributed to individual investor actions; (ii) individual investors often have fewer resources compared to institutional investors. However, contemporary observations reflect collective uprising movements amongst individual investors which challenge the traditional paradigm. Despite having comparatively lesser buying power and a smaller share of market transactions, their collective trading activities may exert considerable effects on stock prices. Hence, we propose that:

H3 There is a significant relationship between the preponderance of individual investors and stock price valuations. An increase in the trading activity of individual investors corresponds to an increase in share prices.

Having analyzed the prior hypotheses, we will now investigate the reverse direction. Specifically, we aim to discern the extent to which fluctuation in stock prices will trigger a corresponding change in the preponderance of individual investors (Ding & Hou, 2015; Hong & Stein, 1999). Here, we also take note of the coefficient's sign to ascertain whether an increase in stock price will instigate a greater prevalence of individual investor activity. Hence, we propose that:

H4. An increase in stock price corresponds to an increase in individual investor trading activity.

The null hypotheses would be the opposite of these three four hypotheses. They suggest that there is no significant relationship between the variables being studied. The goal of our analysis would be to reject these null hypotheses, thus providing evidence in support our research hypotheses.

3.7. The Individual Investor Journey Model Specification

The Individual Investor Journey model captures relationships among relative variations in daily traded volume, daily number of transactions, social sentiment of the day, and daily price variation of the security. The difference between the relative variations in traded volume and number of transactions will provide insights into the behavior of the individual investor. In our study, we propose that this difference captures the behavior of the individual investor because volume includes movements from institutional investors and individual investors. However, the difference between the variations in volume and number of transactions captures the interference of individual investors. Additionally, when we observe a variation in the number of transactions that is greater than the variation in traded volume, we estimate that individual investors have had a positive statistically significant intervention at that moment.

We understand that there is a debate about this idea and the splitting of orders by institutional investors. However, we assume that institutional investors trade regularly and professionally and their strategy is continuous over time. Individual investors are usually looking for opportunities and when they find one, they tend to trade in small amounts. This distinction between Individual Investor Behavior and

Institutional Investors procedures is what we aim to capture. To identify the behavior of individual investors, we will create a quantitative variable that captures the variation in the activity of individual investors, which we can refer to as: Individual Investor Preponderance (IIP).

$$(1)\ \Delta IIP_n = \frac{Nt_n - Nt_{n-1}}{Nt_{n-1}} - \frac{Vt_n - Vt_{n-1}}{Vt_{n-1}}$$

$$(1)\ \Delta IIP_n = \Delta Nt_n - \Delta Vt_n$$

$\Delta IIP_n - Individual\ Investor\ Preponderance\ variation\ in\ n$

$\Delta Vt_n - Volume\ traded\ variation\ in\ n$

$\Delta Nt_n - Number\ of\ trades\ in\ n$

In this way, we can define trade variation as the sum of all trades from individual investors and institutional investors. If ΔIIP_n represents the variation in the activity of individual investors, and ΔT_n represents the variation in the activity of all investors (ΔIIt_n plus ΔIMt_n), we can express it as:

$$(2)\ \Delta T_n = \Delta IIP_n + \Delta IMP_n$$

$\Delta IMt_n - Institutional\ and\ Major\ Investors\ preponderance\ variation\ in\ n$

$\Delta T_n - Trade\ variation\ in\ n$

If we define that the variation in demand is identified by the variation in number of executed trades multiplied by the average volume of each transaction, for each day, we can arrive at this calculation. Having reached this point, we have the component to study the demand of individual investors.

To simulate and study the price behavior of a company's stocks, it is necessary to isolate market and sector-specific factors. Accordingly, it is crucial to select a set of companies that is representative of the sector while individually being recognizable to capture the relationships between individual investors and these companies. In this regard, to undertake the empirical component of this study, we

will focus on the North American commercial aviation industry. We selected five companies that represents more than 89,54% of sector capital market American Airlines, Delta Airlines, United Airlines, Southwest Airlines and Alaska Airlines.

To simulate industry price variation, we use the average price variation of each company. And to simulate the global market we use the S&P 500 index as significant. The purpose of these choices is to attempt to capture correlations between the price of each selected company's stock and sector fluctuations, thus isolating the sector's economic factor in the analysis. Additionally, it aims to identify correlations between price variations of each company and the global market.

Regarding the investor sentiment on social media, we look for statistical evidence on the relationship between the sentiment of individual investors on Google Trend Search platform, following the work of Da et al. (2011), (Audrino et al., 2020) and Berger (2022). They measured individual investor sentiment by analyzing aggregate search frequency data from Google. By examining the correlation between investor attention levels and asset prices, we aim to gain insights into market behavior dynamics and their impact on financial outcomes.

We have chosen to utilize aggregate search frequency data from Google for two reasons. Firstly, it is widely recognized that individuals rely on search engines as their primary source of information in the digital age. Additionally, Google remains the most popular and extensively used search engine globally (Da et al., 2011), providing us with a comprehensive dataset for analysis. By leveraging this data, we can empirically quantify the extent of attention that investors focus on specific assets or markets, allowing for a better understanding of how investor sentiment influences price movements. This approach offers a more direct and real-time measure of attention since it reflects the collective interests and information-seeking behaviors of numerous market participants. By examining the relationship

between investor attention, as measured by aggregate search frequency on Google, and asset prices, we aim to contribute to the existing body of knowledge on the role of investor behavior in financial markets. This research has the potential to enhance our understanding of market dynamics and provide valuable insights for investors, policymakers, and market analysts alike. To collect the data, we selected the "Finance" option in the Google Trends search category, in order to delimit the research context. Regarding the search type, we chose "web search".

$$(4)\ \Delta PSM_{kt} = \frac{PSM_{kt} - PSM_{kt-1}}{PSM_{kt-1}}$$

$PSM_{kt} - Popularity\ in\ social\ media\ company\ k\ in\ t\ moment$

The utilization of social media popularity to analyze investor sentiment is a topic that generates considerable debate, and we are aware of this fact. The increase in popularity can stem from both positive and negative reasons. However, our primary concern lies in determining whether this increase in popularity will lead to a rise in individual investors' stock market transactions. Thus, through a comprehensive analysis of the five variables in the model, we aim to evaluate whether social media popularity serves as a causal factor for the two specific variables related to the company, namely Individual Investor Preponderance and Stock Price Variation. It is worth noting that this study does not consider variations in the industry and market as a whole.

Following the definition of the components of model, preponderance of individual investor, investor sentiment, industry stock price variation, market stock price variation and stock price variation, as presented in Figure 11 - The Individual Investor Journey, we propose a multiple linear regression model to study and test the significance of the correlation and causality of all this variables.

3.8. Model Assessment and Estimation

We use real data to test our model. To make the model as robust as possible, we need to test it in a real capital market. For this purpose, we consider that the North American market, particularly the NYSE and NASDAQ, would be the financial markets that best capture the interest of individual investors due to their size, transaction volume and world visibility. After selecting the market, we decided to isolate a specific sector to eliminate any exogenous disturbances affecting companies within that sector for market-related reasons. The chosen sector is the commercial aviation sector, which has a relatively concentrated number of companies but is still large enough to conduct a comparative study. The selected companies are United Airlines (UAL 18,57%), American Airlines (AAL 11,06%), Delta Airlines (DAL 31,78%), Southwest Airlines (LUV 21,84%), and Alaska Airlines (ALK 6,29%), which together represent close to 89,54% of the market capitalization of American passenger transportation companies. Besides there are other studies as Patel et al. (2023) about this sector that study the sentiment analysis of customer feedback that we can use to compare our results and findings.

We gathered data for this analysis from multiple sources including www.sec.gov[5], Google Trends, and Investing.com. The data for this study spans a specific time frame from January 1, 2012, to September 30, 2023, encompassing a total of 141 months. For the trading volume and number of transactions, we pulled 141 .csv files from www.sec.gov that contained over 290 million lines of data. To manage and assess this large volume of data, we used Power BI, which is a data visualization tool. We filtered and selected relevant information pertaining to our selected five companies using this tool. After we combined and summarized the data from various US markets, we had observations from 2.953[6]

[5] https://www.sec.gov/opa/data/market-structure/market-structure-data-security-and-exchange

[6] Due to the merger between American Airlines and US Airways, data for American Airlines is only available from December 9th, 2013, onwards. Therefore, we only have 2.467 observations for this company.

trading days which totaled 14.279 sets of data. Next, we used Google Trends[7] to collect data on social media popularity. We used the specific search terms “American Airlines,” “Delta Airlines,” “United Airlines,” “Southwest Airlines,” and “Alaska Airlines''. Our intention was to gauge the social sentiment towards these companies and extrapolate that as the potential sentiment of investors since we choose the “Finance” category to get the most relevant data to investors. This method has been utilized in previous research ((Da et al., 2011);(Audrino et al., 2020) and (Kim et al., 2023)). Finally, we referred to Investing.com to collect end-of-session stock price data for each of our selected five companies. All these datasets together allowed us to have a comprehensive picture and a high granularity of detail for our analysis.

[7] https://trends.google.com/trends/

3.9. Data Analysis Procedures

The statistical validation of the model was conducted as a preliminary exploratory data analysis. For this purpose, we utilized the graphical functions available in Excel and performed the statistical analysis, specifically focusing on Descriptive Statistics, Correlation, and Covariance. The obtained results were considered interesting, leading us to proceed with a more robust analysis to test the validity of the correlations within a 95% confidence interval. To assess the statistical significance of the correlations, we employed the R Commander package, which is a platform-independent graphical user interface (GUI) for basic statistics developed by Fox (2005).

Given the preliminary statistical findings, it was worthwhile to conduct a more comprehensive study. Thus, we proceeded with the construction of a Vector Autoregressive (VAR) model. The VAR model was initially introduced by Sims (1980). Sims proposed the utilization of VAR models as an alternative to the prevailing simultaneous equation models commonly employed in macro econometric analysis during that period. Sims argued that VAR models are more suitable for capturing the intricate dynamic structure observed in time series data. Unlike traditional models that pre-determine causal relationships between the observed variables, VAR models treat all observed variables as endogenous and employ statistical tools to reveal inter-relationships. This approach offers a more data-driven perspective with reduced reliance on potentially controversial theoretical assumptions (Lütkepohl, 2005).

A vector autoregression (VAR) with k time series variables consists of k equations, one for each of the variables, where the regressors in all equations are lagged values of all the variables. When the number of lags in each of the equations is the same and is equal to p, the system of equations is called a

VAR(p). The coefficients of the VAR are estimated by estimating each of the equations by ordinary least squares (OLS) (Stock & Watson, 2020).

Figure 12 - VAR model notation

$$Y_{1t} = \beta_{110} + \beta_{111}Y_{1t-1} + \cdots + \beta_{11p}Y_{1t-p} + \cdots + \beta_{k10} + \beta_{k11}Y_{kt-1} + \cdots + \beta_{k1p}Y_{kt-p} + \mu_{1t}$$

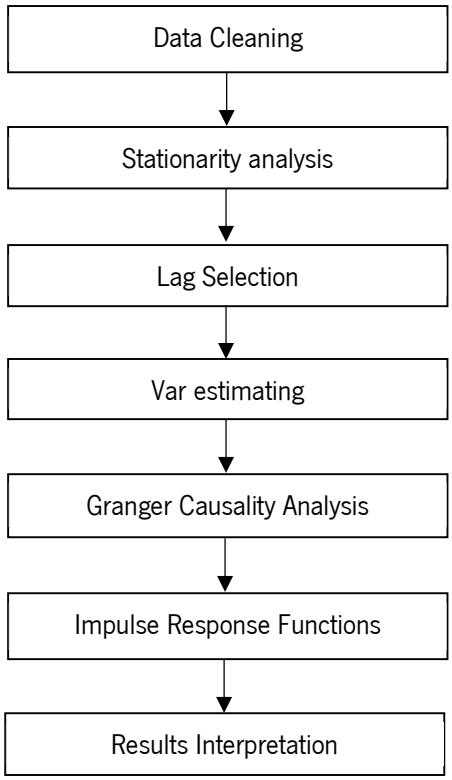
$$Y_{2t} = \beta_{210} + \beta_{211}Y_{2t-1} + \cdots + \beta_{21p}Y_{2t-p} + \cdots + \beta_{k20} + \beta_{k21}Y_{kt-1} + \cdots + \beta_{k2p}Y_{kt-p} + \mu_{2t}$$

...

$$Y_{kt} = \beta_{k10} + \beta_{k11}Y_{k1t-1} + \cdots + \beta_{k1p}Y_{kt-p} + \cdots + \beta_{kk0} + \beta_{kk1}Y_{kt-1} + \cdots + \beta_{kkp}Y_{kt-p} + \mu_{kt}$$

The summarized process for implementing VAR model as presented in Figure 12, entails: Data Cleaning, Stationarity analysis, Lag selection, VAR estimation, Causality/Lead-lag relationships, Impulse response functions testing and Results Interpretation.

Figure 13 - VAR Analysis Process



Data cleaning is a crucial step in preparing for Vector Autoregression (VAR) model analysis, involving handling missing values through methods such as interpolation or omission, detecting and treating outliers. It also includes normalizing or standardizing data to equalize scales and verifying data integrity to prevent errors. This process is vital to ensure the accuracy and reliability of the VAR model's outcomes, preventing spurious correlations and reinforcing the authenticity of detected relationships in the data (Stock & Watson, 2001).

One of the key assumptions in time series analysis is *stationarity*, which means that the properties of the process generating the series do not change over time (Said & Dickey, 1984). Often, economic, and financial time series are not stationary, i.e., their statistical properties change over time, and this is something that needs to be addressed during modeling. The term 'Unit Root' refers to a feature of some stochastic processes (such as random walks) that can cause problems in statistical inference involving time series models. A unit root test checks whether a time series variable is non-stationary and possesses a unit root. The null hypothesis is generally defined as the presence of a unit root and the alternative hypothesis is stationarity. To analyze the stationarity of our variables we use de Augmented Dickey–Fuller Test (Said & Dickey, 1984).

The lag length is a crucial element while estimating a VAR model. Too small a lag length may result in omitted variable bias whereas an overly large lag length may leave the model over-parameterized, reducing the degrees of freedom and increasing the estimated standard errors. When undertaking *Lag Selection* in our VAR model, we estimate with AIC information criterion as Stock and Watson (2020) proposes to large samples.

Granger Causality Analysis patterns are often looked for in time series econometrics to see how different economic and financial variables interact with each other over time. Granger (1969) causality

test, builds upon the VAR model to ascertain if past values of one variable help in forecasting the present values of another. If the coefficients of lagged values in the VAR model are jointly significant, then we infer that there is a Granger causality. We perform[8] the bidirectional *Granger Causality Analysis* for each pair of variables.

Impulse Response Functions (IRFs) trace the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables. The impulse response is numerically computed and then plotted for an intuitive understanding of how the model reacts to changes in the independent variables. The length of periods over which IRF is plotted is usually chosen arbitrarily. However, in most cases, it is advised to extend up to the point where the effect dies out (Stock & Watson, 2020). In our study, we extend the analysis until the effect diminishes, capturing the shock effect until its residual impact is achieved. This approach allows us to attain a comprehensive understanding of the full extent of the shock effect

[8] We use the granger causality analysis R tool to conduct our study.

3.10. Findings

3.10.1. The Individual Investor Preponderance Evolution

To analyze the behavior of the variable we propose, Individual Investor Preponderance (IIP), we examine its components and variations over time. The time period under analysis is long, spanning 141 months, which corresponds to 2.953 observations. Considering that the model variables are built based on temporal variations, we have 2.952 records for four companies and 2.461 records for American Airlines (AAL), considering that due to the merger with US Airways, we only have records from December 9, 2013.

The number of daily trades has generally increased, as indicated by the trend line in Figure 143 - Number of Trades (five companies) 2012 to 2023 (Sept) (month period). Between March 2020 and July 2021, coinciding with the COVID-19 pandemic, the capital market experienced abnormal volatility, with some months seeing a fivefold increase in the number of trades and transaction volume compared to the expected data. This exceptional period introduces volatility that hinders our analysis.

A daily market analysis is inherently associated with higher volatility due to the nature of market functioning. While the market operates for typically eight hours per day, news affecting the market is continuous. Therefore, we observe volatility resulting from the accumulation of information over a sixteen-hour period, which is then reflected in the market's next opening. Additionally, companies often choose to announce news or updates during the over the counter (OTC) period, further contributing to the volume of information that is not instantly absorbed by the market. This creates a temporal barrier that amplifies daily volatility in the capital market (Huber et al., 2024).

Throughout the 141-month analysis period, we observed some noteworthy periods. From 2012 to 2019, we experienced a period of price stability and low interest rates. However, between 2020 and 2021, as previously discussed, we faced a critical situation where market rules were continuously tested. Following the COVID-19 pandemic, we entered a phase characterized by high inflation and subsequent rises in interest rates worldwide. This situation was further exacerbated by the conflict between Ukraine and Russia, along with the resulting crisis of confidence and disruptions in global supply of goods and services.

The figures 13 and 14 depicting the number of trades and volume of trades clearly illustrate the behavior of the capital market for the selected companies, showing a growth trend in both metrics throughout the analyzed period. The impact of the COVID-19 pandemic on the capital market is clearly visible in the figures 5 and 6, highlighting the increased volatility it caused between March of 2020 until July of 2021.

Figure 143 - Number of Trades (five companies) 2012 to 2023 (Sept) (month period)

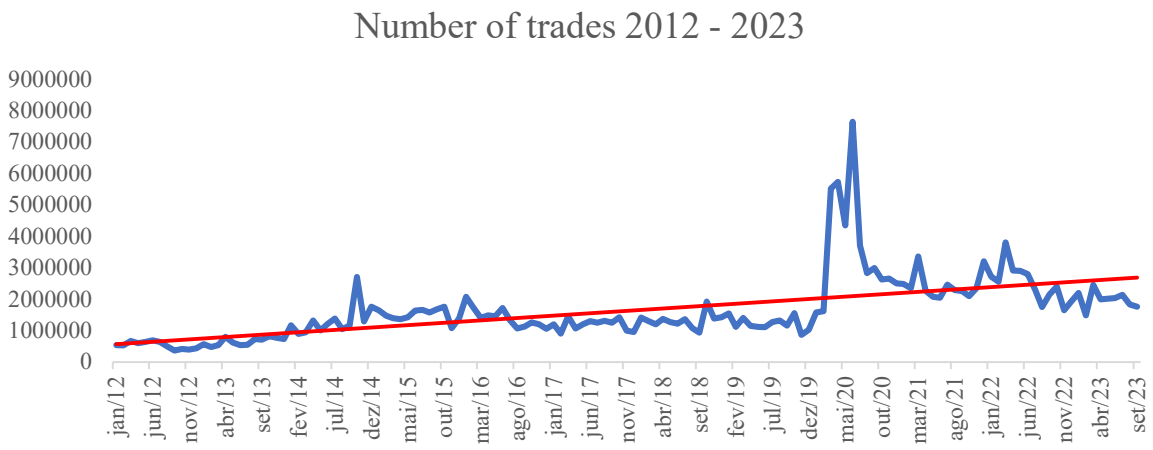
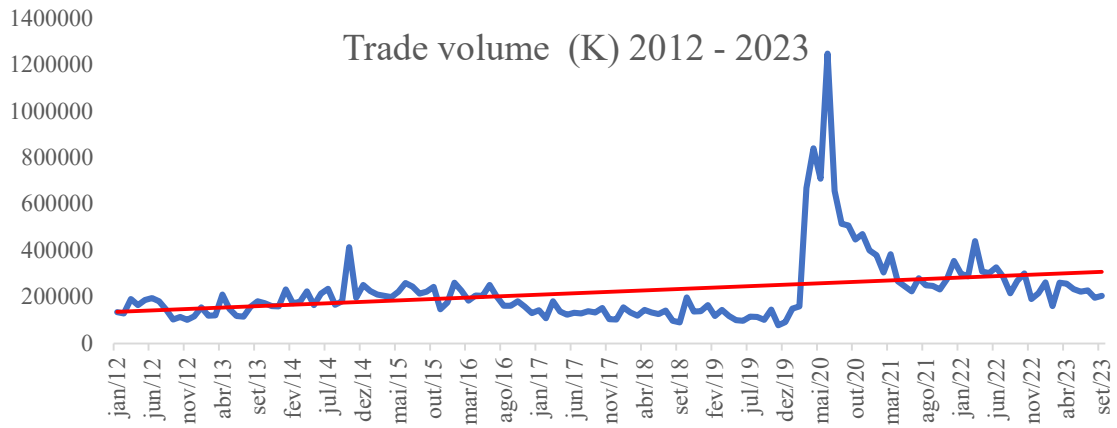
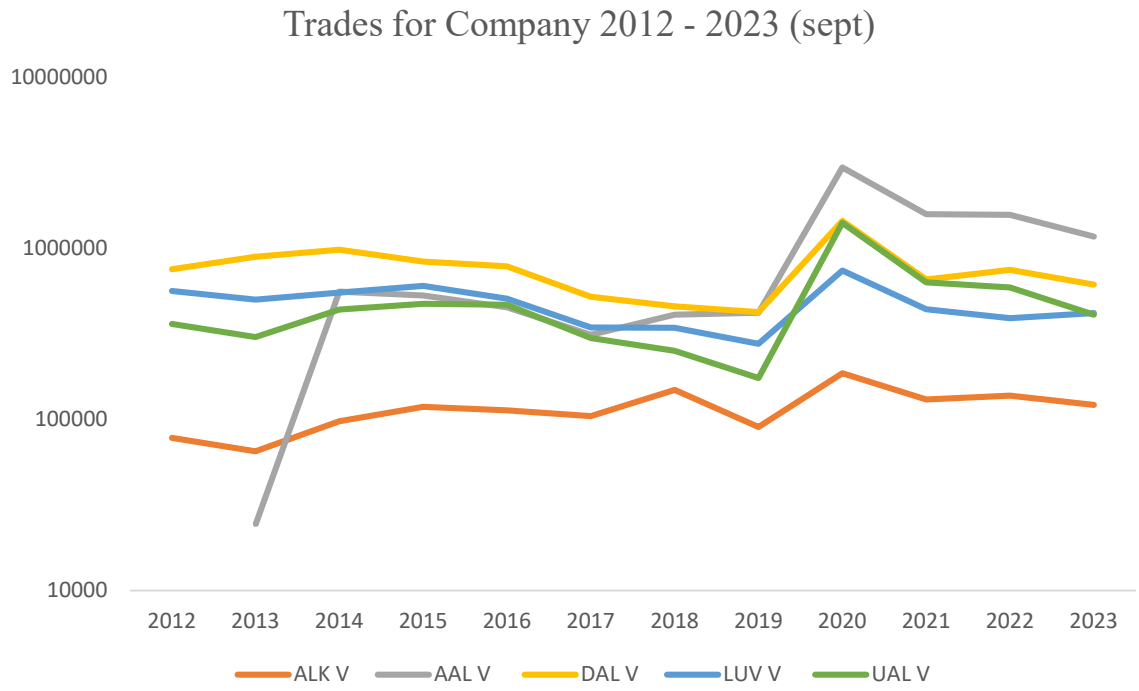


Figure 15 - Trade volume in thousands (five companies) from 2012 to 2023 (month period)



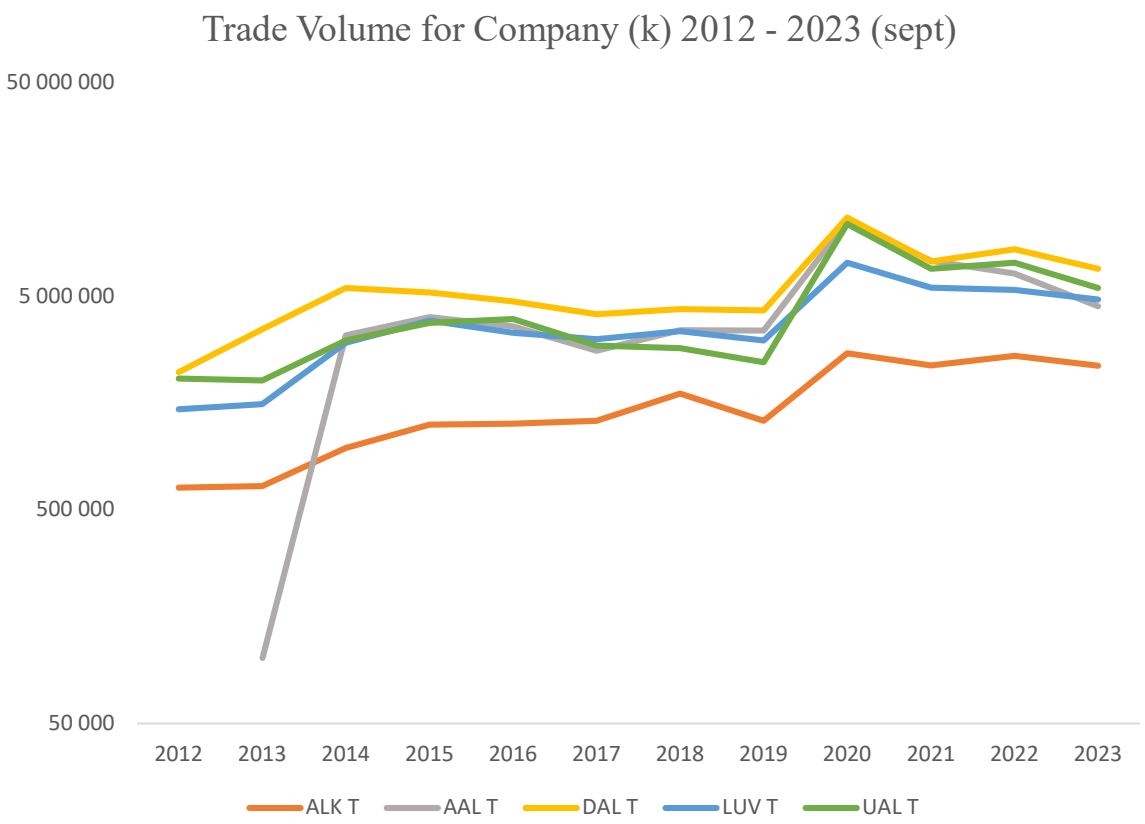
Upon examining the annual variations among the five companies, we observed that there was a growth in the number of transactions and the transaction volume during the studied period. This observation aligns with the initial hypothesis of this study, which postulated that we anticipated a surge in transactions with the influx of new individual investors in the market. This trend can be attributed to the democratization of trading access and the reduction of transaction fees. In a more precise examination, we noticed that the number of transactions was growing relatively stable until 2016 (Figure 165 - Number of trades for company) we observe a stabilization between 2017 and 2019. However, in the aftermath of the pandemic in 2020, we witnessed an exponential growth, which declined in the following year but stabilized at a higher level as compared to the years prior to the pandemic. Among all, AAL reported the highest number of transactions, although it ranks third in terms of transaction volume.

Figure 165 - Number of trades for company



As for the fluctuations in the transaction volumes until the pandemic period, we noticed a fairly steady phase followed by an exponential growth during the pandemic. This surge corrected in the subsequent year yet continues to grow steadily. The company with the greatest transaction volume is Delta Air Lines (DAL), as we can see in the Figure 17 - Trade volume (thousands) for company, followed by United Airlines (UAL). American Airlines (AAL) and Southwest Airlines (LUV) are competing for the third position, while the company with the smallest transaction volume is Alaska Air Group (ALK).

Figure 17 - Trade volume (thousands) for company



To evaluate the variable IIP, we began with constructing a table (Table 7 - IIP Individual Investor Preponderance) where we calculated the average and sum of daily variations during the analysis period. Subsequently, we divided the period into two sections: one up to 2019 and the second from 2021 to 2023, excluding the year 2020 from the analysis, which exhibits an outlier behavior. The analysis of Table 7 - IIP Individual Investor Preponderance reveals insightful data for our study. Firstly, at the global level, that is, across all five companies, the average of the period is zero, but the averages of the two sub-periods (2012 - 2019 and 2021 - 2023) are positive. This situation confirms the extraordinary circumstances in the year 2020, which, by itself, succeeds in altering the average of the period spanning 141 months. In terms of company-specific data, we find that AAL displays a negative IIP, and

in fact, has the highest magnitude value and is the only one that presents negative values across all periods. ALK and UAL exhibit averages with negative values, attributable to the year 2020, while DAL and LUV have positive averages throughout the entire period.

Table 7 - IIP Individual Investor Preponderance

	Global		AAL*		ALK		DAL		LUV		UAL	
			β 1,58[9] II[10] 47,19%		β 1,62 II 17,20%		β 1,43 II 29,55%		β 1,16 II 18,02%		β 1,54 II 29,71%	
	Sum	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum	Avg
2012 – 2023	-0,32	0,00	-3,89	-0,03	-1,05	-0,01	0,33	0,00	1,13	0,01	-1,21	-0,01
2012 – 2019	0,61	0,01	-0,01	-0,92	-0,47	0,00	0,96	0,01	1,44	0,02	0,05	0,00
2021 – 2023	0,28	0,01	-0,37	-12,23	-0,04	0,00	0,06	0,00	0,02	-0,01	0,34	0,01

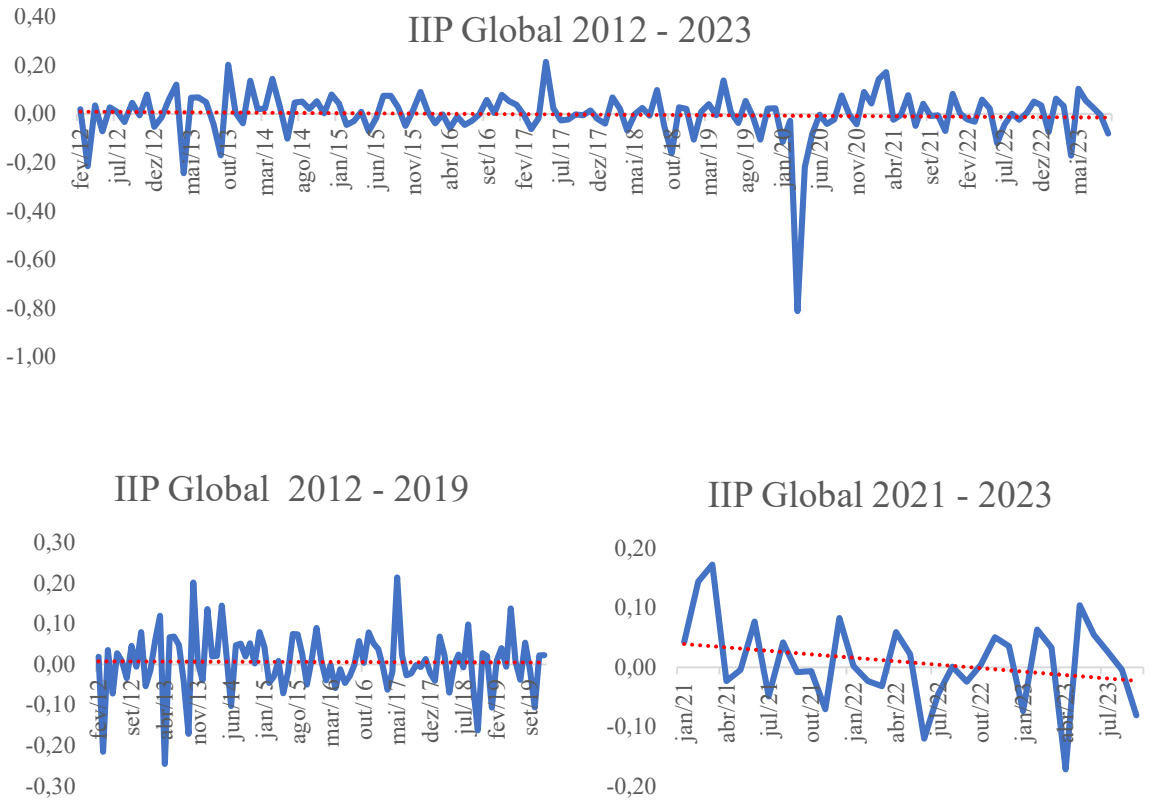
AAL* Since December 2013

When we analyze the IIP data graphically (Figure 17 - IIP Global Graphical Analysis), we can observe a significant decline during the pandemic, followed by a relatively stable average value. However, there has been a downward trend in the last two years. This decline can be attributed to various economic factors, such as rising interest rates and a period of unusually high inflation. Additionally, non-economic factors, including global socio and geopolitical climate, may also contribute to this trend.

[9] Data from finance.yhaoo.com for the five companies.

[10] The percentage of the company's equity held by individual investors is determined using data collected from the Interactive Brokers Group (IBKR) platform.

Figure 17 - IIP Global Graphical Analysis



The impact of economic factors, such as interest rates and inflation, on individual investor activity is well-documented Barber and Odean (2013) presents the effect of losses on behavior of individual investors. Higher interest rates can discourage investment and lead to a decrease in individual investor participation. Similarly, periods of abnormal inflation can create an uncertain economic environment, affecting investor confidence and activity. Moreover, non-economic factors, such as socio and geopolitical developments, can also influence individual investor behavior. Global events, political tensions, and social unrest can create an atmosphere of uncertainty, leading investors to adopt a more cautious approach and potentially reducing their level of investment activity.

When analyzing the Figure 17 in conjunction with Figure 13, it is evident that individual investors exited the market at the beginning of the pandemic and subsequently returned after November 2020. However, during the period when individual investors were absent, there was a significant surge in transactions and volume. This can be explained by the entry of institutional operators, supported by government aids, which effectively maintained the functionality of the capital markets during that challenging period. Notably, the aviation sector was one of the most heavily affected industries during the Covid-19 pandemic, and it would not have been able to sustain itself without the support provided.

3.10.2. Individual Investor Preponderance - test validation

In order to assess our variable Individual Investor preponderance (IPP), we will compare our data with the data provided by the Robintrack database. The use of Robintrack data to measure individual investor preponderance is not new, as Eaton et al. (2022) have successfully tested this approach. Robinhood publicly displayed the aggregate number of users (investors) holding each stock on their electronic trading platform, updated at approximately one-hour intervals. We obtained data for Robinhood brokerage investors from Robintrack, an independent website that utilizes the Robinhood API to identify and record Robinhood investor interest for stocks. Robintrack started collecting data in May of 2018, and the data spanned until February of 2020. The Robintrack data consists of hourly stock-level investor position snapshots. In order to validate our analysis, we calculated the daily average number of investors holding shares in each of the five selected companies and compared it with the data derived from our variable IIP.

Table 8 shows the correlation between the data obtained from the Robintrack database (AAL R, ALK R, DAL R, LUV R e UAL R) and the data calculated from our variable IIP (AAL, ALK, DAL, LUV e UAL). The methodology utilized to validate our variable IIP (individual investor preponderance) was as follows: we compared the daily variations in the number of individual investors for each of the five selected companies over the available time period, and then compared these variations with the results of our IIP variable for each of the five companies. The correlation matrix[11] between the two vectors of variables provides us with relevant information that supports the previous assumptions of our study and previous research. Specifically, there is a negative correlation for all companies, with the strongest correlation

[11] To calculate the Pearson correlation matrix, we utilized the R Commander package, which is a platform-independent basic statistics GUI (graphical user interface) maintained by Fox (2005)

being observed in the case of AAL and the weakest correlations for ALK and LUV. This negative correlation indicates that a decrease in the number of individual investors holding shares in a company is negatively correlated with an increase in the preponderance of individual investors in the market.

Table 8 - correlation matrix between IIP and Robintrack data with p values

	Correlation					p values				
	IIP AAL	IIP ALK	IIP DAL	IIP LUV	IIP UAL	IIP AAL	IIP ALK	IIP DAL	IIP LUV	IIP UAL
RT AAL	**-0,1017**	0,0403	-0,0017	0,0338	0,0358	**0,0337**	0,4016	0,9724	0,4809	0,4554
RT ALK	-0,0507	**-0,0287**	0,0114	0,0232	0,0294	0,2908	0,5501	0,8132	0,6286	0,5410
RT DAL	-0,068	-0,0494	**-0,0468**	0,0473	-0,0201	0,1561	0,3034	0,3291	0,3244	0,6755
RT LUV	0,0026	0,0111	0,0501	**-0,0266**	0,042	0,9561	0,8175	0,2970	0,5795	0,3822
RT UAL	-0,0281	-0,0318	0,0112	0,0075	**-0,0647**	0,5590	0,5072	0,8151	0,8753	0,1774

This relationship is important as it reinforces behavioral theories, such as the works of De Bondt and Thaler (1985) and Hong and Stein (1999), which argue that individual investors are more influenced by negative events and tend to overreact. On the contrary, when individual investors increase their participation, they have a lower preponderance in the market, while institutional investors have more preponderance at that moment. Regarding the strength of the correlation, we observed that the relationship with statistical significance (p-value < 0.05) is found in the case of AAL, with a value of -10.17%. Although this value may seem small, it is important to consider that we are comparing the data of all transactions that occurred in the market with the data of one online stockbroker.

In this context, we can characterize these results as highly significant. The fact that one company (AAL) stands out in terms of correlation can also be considered from the perspective of marketing finance and may have implications in evaluating its practices in this area.

To facilitate comprehension of the subsequent section, we have provided a Table 9 displaying the corresponding variables of our study and their respective contextual information.

Table 9 - Model Variables codification

IIP.AAL	Individual Investor Preponderance on American Airlines Shares
IS.AAL	Investor Sentiment Variation of the "American Airlines"
AAL price	American Airlines shares price
IIP.ALK	Individual Investor Preponderance on Alaska Airlines Shares
IS.ALK	Investor Sentiment Variation of the "Alaska Airlines"
ALK price	Alaska Airlines shares price
IIP.DAL	Individual Investor Preponderance on Delta Airlines Shares
IS.DAL	Investor Sentiment Variation of the "Delta Airlines"
DAL price	Delta Airlines shares price
IIP.LUV	Individual Investor Preponderance on Southwest Airlines Shares
IS.LUV	Investor Sentiment Variation of the "Southwest Airlines"
LUV price	Southwest Airlines shares price
IIP.UAL	Individual Investor Preponderance on Unites Airlines Shares
IS.UAL	Investor Sentiment Variation of the "United Airlines"
UAL price	United Airlines shares price

Table 10 - Regression Summary of Global VAR Model presents a summary of the statistically significant results from all regression equations that were produced by the five VAR models created, one for each company. The variables that were selected to be included in the summary are the variables: Individual Investors Preponderance (IIP), Investor Sentiment (IS), and the Stock Price of each of the five company's stocks (AAL – American Airlines, ALK Alaska Airlines, DAL Delta Airlines, LUV Southwest Airlines, and UAL United Airlines).

The VAR model produced five equations for each company, with the dependent variables being the three variables previously mentioned, as well as the market variables, Aviation Sector Price Variation and S&P 500 Variation. Considering that this study focuses on investigating the influence of the variables IIP, IS, and the stock price variation of each company, the summary presents the results of the equations for these three variables for each of the five companies. Therefore, we have a total of fifteen regression equations (columns in the table), where the first row represents the dependent variable, followed by rows identifying the independent variables.

The model selected five lags for DAL, LUV, and UAL, 6 lags for AAL, and 10 lags for ALK. Therefore, we have eighteen independent variables for AAL, 30 independent variables for ALK, and 15 independent variables for DAL, LUV, and UAL. Each lag represents the relationship of a variable at a specific moment in time with a certain time period t in the past of that same variable, where t represents the lag.

As expected, and considering that we are studying time series, the variables IIP and IS are significantly dependent on their past moments, with this dependence gradually diminishing in intensity. This property is observed through the coefficient value and its statistical significance, which is indicated by the number of asterisks ranging from strong (***) to weak (*) significance.

The five companies can be divided into two groups: Group X consists of AAL, DAL, and UAL, while Group Y consists of ALK and LUV. This division results from the analysis of the impact that IIP and IS have on stock prices. Although the impact is reduced, it is statistically significant. Further analysis reveals that, for Group X, the IIP variable is significantly affected by the IS and Price Variation variables. Therefore, we conclude that individual investors are sensitive to changes in social media popularity and stock price variation. Specifically, an increase in stock price leads to an increase in individual investors' positions. Regarding popularity, AAL has a positive impact in lags 2 and 5, but DAL and UAL have negative impacts, indicating that increased popularity repels individual investors.

In Group Y, we did not find statistically significant relationships, except for ALK, where lag ten has a weak but significant coefficient. However, this finding is of limited interest in our analysis due to its weak coefficient and significance.

When analyzing the Social Media Popularity IS as the dependent variable, we observe that it is strongly influenced by its previous lags for each of the five companies. However, Group X also shows significant impacts of IIP for AAL and UAL, as well as the price variation for AAL and DAL. In Group Y, only ALK shows an influence from lag six of the stock price. In conclusion, we can state that the Social Media Popularity of AAL and UAL is influenced by the Preponderance of Individual Investors and is also influenced by price variations in the case of AAL, ALK, and DAL.

Finally, when analyzing the stock price as the dependent variable, we find that Groups X and Y have significant impacts with their respective lags. Specifically, AAL shows significant impacts at lags 2 and 6, ALK at lag 1, DAL at lag 3, LUV at lags 1 and 4, and UAL at lags 1, 4, and 5. Regarding the variables IIP and IS as explanatory factors for stock prices, we find statistical significance in Group X, although

with reduced impacts as the coefficients are low. However, in the case of AAL, the significance is remarkably close to the permissible limit (0.050079, while the limit is < 0.05).

This study developed a new variable called Individual Investor Preponderance (IIP) and examined its impact, along with social media popularity, on a group of companies within the same industry. The research findings revealed that the impact of these variables on the companies was not equal. Therefore, it is crucial to understand the potential impact in other sectors and the causes of this asymmetry. Furthermore, it is necessary to investigate the commonalities among the companies where these variables do not have an impact and determine whether there are any shared factors that can explain this coincidence.

In conclusion, we can say that the stock prices of Group X companies are influenced not only by their past values but also by the Preponderance of Individual Investors and Social Media Popularity. This assertion is the cornerstone of this research but also opens a new research avenue as it is necessary to delve deeper into the study of the asymmetry of the impact of IIP (Individual Investor Preponderance) and IS (popularity on social media) on stock prices of the companies under investigation. Specifically, it is important to understand why these variables had no impact on the stock prices of Southwest Airlines. A new stream of research must be initiated to shed light on the asymmetries in individual investor attitudes.

Table 10 - Regression Summary of Global VAR Model

			Dependent variables														
			Individual Investor Preponderance					Investor Sentiment (Popularity on social media)					Stock Price variation				
			IIP AAL	IIP ALK	IIP DAL	IIP LUV	IIP UAL	IS.AAL	IS.ALK	IS.DAL	IS.LUV	IS.UAL	AAL Price Δ	ALK Price Δ	DAL Price Δ	LUV Price Δ	UAL Price Δ
Independent variables	IIP XXX	Lag 1	-0,371150 ***	-0,348600 ***	-0,284874 ***	-0,378292 ***	-0,309905 ***						0.008913 (a)				
		Lag 2	-0,148221 ***	-0,214400 ***	-0,127937 ***	-0,166444 ***	-0,153557 ***	0,071485 *									0,009106 *
		Lag 3	-0,119334 ***	-0,094600 ***	-0,072664 ***	-0,062076 **	-0,070689 ***								0,008547 *		
		Lag 4		-0,068520 ***	-0,048079 *	-0,049097 *	-0,052350 **					0,083693 **					
		Lag 5				-0,039444 *						0,095202 ***					
		lag 6															
		Lag 7															
		Lag 8															
		lag 9															
		Lag 10															
	IS.XXX	Lag 1						-0,275323 ***	-0,241523 ***	-0,248242 ***	-0,284715 ***	-0,167785 ***					
		Lag 2	0,025145 *					-0,147775 ***	-0,107034 ***	-0,120757 ***	-0,221969 ***	-0,107226 ***					-0,005118 *
		Lag 3					-0,024887 *	-0,111620 ***		-0,093578 ***	-0,174200 ***	-0,103990 ***					
		Lag 4			-0,026766 *						-0,044066 *						
		Lag 5	0,029200 *					0,462522 ***	0,099748 ***	0,451384 ***		0,361000 ***	0,005281 *		0,004861 *		0,005806 *
		lag 6						0,088057 ***									
		Lag 7							-0,037583 *								
		Lag 8															
		lag 9															
		Lag 10		-0,019220 **					0,090479 ***					0,004250 ***			
	XXX Price Δ	Lag 1					0,726918 **							-0,086780 *		-0,085452 *	0,189738 ** *
		Lag 2	0,941066 ***		0,592482 *								-0,133540 *				
		Lag 3								-0,913797 *					-0,107510 *		
		Lag 4														0,080163 *	-0,133915 **
		Lag 5															-0,131407 **
		lag 6						-0,901992 *	1,752530 *				0,194154 ***				
		Lag 7															
		Lag 8															
		lag 9															
		Lag 10															

(a) p- value 0.050079

3.11. Results of Granger Causality Analysis in R

As mentioned previously, Granger causality is a statistical hypothesis test that assesses whether one time series is useful in forecasting another. In this study, we utilized the Granger causality analysis to evaluate the relationship between the variables in our model (Table 11). This analysis allowed us to determine the causal links between the IIP, social media popularity, and the stock prices of the companies under investigation. By employing this methodology, we were able to gather insights into the interdependence and predictive power of these variables.

In the case of American Airlines (AAL), the data analysis reveals an interesting view. Specifically, there is strong statistical evidence indicating that the predominance of individual investors (IIP) has a causal impact on the fluctuations of share prices. This relationship is highly significant, with statistical significance observed at a 1% threshold. However, when considering the regression model, this relationship was not found to be statistically significant. In contrast, the findings suggest that share price fluctuations do not significantly reciprocate this relationship with individual investors. Additionally, the analysis reveals that variations in Investor Sentiment (IS) have a noticeable influence on share price fluctuations, albeit at a 5% significance level. It is important to note that this influence is not mutual, meaning that the impact of IS on share variations is not reciprocated in the same manner.

Turning our attention to Alaska Airlines (ALK), the causal relationships present themselves rather differently. In this case, only one significant relationship emerges - share price variations Granger-cause changes in IS, a phenomenon that is statistically significant at a 1% level.

A subtle complexity emerges when considering Delta Airlines (DAL). Both IIP and IS appeared to have significant bi-directional influences on share price variations, with each relationship meeting a 5% significance threshold. This suggests a dynamic interchange of influences among these variables.

Contrarily, for Southwest Airlines (LUV), our analysis found an absence of significant Granger causality among the studied variables.

When analyzing United Airlines (UAL), the narrative regains momentum. Once again, there is robust evidence at a 1% significance level that IIP Granger-causes share price variations. Meanwhile, IS appears to have a reciprocal influence with share price variations, both relationships holding true at a 5% significance level. Interestingly, the broader movements in the S&P 500 do not seem to instigate any significant effect on either IIP or IS within this landscape.

Lastly, and of significant importance, an analysis of correlations between statistically significant causality and the proportion of a company's equity held by individual investors (Table 12) reveals a direct relationship. This implies that as the percentage of equity held by individual investors increases, so does the influence of these investors and Investor Sentiment on variation in the company's stock price. This data holds considerable importance for individual investors when selecting stocks for their portfolios. When individual investors hold a larger share of a company's equity, the dynamics of the stock price fluctuations are more likely to be in alignment with their market behaviors and profiles in comparison to stocks that are primarily held by institutional investors. Such insight facilitates more informed decision-making process for individual investors. These narratives, crafted from the insights illuminated by the Granger causality test of these airlines, mark a critical steppingstone in understanding the multifaceted interplay between IIP, IS, and share price variations and corroborate the previous analysis of the VAR multi regression models.

Table 11 - Granger Causality Analysis

	AAL		ALK		DAL		LUV		UAL	
	F	*p- value*	*F*	*p- value*	*F*	*p- value*	*F*	*p- value*	*F*	*p- value*
IIP -> Stk Price Δ	7,7828	2,586e-08***	0,6782	0,7457	2,4586	0,03122*	2,1295	0,05915	4,7595	0,0002464***
Stk Price Δ -> IIP	1,0528	0,3889	0,7496	0,6779	2,585	0,0243*	0,748	0,5875	1,3958	0,2226
IS -> Stk Price Δ	2,7921	0,01041*	0,9775	0,4607	2,7628	0,01701*	0,493	0,7817	2,2433	0,04754*
Stk Price Δ -> IS	1,2675	0,269	2,5697	0,004287**	2,8981	0,01293*	0,5357	0,7494	2,6781	0,02017*
S&P 500 -> IIP	0,674	0,6707	0,8812	0,5502	1,2614	0,2778	0,4308	0,8274	1,467	0,1973
S&P 500 -> IS	0,6894	0,6583	0,6683	0,7549	1,3527	0,2392	0,4787	0,7924	1,5079	0,1839

3.12. Predictive Tests (Impulse Response Functions and Forecast Error Variance Decomposition)

After we analyse the models causality we test with Impulse Response Functions (IRFs) that were generated in R utilizing the VAR model for each companie. IRFs articulate the manner in which the system reacts over time to shocks in each variable.

A 'shock' in this context refers to the unexpected changes that occur. This analysis affords crucial insights into the relationship between the shocks to the variables and their subsequent realignment to equilibrium. IRFs, therefore, facilitate the understanding of the temporal dynamics of the variables under consideration. For instance, they might illustrate how an unexpected happening in the one variable of our data might influence future values of all the other variables and how this effect decays over time.

Secondly, the Forecast Error Variance Decompositions was also implemented in this study. The purpose of FEVD is to determine the proportion of the forecast error variance of each variable that can be attributed to shocks in every other variable. FEVD is useful in ascertaining the relative importance of each random innovation in affecting the variables in the VAR system. Hence, this can be particularly instructive, for example, in determining the degree to which variations in stock price can be explained by unexpected changes to IIP and vice versa. Both these analyses - Impulse Response Functions and Forecasting Error Variance Decompositions - provide critical understanding of the intricate dynamic relationships among these stock prices and serve as valuable tools in risk management and investment strategies.

In summarizing the graphical information to be presented in the following pages, it is pertinent to highlight the chosen impacts of the variables IIP (Individual Investors Preponderance) and IS (Investor

Sentiment) on each company's stock price variation. As regards the Forecast Error Variance Decompositions (FEVD), complete data for each variable will be displayed. In the two Impulse Response Functions (IRFs) plots, the x-axis represents the lags, while the y-axis conveys the impact of a shock in the IIP or IS variables on stock prices. The red dashed lines signify the 95% confidence interval. These plots are particularly informative in understanding how a shock impacts subsequent lags, as well as the predicted magnitude of such an impact.

As expected, the shock values of these two variables, IIP and IS, are generally low. Within the confidence interval, the majority of shock values encompass zero, suggesting that stock prices would remain unchanged in the event of a shock. However, there are exceptions to this pattern. Specifically, when examining the shocks of the IIP variable on the stock prices of AAL and UAL companies at lag 1, an impact is observed. In these cases, zero is not within the confidence interval, indicating a significant effect on stock price variations. Consequently, a confident inference can be made regarding the impact of these shocks on the stock prices of these companies.

Overall, while both variables generally show low shock values, there are specific instances where the shocks of the IIP variable have a notable impact on stock prices, providing valuable insights into the dynamics of these companies' stock price variations..

In regard to sector-wide price variations, they comprise a significant component of the fluctuations observed within the S&P 500 index. As for the individual company's price variations, these are strongly linked to their own price alterations, as well as the price variations of the sector and the S&P 500 index. Among these relationships, it's pertinent to note that the impact of sector-level changes outweighs that of other categories across all companies under study.

The analysis of Figure 19 provides crucial insights into the impacts of shocks on AAL's IIP and IS. An immediate, statistically significant impact is observed at lag 1 on the IIP, with confidence intervals excluding zero, demonstrating the measurable effect of the initial shock. However, this impact starts to diminish from lag 7, indicating the transient nature of the shock's influence. In contrast, shocks to the IS, as represented by AAL's derivative metric (AAL.GFV), show a longer and more sustained influence, despite the overall statistical insignificance suggested by confidence intervals that include zero at all lags. A noteworthy observation at lag 1 reveals the lower limit of the interval nearly excluding zero, suggesting a possible statistical significance at this initial stage and highlighting the profound initial effect shocks might have on investment sentiment.

Figure 18 - : AAL - Impulse Response Functions

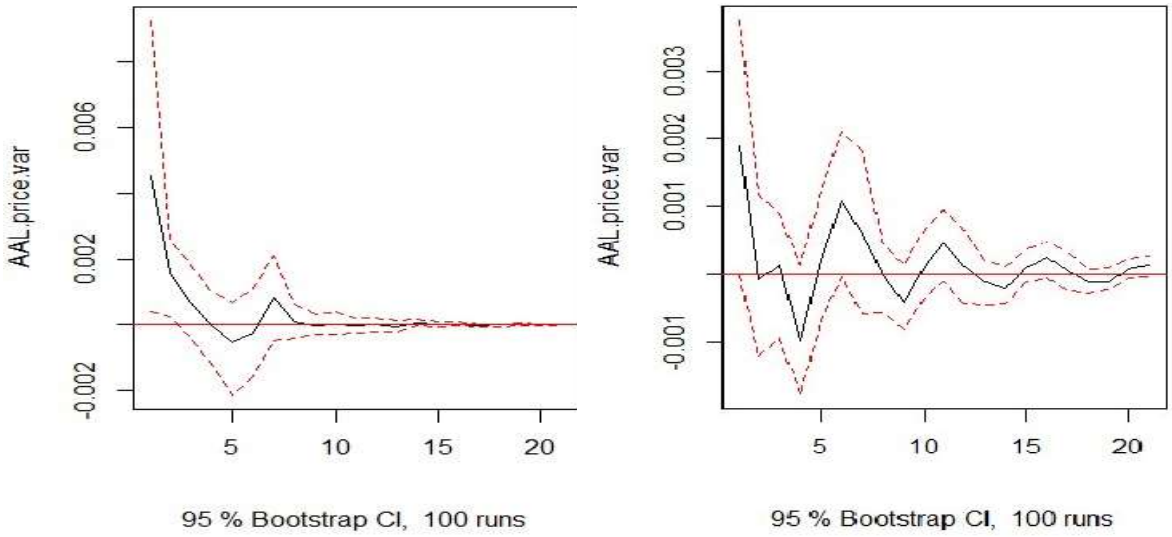


Figure 20 demonstrates the impulse response functions for Alaska Airlines (ALK) and Southwest Airlines (LUV). Upon detailed analysis, similarities are observed, particularly how shocks in IIP impact the outcomes. However, the confidence intervals consistently include zero for both companies, suggesting that the shocks might not have statistical significance. Consequently, a shock in IIP for any of these airlines might not significantly influence the stock prices. Conversely, shocks in the IS, as measured by the variables ALK.GFV and LUV.GFV, display a similar pattern starting from lag 2. They even present statistically significant impacts between lags 10 and 15, first showing a positive effect followed by a negative one. This analysis leads us to conclude that, for these two companies, while IIP has a limited impact, IS between lags 10 and 15 initially affects the stock prices positively, followed by a correction in the stock prices of the companies.

Figure 19- ALK and LUV - Impulse Response Functions

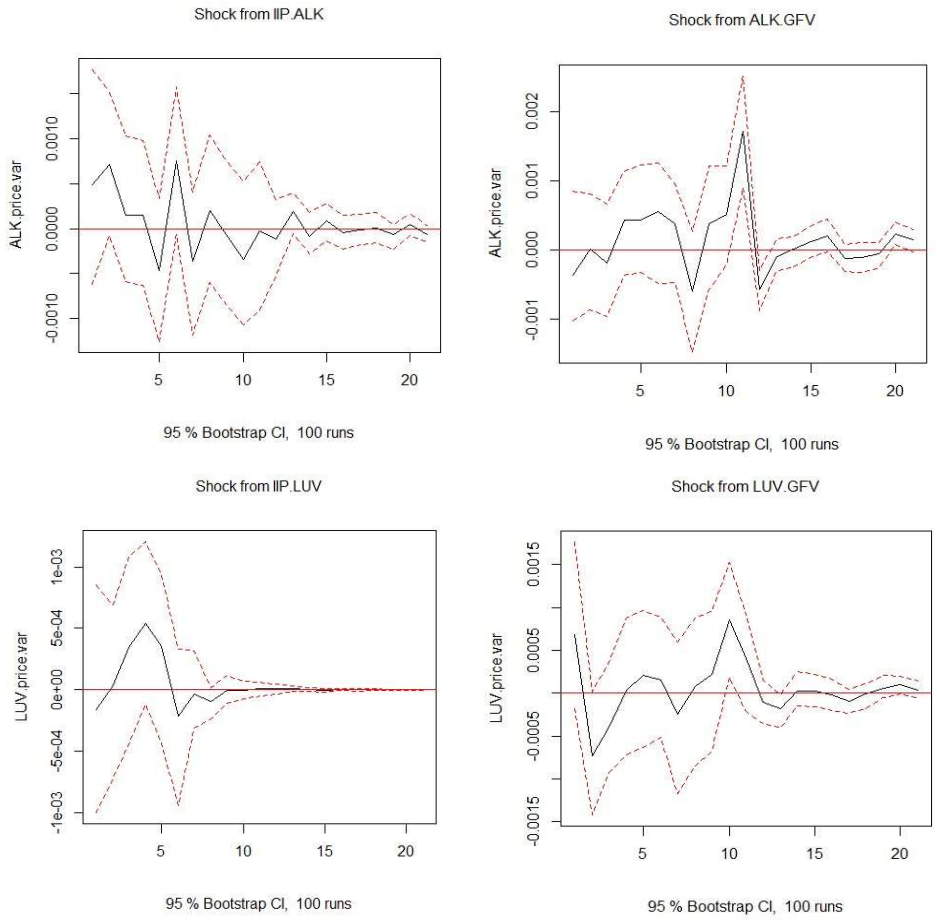


Figure 21 displays the results of the impulse response functions concerning IIP and IS for UAL and DAL. Analyzing the IIP, we observe that an initial shock positively affects the stock price for both companies, despite the confidence interval including zero. However, this initial rise is followed by a notable price correction, which does demonstrate statistical significance. This cycle continues to repeat, gradually diminishing in impact over time, but gaining statistical significance as the confidence intervals no longer include zero. A similar pattern emerges with respect to IS. This consistency leads to the conclusion that shocks to both IIP and IS have significant reflections on the future stock prices of these companies. Nonetheless, the impact of such shocks diminishes over time, as would be anticipated given the adaptive nature of the market.

Figure 20 - UAL and DAL - Impulse Response Functions

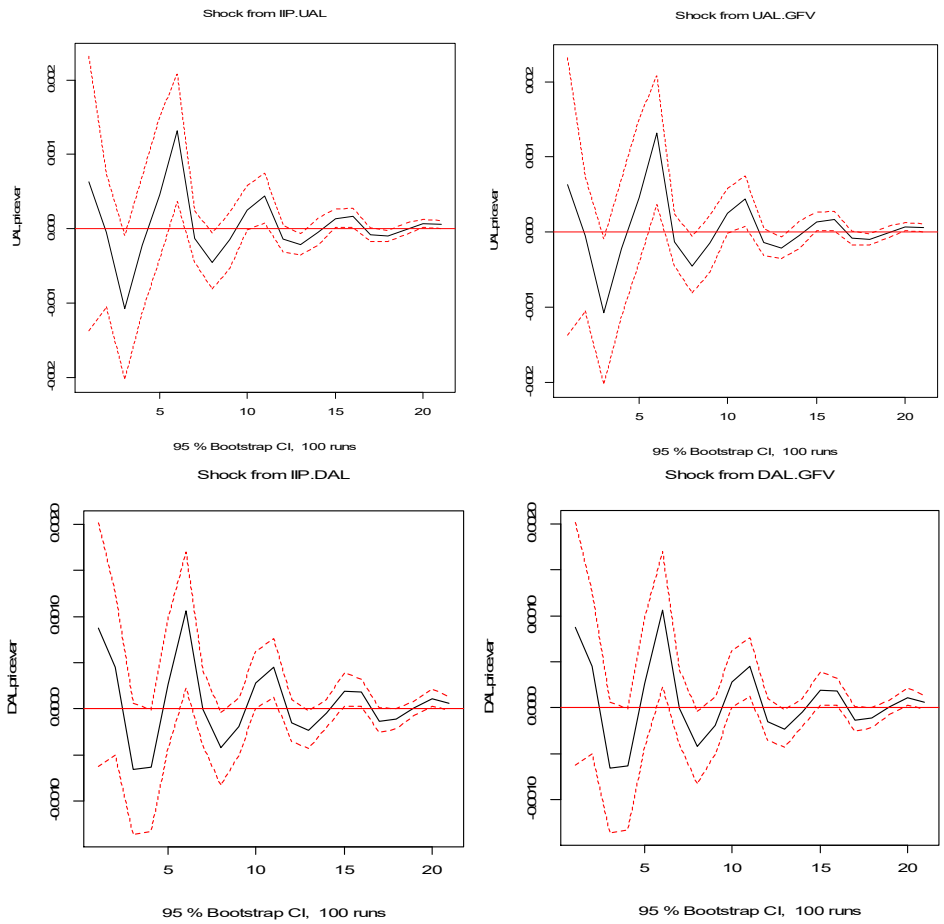
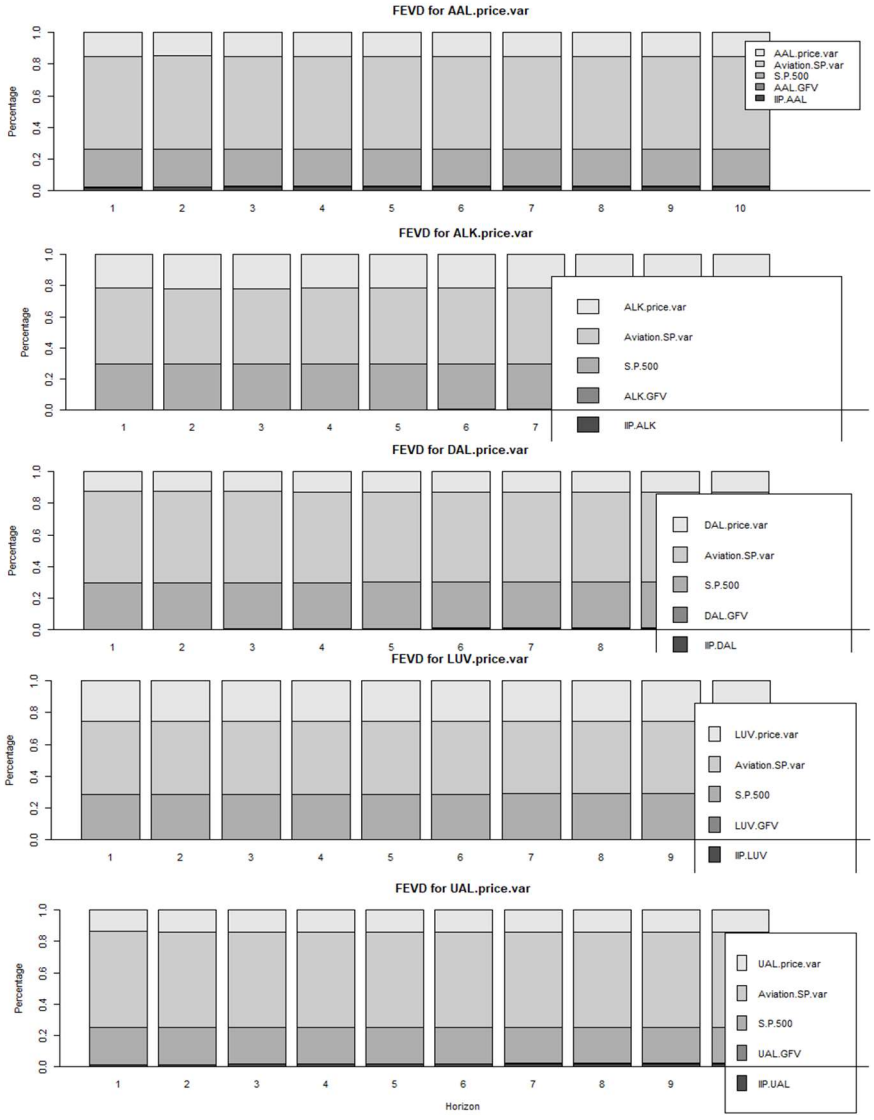


Figure 22 displays the Forecast Error Variance Decomposition for the stock price variable of each company. Notably, the forecasted price by the VAR model and its associated errors are primarily influenced by external factors such as industry price, market conditions (S&P 500), and historic prices, which is typical in time series analysis. However, for AAL and UAL, a discernible impact from IIP suggests that this variable does indeed affect stock price predictions for these two companies. Conversely, the impact of IIP is very minimal for DAL and ALK from lag 6 onward, and there is no visible impact on LUV. Similarly, IS shows minimal to no effect across all five companies.

Figure 21 - FEVD AAL, ALK, DAL, LUV and UAL



3.13. Discussion

Market trading conditions vs. individual investor's decision-making process

As seen, when Investor Sentiment is considered as the independent variable and Individual Investor Preponderance (IIP) as the dependent variable, there is a statistically significant relationship for the companies AAL, ALK, DAL, and UAL at lags 2 and 5 for AAL, lag 4 for DAL, lag 3 for UAL and lag 10 for ALK ($p<0,05$) (Table 4). As such, we can reject the null hypothesis and confirm that Investor Sentiment influences the behavior of individual investors, at least in the case of four out of the five companies studied. Hence, we confirm H1 Market trading conditions (measured in terms of investor sentiment) exert a positive influence on the decision-making processes of individual investors.

When examining the calculated coefficients, it is found that all have a positive sign and range between values of 0.019220 and 0.029200. The positive correlation indicates that an upsurge in Investor Sentiment is associated with a concomitant increase in the participation of individual investors in the market. This relationship is quantitatively assessed using the absolute value of the coefficient, which measures the robustness of the impact of Investor Sentiment on investor behavior. The empirical evidence supporting this observation aligns with prior research that has consistently reported a significant influence of Investor Sentiment on the dynamics of stock price movements (Barberis et al., 2005; Frijns et al., 2017; Kumar & Lee, 2006). These studies suggest that investor psychology can often lead to deviations in stock prices from their fundamental values, particularly during periods of high sentiment.

Fluctuations in Investor Sentiment can explain a substantial portion of price changes that remain unaccounted for by traditional financial fundamentals (Frijns et al., 2017). Thus, understanding the nuances of Investor Sentiment becomes crucial for both market participants and policymakers. It

serves as a reminder of the psychological and behavioral dimensions of investing, which can sometimes overshadow or amplify the effects of economic indicators and financial reports. As such, this area of research reinforces the need for a more holistic approach to financial market analysis, incorporating both quantitative data and qualitative sentiment measurements.

Popularity on social media vs. Positive investor Sentiment

The relationship between popularity on social media and positive investor sentiment is challenging to investigate. Our data largely corroborate previous studies (Audrino et al., 2020; Da et al., 2011), particularly in affirming that investor sentiment, does have an influence on stock prices. This influence was tested and measured using Granger Causality for three companies AAL, DAL, and UAL and was found to be statistically significant ($p<0,05$). Conversely, for the companies ALK and LUV, no statistically significant relationship was identified through our data.

To analyze investor sentiment and its relationship with popularity, we conducted an integrated analysis of the variables: social media popularity and stock price variation using the VAR (Vector Autoregressive) model. By examining the coefficients of the IS variable in the multivariate regression model, we find that they are positive and statistically significant as explanatory variables for stock price variation. It is important to note that for the company UAL, there are two lag periods with statistical significance, at lags 2 and 5. Interestingly, these lag coefficients display contrasting signs, with one being negative and the other positive, although the sum of the coefficients is positive. This suggests that the impact of social media popularity on UAL's stock prices may not be straightforward and may exhibit different dynamics at different time lags. The negative coefficient at lag 2 implies that an increase in social

media popularity may lead to a decrease in stock prices initially. However, the positive coefficient at lag 5 suggests that over a longer period, an increase in social media popularity could have a positive effect on stock prices (Table 10 - Regression Summary of Global VAR Model.

Therefore, we can confirm H2 that an increase in popularity on social media leads to an increase in Investor Sentiment. Therefore, we reject the null hypothesis for four of the five companies analyzed, and can assert that popularity on social media accurately predicts Investor Sentiment.

Individual investor preponderance vs. Stock price fluctuations

We further tested the relationship between individual investor preponderance and stock price fluctuations. The collected data confirmed a significant relationship between IPP and stock price variations. Through the use of Granger Causality analysis, we found that the relationship was statistically significant ($p<0.01$) for AAL and UAL, and at a 95% confidence level for DAL. Additionally, the results from the multi-regression VAR model supported this conclusion for DAL and UAL, although for AAL, the statistical significance slightly exceeded the threshold of 0.05 (0.050079). The computed coefficients were positive, indicating a direct linear relationship. Specifically, an increase in individual investor participation in the market was associated with a corresponding increase in stock price.

While we observed statistical significance between investor participation and stock price for AAL, DAL, and UAL, this relationship was not evident for ALK and LUV. This discrepancy requires further investigation to address the asymmetry. Nevertheless, based on the scope of this study and in general, these findings are congruent with previous studies that examined the expansion of the base of individual investors in a certain security relative to its valuation change. These studies also identified a positive

relationship whereby an increase in the number of individual investors trading a security correlates with an increase in the value of that security (Chen & Craig, 2023; Ding & Hou, 2015). However, our study delves deeper by demonstrating that the effect is not uniform across all companies. This finding is crucial as it enables the construction of an analytical framework to discern which companies experience the effect and which do not. Hence we confirm H3 There is a significant relationship between the preponderance of individual investors and stock price valuations. An increase in the trading activity of individual investors corresponds to an increase in share prices. Accordingly, we reject the null hypotheses for three out of the five selected companies.

Stock price fluctuations vs. Individual investor preponderance.

In examining the relationship between stock price fluctuations and IPP, we encounter somewhat blurred findings. The Granger causality test (Table 11 - Granger Causality Analysi) verifies this relationship as statistically significant solely for the company DAL. However, through multiple linear regression computed by Vector Auto Regression (VAR) (Table 10 - Regression Summary of Global VAR Model), we identify a statistically significant correlation for the companies AAL (lag 2), DAL (lag 2), and UAL (lag 1), which are accompanied by positive coefficients and relatively high absolute values (0.941066, 0.592482, and 0.726918, respectively). Accordingly, through the VAR methodology, we reject the null hypothesis for these three companies and conclude that fluctuations in a stock's price have direct implications on individual investors' preponderance. So, we can infer that, an increase in a company's share price typically precipitates an increased demand for that company's shares among individual investors.

These results, to some extent, corroborate earlier studies that concluded stocks receiving more media attention, particularly those highlighting their earnings, tend to attract more individual investors as buyers of the stock (Barber & Odean, 2008; Da et al., 2011). Hence, we confirm H4 that an increase

in stock price will attract more individual investors to that stock so will increase the individual investor preponderance.

The Individual Investor Journey Toolkit

Following an in-depth analysis of the outcomes for all hypothesized relationships, a statistically significant causal connection is typically found for three companies: AAL, DAL, and UAL. However, regarding ALK and LUV, the scenario deviates, with LUV demonstrating no causal relationship of statistical significance. Upon examining the specific data relating to the equity ownership across these five companies, we arrive at a key conclusion. Entities with a proportionally high presence of institutional investors (Table 12 - Equity Composition) failed to validate the model's hypotheses. In this instance, ALK and LUV remain uninfluenced by the activities of individual investors. This discovery could be crucial to the decision-making process of individual investors. In their process of stock screening, they are made aware that the shares of firms with a high concentration of institutional investors are marginally, if at all, impacted by market dynamics, most notably, Investor Sentiment, and individual investor activities. Consequently, this knowledge contributes to more informed, strategic decision-making.

Table 12 - Equity Composition

	AAL*	ALK	DAL	LUV	UAL
Individual Investors	47,19%	17,20%	29,55%	18,02%	29,71%
Institutional Investors	52,81%	82,80%	70,45%	81,98%	70,29%

This study contributes to the understanding of the individual investor's journey and underscores their growing significance within the capital markets as showed in Figure 5. By establishing an analytical framework, we identify specific company characteristics (e.g., individual and institutional weight in capital structure) that align with changes in the interests of individual investors. The framework offers a suite of analytical indicators designed to aid individual investors in making more informed investment decisions. These indicators include the Individual Investor Preponderance (IIP), which measures the degree of individual investor activity relative to total market activity; Investor Sentiment (IS), which gauges the overall mood or attitude of individual investors towards the company share; and the weight of institutional investors, which provides a comparative measure of institutional versus individual investor engagement in the market.

These indicators collectively guide individual investors not only in selecting companies for potential investment but also in making critical decisions regarding when to buy, hold, or sell their investments based on the evolution or persistence of their initial investment theses. Furthermore, these decisions are periodically revisited and potentially revised in response to the updated values of the identified indicators, ensuring that investment strategies remain aligned with dynamic market conditions and investor sentiments. By integrating such dynamic, data-driven indicators into their strategic planning, individual investors are better equipped to navigate into the Individual Investor Journey, optimize their investment portfolios, and achieve their financial objectives with greater precision and foresight.

3.14. Theoretical implications

This study significantly contributes to the understanding of the Individual Investor Journey by elucidating how fluctuations in Investor Sentiment can influence individual investors' decisions and behaviors in the market. By establishing a positive correlation between Investor Sentiment and the engagement of individual investors, this research highlights the psychological and emotional components that often govern investment decisions, beyond mere rational financial calculations (Kahneman & Tversky, 1979; Strahilevitz et al., 2011).

Firstly, the findings underscore the importance of Investor Sentiment as a pivotal factor in the investment process. By quantifying this impact through the coefficient value, the study provides empirical evidence that Investor Sentiment can lead to increased market participation among individual investors. This suggests that sentiment-driven market dynamics are intrinsic to understanding the full spectrum of factors that motivate individual investors to enter and exit the market (Berger, 2022; Kumar & Lee, 2006; Magron & Merli, 2015; You & Wang, 2023).

Secondly, this research builds upon prior studies (Baker & Wurgler, 2007; Kumar, 2009) that linked Investor Sentiment with stock price variations, thereby offering a broader perspective on how investor psychology affects market outcomes. By connecting these price variances back to the behavior and prevalence of individual investors, this study bridges the gap between micro-level investor behavior and macro-level market performance. This integrative approach is crucial for comprehending the complete journey of an individual investor, which often swings between personal sentiment and broader market trends.

Thirdly, by highlighting recent findings that Investor Sentiment accounts for price variations unexplained by traditional fundamentals (Kim et al., 2023; Renault, 2017), this study introduces a critical dimension

to the ongoing discourse on market efficiency and the rationality of market participants. It suggests that individual investors are not merely passive actors reacting to economic indicators but are significantly influenced by collective sentiment, which can occasionally lead to market inefficiencies.

Fourthly, this study enriches the discourse on the Individual Investor Journey by reinforcing the notion that understanding investor behavior requires a deep dive into psychological factors, including sentiment, emotion, and perception, which often dictate market dynamics as strongly as, if not stronger than, financial fundamentals (Barberis et al., 1998). This holistic approach is vital for anyone involved in financial markets, from individual investors to policymakers, as it emphasizes the complex, intertwined nature of financial decisions and human psychology.

Fifthly, this study makes significant academic contributions through the application and advancement of current methodologies in analyzing individual investor behavior. One notable contribution is the utilization of Google Trends data as an indicator of investor sentiment (Da et al., 2011; Ding & Hou, 2015). This addition to the toolkit of marketing finance research enhances the understanding of investor sentiment analysis across various stocks and sectors.

Sixthly, the study explores the impact of trading conditions on the decision-making processes of individual investors, offering a more detailed perspective on these dynamics. Through the analysis of individual investor preponderance, which is inferred from the number and volume of trades, and establishing correlations with the prevalence of individual investors, the research illuminates the complex interactions between trading conditions and individual investor behavior. Additionally, uncovering the variability in individual investor prevalence across different companies enhances the depth of existing knowledge and provides a comprehensive understanding of the factors influencing individual investor decisions.

Furthermore, the identification of a positive and statistically significant relationship between increased popularity and individual investor preponderance with stock price increase expands the body of knowledge in this field. This finding offers academics a broader perspective on how investor sentiment can significantly impact stock prices. Overall, this study brings valuable contributions to the field of marketing finance research and enhances our understanding of individual investor journey.

3.15. Managerial Implications

For practitioners in the field of marketing finance and investment management, this study provides robust evidence-based insights to guide strategy formation concerning individual investor journey. Recognizing the increasing role of individual investor participation in capital markets can aid in making more informed decisions about investment strategy, risk assessment, and asset management. Also, understanding the correlation between investor sentiment and stock price fluctuations offers a tangible tool for market prediction. The finding that sector-level changes have more considerable influence on individual companies' stock performance can also inform portfolio diversification decisions.

3.16. Future Research Avenues

Our research has significantly advanced our understanding of the complex dynamics that characterize the individual investor journey. By examining the individual investors preponderance and the role of investor sentiment, this study has offered substantial insights into how individual investor behaviors influence the fluctuating stock market. This research opens up promising paths for future studies, particularly through investigations focused on the effects of investor sentiment in specific companies and the incorporation of news sentiment data to provide a more comprehensive analysis of market influences.

Our first hypothesis (H1), aimed to decipher the underpinning factors influencing an individual investor's decision-making process, looking into the impact of market trading conditions defined by the number of orders, volume of trade, and investor sentiment. While our data highlighted the upward trajectories of trade numbers and volume, we recognized a rise in the individual investors' preponderance, barring 2020. Nevertheless, the company-specific variation in individual investor participation underscores the limitation of extrapolating our findings universally across firms. This variation further validates the need for more company-specific explorations to extend the generalizability of our findings.

Our third hypothesis (H3) probed the association between stock price fluctuations and individual investor participation. While our data confirms a relationship, these findings were company specific with AAL and UAL showing statistical significance at the 1% level and DAL at the 95% confidence level. The observed company-specific fluctuations reiterate the importance of customized company-level approaches in future research.

We have studied the American commercial aviation sector, which is composed of a few large companies with high market visibility. These conclusions need to be tested in other sectors and companies with different shareholder structures. For examples it would be interesting to see if findings hold if we were to apply the same methodology to the retail sector of video games (e.g.., GameStop) This line of inquiry presents a promising avenue for future research.

Overall, these insights underscore the necessity for an adaptive approach in financial practices and policy making that is cognizant of and responsive to the significant sway of individual investors and their psychological dispositions. On a final note, this study advocates for the integration of insights regarding individual investors' behavioral patterns and sentiment-driven actions into broader market analyses. Such an integrative approach promises a more complete understanding of market dynamics. Future research should aim to develop predictive models and strategic frameworks that incorporate these dimensions of the Individual Investor Journey, potentially fostering more stable and predictable market conditions.

3.17. Limitations

We have identified three major limitations in our study: Firstly, there is a geographical limitation as the study is confined to the North American capital market. Secondly, the characteristics of our sample, selected from the highly concentrated airline passenger transport sector, suggest that our conclusions need verification in other more pulverized sectors. Thirdly, the use of data from a single social media platform necessitates the measurement of sentiment across other platforms such as Social Network X and additional online forums dedicated to individual investors, to enhance the robustness of our findings.

3.18. Conclusion

Our study highlights the crucial need to understand the idiosyncratic nature of each firm as we continue to unravel the complex tapestry of capital markets, and that is the ground basis to understanding the Individual Investor Journey. This investigation significantly advances our comprehension of the Individual Investor Journey by delineating the predominant influence of individual investor preponderance on stock price variances. Through our analysis, it has been determined that the substantial investor sentiment and individual investors preponderance serve as primary determinants of stock price dynamics, effectively we observe that these investors are moving from peripheral market participants to central market influencers as we can see in the market participation increase. This elucidation not only accentuates the economic movements within the market but also brings to light the psychological evolution of individual investors as they interact with and impact the market environment.

Based on the data collected, we observed an overall increase in the number and volume of trades during the analyzed period. Additionally, we computed a variable to measure the predominance of individual investors. It is worth noting that, except for the year 2020, there was a discernible increase in the presence of individual investors in the market.

Subsequently, the research delineates the role of Investor Sentiment in modulating these stock price variances. It is posited that Investor Sentiment functions both directly and as an amplifier of individual investors' actions, thus suggesting intricate feedback loops where market sentiment and individual actions are mutually reinforcing. The empirical evidence suggests that heightened periods of sentiment lead to increased investor activity, which in turn can precipitate greater market volatility and significant

price alterations. This analysis vividly captures the cyclical nature of the Individual Investor Journey, highlighting the critical phases of vulnerability and opportunity that are driven by prevailing sentiment.

Furthermore, we introduce and compute a new variable, Individual Investor Preponderance (IIP), designed to facilitate future research on the participation of individual investors in capital markets. Prior studies have predominantly relied on the Robintrack database, which is restricted to a single stock trading company and constrained by temporal limitations. The IIP variable enables the study of individual investor participation on a global scale and incorporates up-to-date financial data, thereby expanding the accessibility and relevance of research in this area.

This comprehensive perspective illuminates the recurrent patterns within the Individual Investor Journey—wherein personal sentiment and collective market sentiment not only respond to but also influence the behaviors of individual investors.

4. Conclusion

This thesis comprises two interrelated studies: a literature review of marketing finance and an analysis of the individual investor journey. The combined execution of these studies offers a comprehensive understanding of the intricate relationship between marketing and finance, as well as the behaviors of individual investors within capital markets.

4.1. First Study Contributions

The literature review of marketing finance reveals the increasing attention given to this field of study, with a growing number of publications in recent years. There has been a shift in focus from the internal relations between marketing and finance departments to the impact of marketing on shareholder value, investor attention, and firm value. This highlights the value of marketing finance research in uncovering the intricate connections between these two disciplines and provides valuable insights into its current state and potential future developments.

The literature review has provided a comprehensive analysis of the substantial body of research on marketing-finance concept over time. This study highlights the value of marketing finance research in understanding the complex relationships between marketing and finance and provides valuable insights into its current state of the marketing finance stream of research and future developments.

This thesis uncovered substantial evidence of growing interest in marketing finance research, marked by an increasing publication rate. Initially, studies predominantly examined the interactions between marketing and finance departments within firms, but recent trends show a shift towards exploring how marketing enhances shareholder value, investor attention, and overall firm value. Our research also demonstrated the use of marketing-finance interfaces to quantify these impacts. Thus, this study

underscores the importance of marketing finance research in elucidating the intricate dynamics between marketing and finance, offering key insights into its evolution and prospective areas of study.

4.2. First Study Limitations

Despite these contributions, the research faces limitations, primarily its focus on U.S. data, specifically using the American Customer Satisfaction Index (ACSI), which may not reflect global perspectives. The variation in cultural responses to marketing efforts was underexplored. Future research should consider the shift from institutional to individual investors in equity markets, necessitating a deeper understanding of individual investor psychology and behavior. Further exploration into how marketing must adapt to suit diverse investment types across various cultures will also be crucial to comprehend the global impact of marketing strategies.

4.3. Second Study Contributions

The work of the individual investor journey sheds light on the behavior of individual investors and their decision-making processes in the capital markets. It identifies the influence of market trading conditions, such as the number of orders, volume of trade, and social media popularity, on individual investor behavior. Furthermore, it reveals the predictive capacity of social media popularity on investor sentiment and its relationship with stock prices. These findings contribute to a better understanding of individual investor preferences and offer practical implications for investment management and decision-making.

This study potentially heralds a shift in the understanding of financial markets, emphasizing the growing influence of individual investors. It could lead to more sophisticated models that integrate psychological and social dimensions into market analysis. For practitioners and regulators, understanding these

dynamics could help in crafting more effective strategies to manage market stability and investor relations. Moreover, this research paves the way for further exploratory studies into the collective actions of individual investors and their long-term impacts on market structures and behaviors.

This research highlights a paradigm shift in market dynamics fueled by the rise of individual investors who, empowered by technology and community networks, are reshaping traditional market operations. It invites a reevaluation of existing financial theories and an acknowledgement of the complex interplay between individual investor behaviors, market sentiment, and overall market performance, marking a significant advancement in the field of behavioral finance.

Our research has significantly advanced our understanding of the complex dynamics that characterize the individual investor journey. By examining the prevalence of individual investors and the role of investor sentiment, this study has offered substantial insights into how individual behaviors influence the fluctuating stock market. This research opens up promising paths for future studies, particularly through investigations focused on the effects of investor sentiment in specific companies and the incorporation of news sentiment data to provide a more comprehensive analysis of market influences.

We probed the association between stock price fluctuations and individual investor participation, and our data confirms a relationship, these findings were company specific with AAL and UAL showing statistical significance at the 1% level and DAL at the 95% confidence level. The observed company-specific fluctuations reiterate the importance of customized company-level approaches in future research.

From a global perspective, the IIP variable shows an average growth of 0.01 during the periods from 2012 to 2019 and from 2021 to 2023. However, during the year 2020, amidst the pandemic, there

was a sharp decline in the participation of individual investors in the capital markets. This suggests that during times of severe crisis, individual investors tend to overreact, which aligns with the behavioral theories proposed by De Bondt and Thaler (1985). These findings highlight the importance of considering the impact of external events, on investor behavior and market dynamics. Understanding the behavior of individual investors during times of crisis can provide valuable insights into market trends and help inform investment strategies.

Based on the data collected, we observed an overall increase in the number and volume of trades during the analyzed period. It is worth noting that, except for the year 2020, there was a discernible increase in the presence of individual investors in the market.

We find that Investor Sentiment functions both directly and as an amplifier of individual investors' actions, thus suggesting intricate feedback loops where market sentiment and individual actions are mutually reinforcing. The empirical evidence suggests that heightened periods of sentiment lead to increased investor activity, which in turn can precipitate greater market volatility and significant price alterations. This analysis vividly captures the cyclical nature of the Individual Investor Journey, highlighting the critical phases of vulnerability and opportunity that are driven by prevailing sentiment.

We introduce and compute a new variable, Individual Investor Preponderance (IIP), designed to facilitate future research on the participation of individual investors in capital markets. Prior studies have predominantly relied on the Robintrack database, which is restricted to a single stock trading company and constrained by temporal limitations. The IIP variable enables the study of individual investor participation on a global scale and incorporates up-to-date financial data, thereby expanding the accessibility and relevance of research in this area.

This comprehensive perspective illuminates the recurrent patterns within the Individual Investor Journey—wherein personal sentiment and collective market sentiment not only respond to but also influence the behaviors of individual investors.

Our study highlights the crucial need to understand the idiosyncratic nature of each firm as we continue to unravel the complex tapestry of capital markets, and that is the ground basis to understanding the Individual Investor Journey. This investigation significantly advances our comprehension of the Individual Investor Journey by delineating the predominant influence of individual investor preponderance on stock price variances.

Subsequently, the research delineates the role of Investor Sentiment in modulating stock price variances. It is posited that Investor Sentiment functions both directly and as an amplifier of individual investors' actions, thus suggesting intricate feedback loops where market sentiment and individual actions are mutually reinforcing. The empirical evidence suggests that heightened periods of sentiment lead to increased investor activity, which in turn can precipitate greater market volatility and significant price alterations. This analysis vividly captures the cyclical nature of the Individual Investor Journey, highlighting the critical phases of vulnerability and opportunity that are driven by prevailing sentiment.

4.4. Second Study Limitations

Our study exhibits three principal limitations: first, its focus is restricted to the North American capital market; second, it utilizes a sample from the concentrated airline passenger transport sector, necessitating verification of conclusions in more diversified sectors; third, reliance on a single social media platform for data suggests that expanding sentiment analysis to other platforms and forums dedicated to individual investors could strengthen the robustness of our findings.

4.5. In Summary

This thesis Emerging Dynamics in Marketing Finance: Understanding the Individual Investor Journey enhances our understanding of the complex relationship between marketing and finance and provides valuable insights into the behavior of individual investors in the capital markets. It underscores the increasing importance of marketing finance research and its relevance for individual investor management. Despite the limitations, these studies contribute significant theoretical and practical implications and lay the foundation for future research in this field.

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6. Appendix

6.1. Literature Review Data base

Ano	Título	Autores	Fonte
1987	Finance and marketing: birth of a profitable relationship	Frommelt, J. J., et al.	Healthc Financ Manage 41(12): 25-27, 30, 32.
1987	The finance/marketing interface in hospitals	Bradley, M., et al.	Health care strategic management 5(1): 11-15.
1989	Institutional Markets, Financial Marketing, and Financial Innovation - Presidential-Address	Ross, S. A.	Journal of Finance 44(3): 541-556.
1990	The Marketing-Finance Interface	Ratnatunga, J., et al.	European Journal of Marketing 24(1): 29-43.
1997	Managing Financial Variation: Insights into the Finance/Marketing Interface	Locander, W. B. and D. J. Goebel	Managerial Finance 23(10): 22-40.
1997	The Interface Between Marketing and Finance: Integrated Management in an Unstable World	Zinkhan, G. M. and F. Christian Zinkhan	Managerial Finance 23(10): 3-21.
1998	Market-based assets and shareholder value: A framework for analysis	Srivastava, R. K., et al.	Journal of Marketing 62(1): 2-18.
1998	Exploring the Brand Value-Shareholder Value Nexus for Consumer Goods Companies	Kerin Roger A. and Raj Sethuraman	Journal of the Academy of Marketing Science
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2021	The value of marketing innovation: Market-driven versus market-driving	Tang, T. Y., et al.	Journal of Business Research 126: 88-98
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2022	Bridging the marketing-finance divide: use of customer voice in managerial decision-making	Saxena, D., et al.	Qualitative Market Research 25(3): 361-382.
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6.2. Descriptive statistics from Airliners

6.2.1. American Airlines (AAL) Statistics

The correlation matrix provides insights into the associations between various variables. Notable findings include a medium positive correlation between AAL.IIP and American Airlines' stock price variation (0.128), indicating a tendency for the stock price to increase as individual investor participation rises. Additionally, there is a strong correlation (0.916) between the Aviation sector price variation and AAL price, indicating a significant positive relationship and suggesting that American Airlines' stock price tends to follow the overall trend in the aviation sector. The regression analysis reveals the following key insights: the Aviation Sector Price Variation demonstrates a substantial impact on the regression model, as evidenced by its high coefficient (1.222) and low *p-value*, indicating its strong significance in predicting American Airlines' price variation. The Individual Investors' Preponderance and AAL.IS also have positive impacts on the regression model, albeit to a lesser extent. Conversely, the S&P 500 exhibits a negative impact (-0.163).

To summarize, the findings from the statistical analysis suggest that a significant proportion of American Airlines' stock price variation can be predicted by examining variables such as Individual Investor Preponderance IIP.AAL, AAL.IS, the performance of the S&P 500, and the overall variation in Aviation sector prices.

Table 13 - Regression analysis for AAL

Regression Statistics			*Coefficients*	*P-value*
Multiple R	0,920185682	Intercept	-0,000179875	0,501343673
R Square	0,846741689	IIP.AAL	0,012449029	9,32371E-14
Adjusted R Square	0,846492691	IS.AAL	0,002887056	0,002272082
Standard Error	0,012504434	S&P 500 Δ	-0,163347623	3,21772E-09
Observations	2467	Aviation Sector price Δ	1,221991891	0

When we employ a Vector Autoregressive (VAR) model to investigate the relationship between Individual Investor Preponderance (IIP.AAL), search term popularity on Google (AAL.IS), and variation in AAL's stock price along with the S&P 500 index and Aviation Sector price variation. The estimated model yields several insightful results. Starting with the impact of IIP.AAL on itself, we observe a statistically significant negative relationship (Coefficient: -0.371931, p-value: < 2e-16), suggesting the presence of a dampening effect where high preponderance in one period dampens preponderance in the next period. Regarding the influence of search term popularity (AAL.IS) on IIP.AAL, we observe a positive, albeit statistically insignificant relationship (Coefficient: 0.018682, p-value: 0.1082). This finding suggests a possible increasing, yet not significant, role of online search activities in shaping individual investor behavior.

When we turn to the influence of IIP.AAL and AAL.IS on themselves, the model reveals negative, and statistically significant, relationships. This suggests that an increase in either variable tends to subside over time, potentially signaling fading investor interest or attention. The model's results for S&P 500 and Aviation Sector price variation variables further augment our understanding of the market and sector-level factors affecting IIP.AAL and AAL.IS. We find these effects to be predominantly insignificant, suggesting that our key variables (IIP.AAL and AAL.IS) are somewhat autonomous from broader market trends and sector-specific changes.

Overall, this analysis provides an empirical foundation for understanding the interplay of individual investors' preponderance, online attention, and stock price variations in the specific context of AAL. However, the statistical insignificance of certain relationships advises caution, and points to the potential value of in-depth investigation that might incorporate qualitative data, more granular measures, or alternative methodological approaches.

6.2.2. Alaska Airlines (ALK) Statistics

A multivariate regression analysis was then conducted, with the ALK price serving as the dependent variable. The coefficient for the IIP.ALK was 0.0015, while the ALK.IS had a negative coefficient of -0.00014. The coefficients for the S&P 500 and aviation sector price change were 0.1711 and 0.8495, respectively. However, only the coefficients for the S&P 500 and aviation sector price change were found to be statistically significant at the 5% level, as indicated by their p-values, which were virtually 0 (zero). This suggests that, on average, for every unit increase in the S&P 500 index and aviation sector price, the daily stock price of ALK increases by 0.1711 and 0.8495 units, respectively, while holding all other variables constant. The model explained approximately 78.6% of the total variation in the daily stock price change of ALK stock, as evidenced by the Adjusted R-squared value of 0.7859. Moreover, the high F statistic (2710) and its associated p-value close to zero indicate the joint significance of the predictors in explaining the variation in ALK price.

In conclusion, while IIP.ALK and IS.ALK web search popularity has a minor effect on daily stock price changes, the performance of the broader stock market (S&P 500) and overall aviation sector dynamics exert a significant impact.

Table 14 - Regression analysis for ALK

Regression Statistics			*Coefficients*	*P-value*
Multiple R	0,886706747	Intercept	-3,41774E-05	0,871610703
R Square	0,786248855	IIP.ALK	0,001508256	0,282207249
Adjusted R Square	0,785958728	ALK.IS	-0,000147013	0,759869348
Standard Error	0,011050619	S&P 500 Δ	0,171120191	1,38692E-13
Observations	2952	Aviation Sector Price Δ	0,849523547	0

When we employ a Vector Autoregressive (VAR) model to investigate the relationship between Individual Investor Preponderance (IIP.ALK), search term popularity on Google (ALK.IS), and variation in ALK's stock price along with the S&P 500 index and Aviation Sector price variation upon analyzing the

estimated coefficients from the model, it was found that the variable IIP.ALK.L1 (IIP.ALK lag 1) holds a coefficient of 5.397e-03. This result intimates that a unit increase in IIP.ALK.L1 would result in an estimated increase of 5.397e-03 in Alaska Airlines price variation, holding all the other variables constant.

Furthermore, the standard errors which serve as a measure of the statistical accuracy of an estimate are relatively small across the coefficients; a desirable characteristic indicating the precision in our estimations. In order to examine the statistical relevance of each variable in the model, the t-values and corresponding p-values have been scrutinized. The null hypothesis "stating that a variable's true coefficient equals zero" has been tested for each variable. Resulting p-values that are smaller than conventional significance levels provide evidence to reject the null hypothesis, deeming those variables as statistically significant.

6.2.3. Delta Airlines (DAL) Statistics

The Delta Airlines price variation reveals an average daily price variation of 0.0008, with a standard deviation of 0.025. The negative skewness value (-0.17) indicates left-long tails, and the kurtosis of 11.74 suggests the presence of extreme values. The correlation matrix indicates a strong positive correlation between Aviation Sector Price variation and Delta Airlines price variation (0.93), followed by Aviation Sector and S&P 500 (0.56). The other variables exhibit low correlation with each other. The regression analysis of Delta Airlines price variation as the dependent variable demonstrates an R-square value of 0.87, implying that 87% of the Delta Airlines price variation can be explained by the chosen independent variables (IIP.DAL, DAL.IS, S&P 500 variation, and Aviation Sector Price variation).

The most significant factor influencing the Delta Airlines stock variation price is the Aviation Sector Price variation, as indicated by its remarkably high coefficient value (0.98) with a p-value close to zero. This suggests that, on average, a unit change in the Aviation Sector price will affect the DAL price by approximately 0.98 units. The other variables (IIP.DAL, DAL.IS, and S&P 500) have non-significant *p-values* and are not significant predictors of Delta Airlines price variation at the 0.05 level.

Table 15 - Regression analysis for DAL

Regression Statistics			*Coefficients*	*P-value*
Multiple R	0,934459592	Intercept	0,000232309	0,175207618
R Square	0,873214729	IIP.DAL	0,000785294	0,486654701
Adjusted R Square	0,873042642	DAL.IS	-0,00022221	0,737564829
Standard Error	0,008902483	S&P 500 Δ	0,036124965	0,051629105
Observations	2952	Aviation Sector price Δ	0,977824612	0

When we employ a Vector Autoregressive (VAR) model to investigate the relationship between Individual Investor Preponderance (IIP.DAL), search term popularity on Google (DAL.IS), and DAL's stock price variation along with the S&P 500 index variation and Aviation Sector price variation. In the equation

where DAL price variation is dependent variable, the predictor variables consisted of a set of lagged variables, in this instance, S&P500 lag 5, DAL.IS lag 5, and DAL price variation lag 3 demonstrated statistical significance, suggesting that these variables can be considered as significant influences on DAL price variation. Residual standard error, Multiple R-Squared, and Adjusted R-Squared were used as goodness-of-fit metrics for the models.

When we analyze IIP.DAL as dependent variable we find that IIP.DAL lag 1, IIP.DAL lag 2, IIP.DAL lag 3, IIP.DAL lag 4 and DAL price aviation Lag 2 are statistical significative and that is an important insight to our work, The individual investor preponderance to this company is highly correlated to its past values and to the past value of the price of the stock with a lag of 2 occurrences.

6.2.4. Southwest Airlines (LUV) Statistics

The multivariate regression analysis with LUV price variation as the dependent variable, the coefficients for IIP.LUV, LUV.IS, S&P 500, and Aviation Sector price variation were found to be 0.005, -0.001, 0.141, and 0.723, respectively. While both IIP.LUV and LUV.IS exhibited slight negative impacts (-0.001 and -0.005), the S&P 500 (0.141) and Aviation Sector price Δ (0.723) showed strong positive influences. The statistical significance of the S&P 500 and the change in aviation sector price was confirmed by near-zero p-values. The Adjusted R-squared value of 0.744 suggests that approximately 74.4% of the daily stock price variation of LUV can be explained by the model. This conclusion is further supported by an F-statistic value of 2143.8, indicating overall model significance. In conclusion, this regression analysis reveals that daily stock price changes of Southwest Airlines are significantly influenced by the performance of the broader market (S&P 500) and the overall dynamics of the aviation sector price. The slight negative impact of both Individual Investor Preponderance and Google search frequency is less prominent and lacks statistical significance.

Table 16 - Regression analysis for LUV

Regression Statistics			*Coefficients*	*P-value*
Multiple R	0,862690669	Intercept	0,00025874	0,210065585
R Square	0,744235191	IIP LUV	0,005098332	0,000103927
Adjusted R Square	0,743888038	LUV IS	-0,001076263	0,148420708
Standard Error	0,010545172	S&P 500 Δ	0,140893947	1,65813E-10
Observations	2952	Aviation Sector price Δ	0,723448615	0

When we employ a Vector Autoregressive (VAR) model to investigate the relationship between Individual Investor Preponderance (IIP.LUV), search term popularity on Google (LUV.IS), and variation in LUV's stock price along with the S&P 500 index and Aviation Sector price variation. For the IIP.LUV equation, the predictors IIP.LUV lag 1, IIP.LUV lag 2, IIP.LUV lag 3, IIP.LUV lag 4, and IIP.LUV lag 5 returned a p-value less than 0.05, deeming them statistically significant. This indicates that these predictors play a crucial part in the current value of IIP.LUV.

The LUV.IS equation revealed that LUV.IS Lag 1, LUV.IS lag 2, LUV.IS Lag 3, LUV.IS lag 4 and LUV.IS lag 5 are significant predictors at the 0.05 level, suggesting their importance in forecast variation in LUV.IS. Lastly, the model for LUV price variation identified LUV price variation lag 1 and LUV price variation lag 4 as significant predictors based on their p-value. The identified predictor variables provide insights into the interdependent and dynamic relationships among these economic indicators. However, the low R-squared values indicate that the regression models explain a limited portion of the total variability, suggesting their explanatory power could potentially be improved.

6.2.5. United Airlines (UAL) Statistics

The model yields an R-squared value of approximately 87%, indicating that the chosen independent variables (IIP UAL, UAL IS, S&P 500, and Aviation Sector Price Variation) collectively explain a significant proportion of UAL Price Variation.

The ANOVA table further substantiates the statistical significance of the relationship between UAL Price Variation and the other four variables, with an F-statistic of zero indicating significant overall model significance. Examining the coefficients of the model, it is observed that IIP.UAL, UAL.IS, and Aviation Sector Price Variation exhibit positive relationships with UAL Price Variation, while S&P 500 shows a negative relationship.

However, it is important to note that the p-value for UAL.IS exceeds the standard threshold of 0.05, suggesting that its statistical significance in predicting UAL Price Variation may be weak. In conclusion, this analysis reveals important insights into the statistical characteristics and relationships among variables related to UAL stock. The findings suggest that individual investor preponderance and Google search frequency have limited impact on UAL Price Variation, while the performance of the broader market (S&P 500) and the dynamics of the aviation sector play a more significant role. However, caution should be exercised in interpreting the results due to the non-normal distribution observed in some variables, which may affect the robustness of the standard regression model.

Table 17 - Regression analysis for UAL

Regression Statistics			*Coefficients*	*P-value*
Multiple R	0,930444504	Intercept	0,000194905	0,357761227
R Square	0,865726975	IIP UAL	0,008209801	6,29694E-09
Adjusted R Square	0,865544724	UAL IS	2,63721E-05	0,975773984
Standard Error	0,011037289	S&P 500 Δ	-0,171909717	1,01973E-13
Observations	2952	Aviation Sector price Δ	1,221261332	0

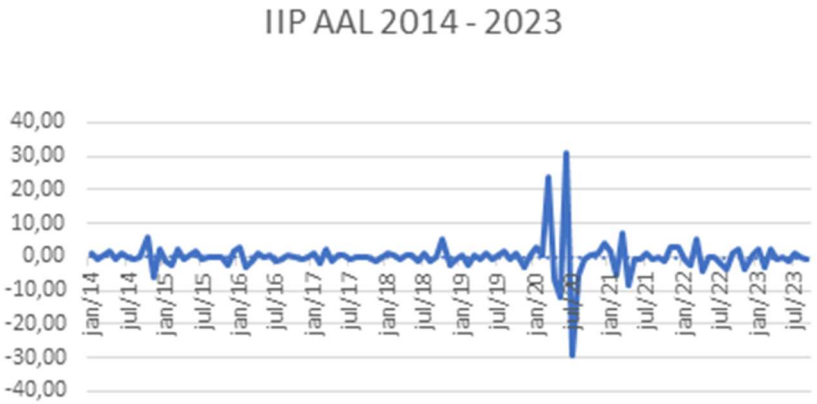
When we employ a Vector Autoregressive (VAR) model to investigate the relationship between Individual Investor Preponderance (IIP.UAL), search term popularity on Google (UAL.IS), and variation in UAL's stock price along with the S&P 500 index and Aviation Sector price variation.

The primary units of analysis incorporated in the model included indicators such as UAL.IS, UAL price variation for the parameter UAL.IS, significant predictors identified through the model encompassed UAL.IS lag 1, UAL.IS Lag 2, UAL.IS lag 3, IIP.UAL lag 4, IIP.UAL Lag 4 and UAL.IS Lag 5. The model accentuated the key role these variables play in influencing UAL.IS, underscoring their statistical significance.

In considering UAL price variation, IIP.UAL Lag 3, UAL.IS Lag 3 as the significant trace elements. The connective tissues linking these variables with UAL price variation were thus laid bare.

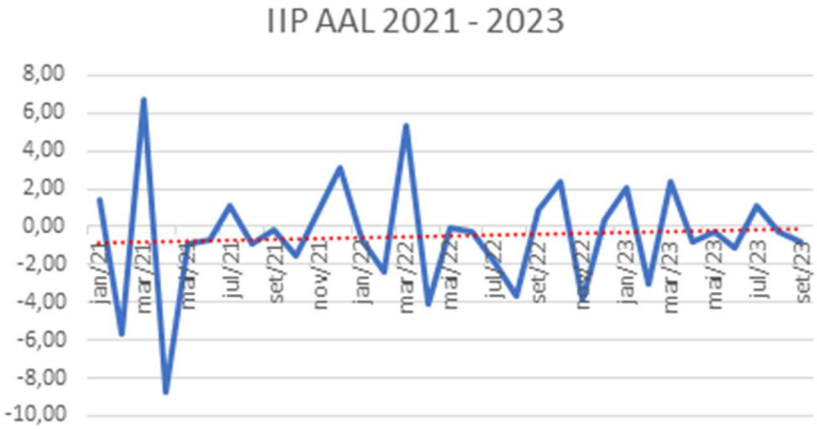
6.3. Individual Investor Preponderance (IIP) for Company

6.3.1. IIP AAL Graphs



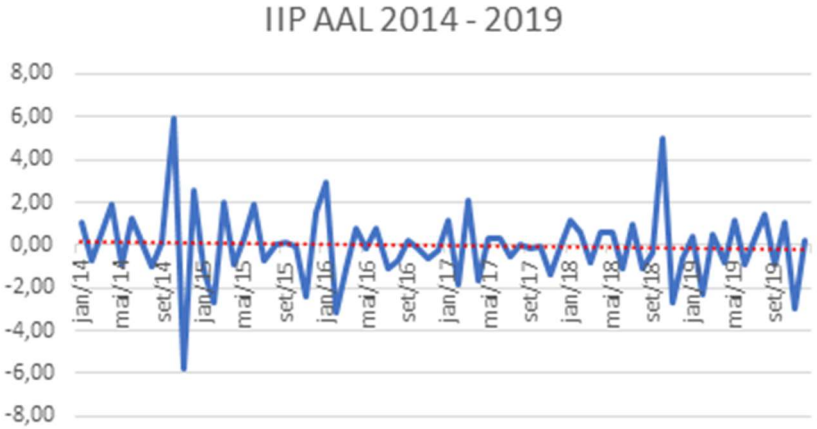
Average - -0,01

Sum -0,92



Average - -0,03

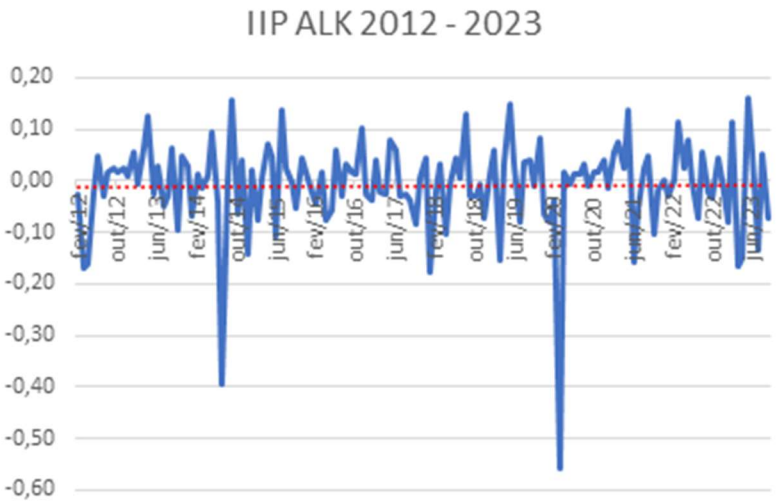
Sum -3,89



Average -0,37

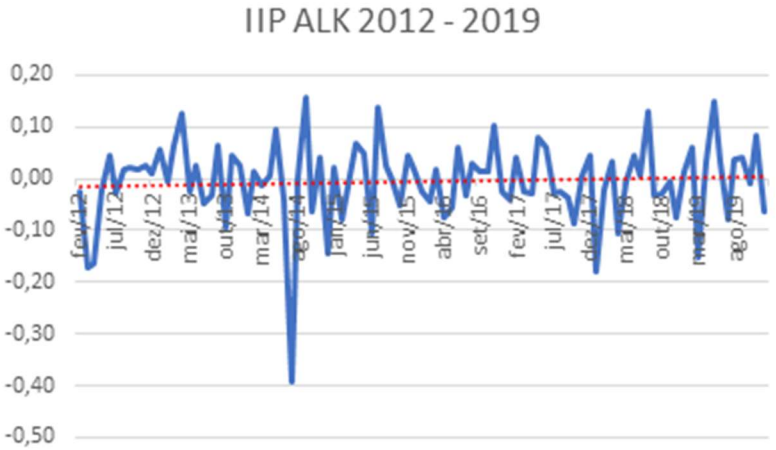
Sum -12,23

6.3.2. IIP ALK Graphs



Average -0,01

Sum -1,05



Average 0,00

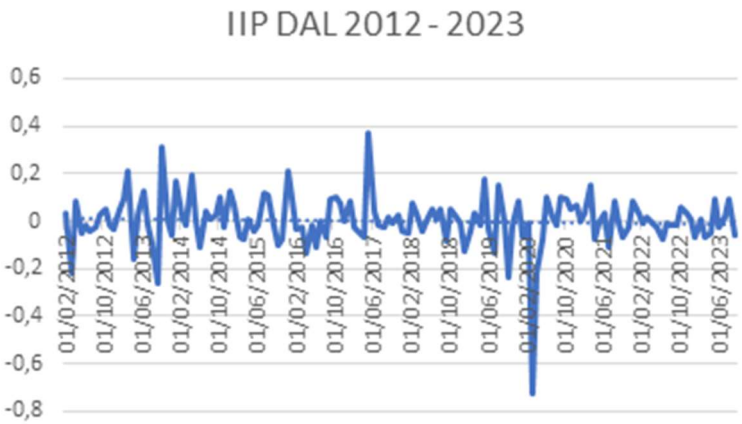
Sum -0,47



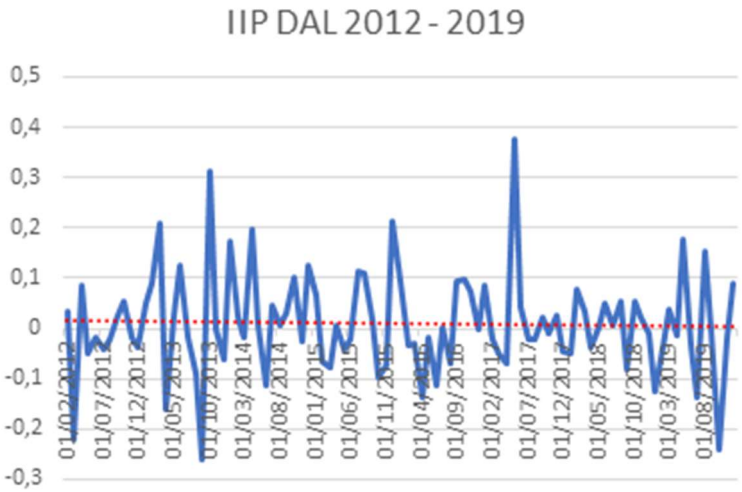
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Sum -0,04

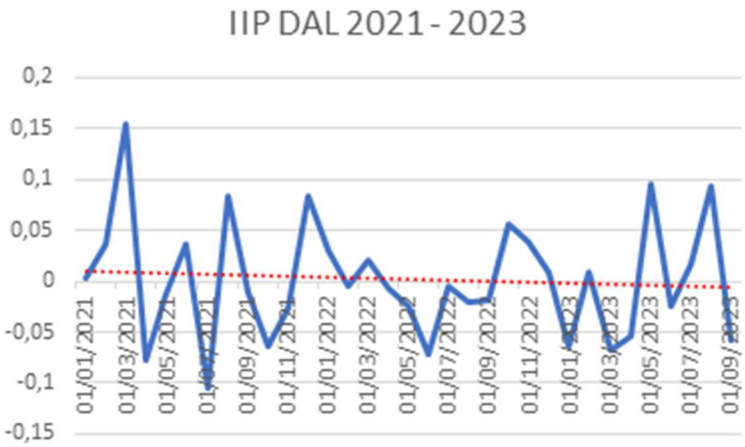
6.3.3. IIP DAL Graphs



Average	0,00
Sum	0,33

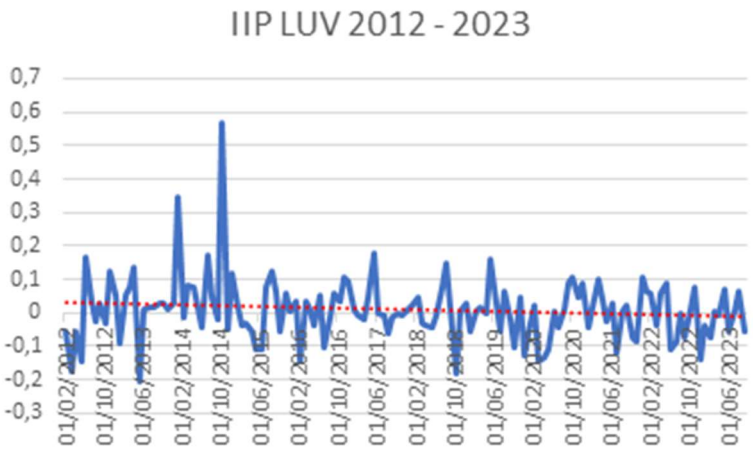


Average	0,01
Sum	0,96

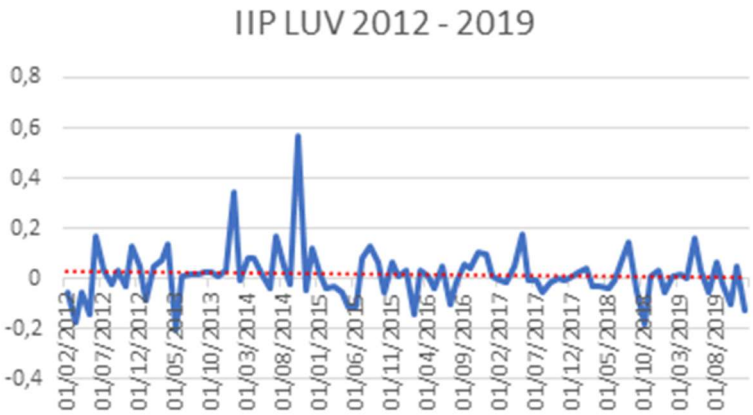


Average	0,00
Sum	0,06

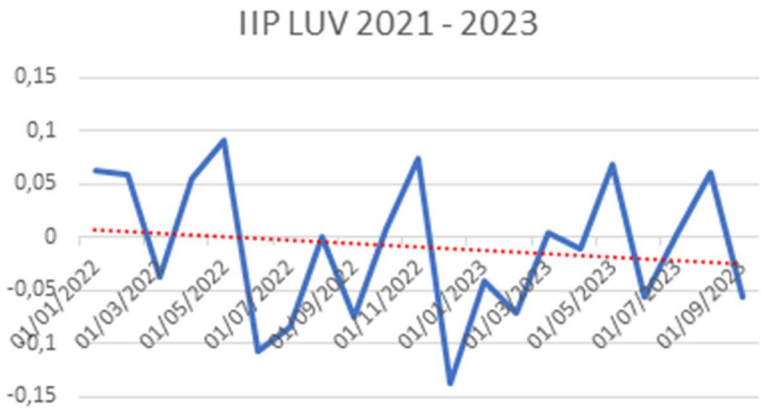
6.3.4. IIP LUV Graphs



Average	0,01
Sum	1,13

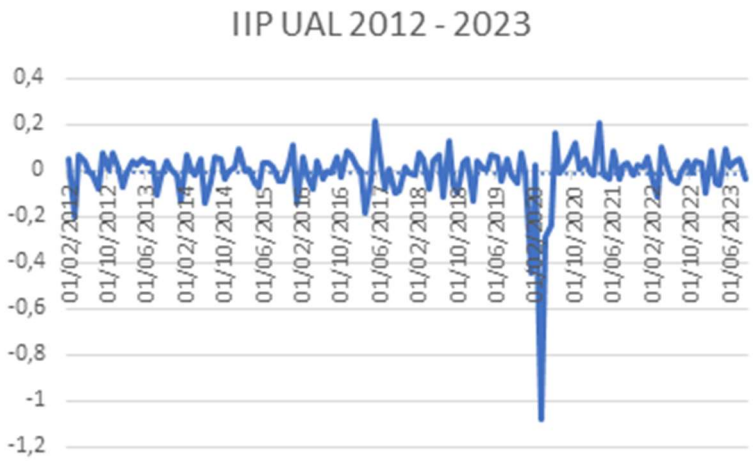


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Sum	1,44

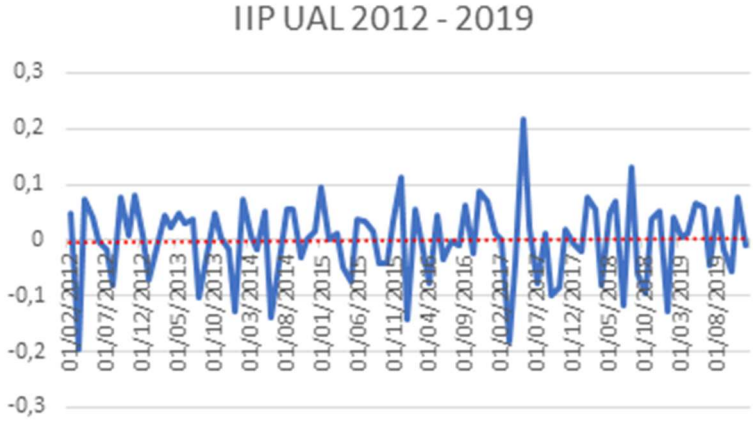


Average	-0,01
Sum	-0,21

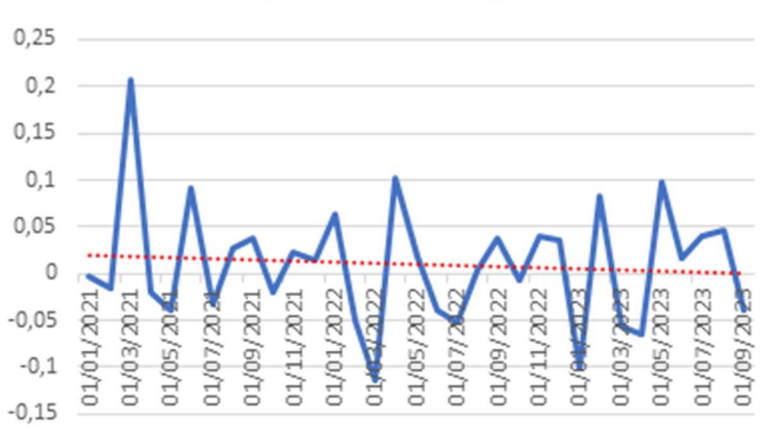
6.3.5. IIP UAL Graphs



Average	-0,01
Sum	-1,21



Average	0,00
Sum	0,05



Average	0,01
Sum	0,34