



Mapping the evolution of ethical standards in trading: A bibliometric analysis

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ABSTRACT

Amid concerns about financial social responsibility, the significance of ethical standards in trading has grown. Recent years have seen increased focus on exploring diverse ethics in trading, from fundamental principles to cutting-edge techniques. Our objective is to shed light on the state of ethics in trading through a comprehensive bibliometric analysis of 3010 research articles published between 1976 and 2022, drawing data from the Web of Science Core Collection (WoS). This analysis includes identifying publications, examining co-authorship patterns, determining top countries in scientific output, analyzing citations, exploring influential journals, and assessing keyword co-occurrence. Recurring themes mirror the academic progression of ethics in trading, especially regarding new technologies like high-frequency trading, offering insights for future research. Two standout considerations are the ethical implications of short selling in high-frequency trading and ethical management in commodity trading, linked to the evolving landscape of social responsibility in trade management.

1. Introduction

Over time, the introduction of ethical standards in trading has evolved across various levels, encompassing basic transactions and exchanges between individuals and businesses (Ballet & Carimentrand, 2010; McGee, 2008). These ethical standards are grounded in principles of fairness, honesty, and transparency, ensuring equitable treatment of parties and accurate information exchange. This ethical foundation underpins trust and cooperation in economic interactions (Koslowski, 2006).

At the level of financial markets, ethical standards hold a critical role in safeguarding the integrity and stability of these intricate systems. Both regulators and industry participants recognize the significance of ethical behavior in upholding market efficiency and safeguarding investor interests (Sun et al., 2021). Various initiatives and regulations have been put in place to promote transparency, combat insider trading, and discourage market manipulation. The objective is to foster equitable and orderly trading practices and establish a level playing field. Nevertheless, as trading practices become increasingly sophisticated and technology-driven, new ethical dilemmas emerge (Roncella & Ferrero, 2022).

A prime example is high-frequency trading (HFT), a strategy that utilizes advanced algorithms and rapid connectivity to execute numerous trades within microseconds. While HFT can enhance market liquidity and efficiency, it also raises ethical concerns. Critics

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argue that HFT may create an uneven playing field, favoring those with advanced technology and faster access to market data. This can lead to apprehensions about market fairness and the potential for market manipulation (Culley, 2020).

In practice, the adoption and adherence to ethical standards in trading are influenced by various factors. Market participants, including individuals, businesses, and financial institutions, must prioritize ethical conduct and operate within the boundaries of legal and regulatory frameworks (Rocchi & Thunder, 2019). Education and awareness play pivotal roles in promoting ethical behavior, as individuals need to comprehend the potential consequences of unethical actions and the benefits of maintaining high ethical standards. For researchers, the exploration of ethical considerations in trading is an ongoing effort (Blau et al., 2022). They seek to comprehend the complexities of market dynamics, investor behavior, and technological advancements to develop frameworks that harmonize innovation with ethical principles. This includes the investigation of potential risks and unintended consequences associated with new trading practices and the proposal of guidelines and best practices to address these concerns (Omarova & Library, 2018).

Due to the various situations that can impact the environment of financial entities, markets, and agents, it is highly relevant to explore in depth the background, key pillars, and impacts of research related to the different interacting elements (Zou et al., 2023). Over the past decade, there has been a growing number of bibliometric reviews of the literature aimed at understanding the conceptual structure of ethics in the financial sector, focusing on key determinants, challenges, opportunities, and future trends (Bui et al., 2020; Goodell et al., 2023; Naeem et al., 2023; Poje & Zaman Groff, 2022; Calandra et al., 2020; Trotta et al., 2024). Similarly, there have been several reviews in the field of research related to trading issues in the financial sector (Carè & Cumming, 2024; Dakalbab et al., 2024; Nasir et al., 2021; Shafie & Yaacob, 2022; Vuong et al., 2024). The recent increase in the number of these studies confirms the growing interest in the topic. However, while various concepts have been investigated, as noted earlier, their interaction remains undetermined and largely unexplored (Angel & McCabe, 2013; Cooper et al., 2020, pp. 1–18; Roncella & Ferrero, 2022).

The objective of this research is to analyze and underscore the key factors explored in the academic literature concerning ethics in trading and its impact on market fairness (Blunden, 2022; Klaw & Mayer, 2021; Overton et al., 2022, chap. 2; Roncella & Ferrero, 2022). By examining previous studies by scholars in this field, we can identify prominent research directions that can shape future investigations (Merigó et al., 2016; Vizuete-Luciano et al., 2023; Yu et al., 2023). To achieve this, we conducted a comprehensive analysis of both quantitative and qualitative articles, employing a range of methodologies and bibliometric tools. The bibliometric techniques used in this study encompass two primary components: the performance analysis of articles and the visualization of schemes and maps that highlight the interconnections among various factors and scientific contributors (Noyons et al., 1999). Consequently, we examined multiple dimensions to evaluate the impact of citations in scientific publications across various related factors. By integrating scientific mapping and actor analysis, this study offers a comprehensive understanding of significant scientific aspects and influential contributors in the exploration of ethical practices in trading (Blunden, 2022; Overton et al., 2022, chap. 2).

This article is organized as follows: Section 2 provides a comprehensive overview of the methodology employed in preparing this article, with particular emphasis on the execution of the bibliometric analysis. In Section 3, we present the main findings derived from the performance analysis of factors and the scientific mapping of recent literature on ethics in trading and its various forms. Lastly, Section 4 offers a summary of the key findings and conclusions drawn from the conducted analysis.

2. Methodology

For the purpose of this article, a bibliometric analysis has been conducted to gather quantitative data, examining the existing literature across various indexed reference sources. The study specifically utilized academic articles sourced from the Web of Science Core Collection (WoS) (Durán-Sánchez et al., 2017). The WoS, under the umbrella of Clarivate Analytics, encompasses multiple databases, providing reliable and well-validated information. Notably, the Science Citation Index Expanded (SCIE) houses esteemed scientific and technological publications, while the Social Science Citation Index (SSCI) comprises leading journals in the social sciences. Additionally, the Emerging Source Citation Index (ESCI) incorporates journals and articles from both the sciences and social sciences, with the potential for inclusion in the Journal Citation Reports (JCR) (Gaviria-Marin et al., 2019; Wang & Chen, 2010). The selection of the Web of Science as the primary data source for this article is justified by its extensive coverage of high-impact journals. This database is recognized for its rigor in including high-quality scientific publications, ensuring the relevance and reliability of the collected data (He & Yu, 2020). Unlike other databases, the Web of Science only counts citations of articles it indexes, which means that the quality of the citing articles is also verified (Alaminos et al., 2024; Yu et al., 2020). Additionally, the Web of Science offers advanced bibliometric analysis tools that facilitate a thorough and accurate evaluation of research trends and key contributions in the field of study (Cong & Shi, 2019; Yu & Hong, 2022). However, it is important to acknowledge the existence of other databases such as Google Scholar, Emerald Insight, and Scopus, among others, that offer alternative sources of scholarly information (Adriaanse & Rensleigh, 2013; Bakkalbasi et al., 2006).

The dataset was sourced from the Web of Science Core Collection database to ensure the highest level of reliability and encompass all available attributes. In order to gain a broader perspective on the subject matter, the inclusion criteria were set to accept articles that cover at least one of the following topics.

- Ethical trading refers to a business practice that incorporates moral and socially responsible principles into the process of buying and selling goods and services. It involves considering the impact of trade on various stakeholders, including workers, communities, and the environment. Ethical trading emphasizes fair wages, safe working conditions, sustainable sourcing, and respect for human rights. The goal is to promote transparency, accountability, and positive social and environmental outcomes throughout the supply chain, fostering a more equitable and sustainable global trade system (Koslowski, 2006).

- Ethical insider trading, also known as legal insider trading, refers to the buying or selling of a company's securities by individuals who possess material non-public information about the company. Unlike illegal insider trading, which involves the exploitation of confidential information for personal gain, ethical insider trading occurs within the boundaries of legal and regulatory frameworks (Sun et al., 2021).
- Ethical algorithmic trading involves using automated systems and algorithms in financial markets that abide by ethical principles. It ensures fairness, transparency, and responsible behavior by complying with laws and regulations, avoiding market manipulation and unfair advantages. Ethical algorithmic trading considers the impact on market stability and investor confidence, aiming to prevent disruptive practices that harm market integrity. It promotes a balance between automation and ethical conduct, fostering a fair and stable trading environment.
- Ethical high-frequency trading (HFT) refers to the use of advanced algorithms and technology to execute trades rapidly in financial markets while upholding ethical principles. It involves employing HFT strategies that adhere to legal and regulatory frameworks, promote market integrity, and ensure fairness and transparency. Ethical HFT avoids abusive practices such as front-running, market manipulation, or exploiting informational advantages. Instead, it focuses on enhancing market liquidity, improving price efficiency, and contributing to overall market stability. Ethical HFT operators prioritize risk management, invest in robust infrastructure, and comply with relevant laws and regulations to ensure that their trading activities do not harm market integrity or disadvantage other participants (Roncella & Ferrero, 2022).
- Ethical automated market refers to a trading environment where automated systems and algorithms operate in accordance with ethical principles, promoting fairness, transparency, and responsible behavior. In an ethical automated market, the algorithms are designed to prioritize the well-being of market participants and uphold the integrity of the market. Ethical considerations in an automated market involve ensuring equal access to information, preventing market manipulation, and avoiding unfair advantages. The algorithms are programmed to follow regulatory guidelines and adhere to relevant laws to prevent abusive practices such as front-running or insider trading (Roncella & Ferrero, 2022).
- Ethical broker refers to a professional intermediary in financial markets who conducts their business with integrity, transparency, and a commitment to the best interests of their clients. Ethical brokers prioritize the needs of their clients, providing unbiased advice and transparent information regarding investment opportunities, risks, and fees. They adhere to regulatory standards and guidelines, avoiding conflicts of interest and ensuring fair and equitable treatment of all clients. Ethical brokers maintain high levels of professionalism, trustworthiness, and confidentiality, operating with honesty, accountability, and a focus on long-term client relationships based on mutual respect and ethical conduct (Culley, 2020).
- Ethical market orders refer to a type of order placement in financial markets that aligns with ethical principles and promotes fairness and transparency. When placing a market order, an investor commits to buying or selling a security at the prevailing market price, without specifying a specific price limit. Ethical market orders prioritize fair execution, ensuring that the order is executed promptly and at a price that reflects the prevailing market conditions. Investors using ethical market orders avoid engaging in manipulative practices that could distort market prices or take advantage of other market participants. By prioritizing fair execution and transparency, ethical market orders contribute to maintaining the integrity of the market and fostering a level playing field for all investors (Omarova & Library, 2018).
- Ethical short selling refers to the practice of selling borrowed securities in the anticipation that their price will decrease, allowing the investor to repurchase them at a lower price and generate a profit. Ethical short selling is conducted with integrity, transparency, and respect for market integrity. It involves adhering to legal and regulatory frameworks, ensuring proper disclosure, and avoiding abusive practices. Ethical short sellers conduct thorough research and analysis, based on publicly available information, to identify overvalued securities. They do not spread false information or engage in manipulative tactics to artificially drive down the price of a security. Ethical short selling provides liquidity to the market, helps to identify mispriced assets, and contributes to price discovery, all while maintaining integrity and responsible behavior in the financial markets (Angel & McCabe, 2009).
- Ethical short positions refer to the responsible and transparent use of short selling strategies in financial markets. When taking an ethical short position, an investor borrows and sells a security with the belief that its price will decline, enabling them to repurchase it at a lower price and generate a profit. Ethical short positions are conducted in accordance with legal and regulatory frameworks, ensuring full disclosure and avoiding manipulative or abusive practices. Investors engaging in ethical short positions conduct thorough research and analysis, relying on publicly available information, to identify overvalued securities. They do not engage in spreading false information or engaging in market manipulation to artificially drive down the price. Ethical short positions contribute to market efficiency, aid in identifying mispriced assets, and promote transparency and responsible behavior in the financial markets (Angel & McCabe, 2009).
- Ethical trading strategy refers to a systematic approach to buying and selling securities in financial markets that upholds ethical principles and promotes responsible behavior. It involves integrating considerations of environmental, social, and governance (ESG) factors into the investment decision-making process. Ethical trading strategies prioritize investments in companies with strong ethical and sustainable practices while avoiding those associated with unethical conduct or environmental harm. They also consider the impact of trades on various stakeholders, including workers, communities, and the environment. Ethical trading strategies aim to generate financial returns while aligning with values such as transparency, fairness, social responsibility, and long-term sustainability, fostering a more equitable and sustainable global market system (Blau et al., 2022).

The dataset used in this study was obtained from the Web of Science Core Collection database, ensuring the inclusion of comprehensive and reliable attributes. Fig. 1 provides an overview of the bibliometric analysis conducted in this research, following the SPAR-4-SLR Protocol (Paul et al., 2021). The protocol encompasses several steps, including the identification of the research field,

data acquisition, application of filters to refine the search, and evaluation of the results. These steps have been meticulously followed to ensure the accuracy and precision of the findings presented in this study.

Similarly, the sample has been carefully refined to include only specific types of documents. This study has focused on accepting articles, articles under review, letters, and notes for analysis. Moreover, to narrow down the scope of the study to the field of ethics in trading, limits have been set by considering articles belonging to at least one of the following categories: Economics, Business Finance, Social Sciences Mathematical Methods, Mathematics Interdisciplinary Applications, Management, and Business & Other Social Science Categories. Furthermore, documents published after the date 12/31/2022 have been excluded. This decision was made because most of these documents are either still undergoing revisions or in the process of being published, making it difficult to determine their true impact and relevance at this stage.

Various authors have proposed several techniques for conducting bibliometric studies (Cobo et al., 2015; Donthu et al., 2021; Merigó et al., 2018; Vizuete-Luciano et al., 2023). Quantitative analysis has been commonly employed in the study of literature, although in recent years, there has been an increasing trend towards the use of scientific mapping in bibliometric studies. By utilizing both of these techniques, we can ensure greater rigor and precision in analyzing the various aspects of the study discussed in this article (Cobo et al., 2012; Waltman et al., 2010).

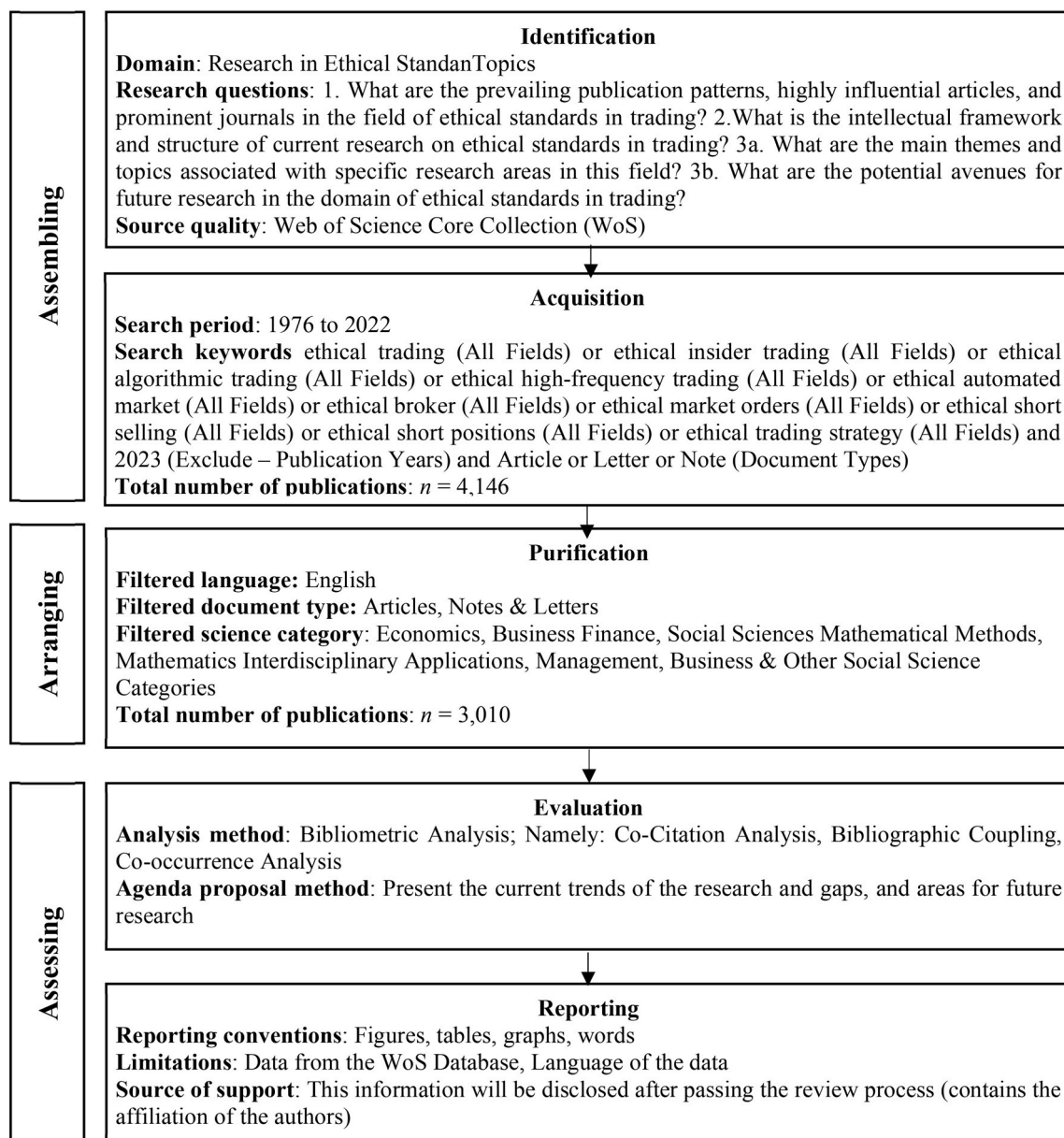


Fig. 1. Procedure of the study based on the SPAR-4-SLR Protocol.

This study utilizes various indicators to conduct a thorough performance analysis. The primary indicators include the number of publications and the corresponding number of citations received by these publications. Additionally, other valuable information has been extracted from the databases (Kong et al., 2020). To measure the influence of citations in academic articles by individual authors, indicators such as the h-index have been employed, which assesses the impact of articles based on a citation threshold (Bornmann et al., 2009; Norris & Oppenheim, 2010). Other benchmarks, such as the i10-index and g-index, have not been utilized in this study. The influence of different authors, journals, universities, and populations has been examined. To evaluate the university category, two rankings have been employed: Academic Ranking of World Universities (ARWU) and the Quacquarelli Symonds World University Ranking (QS) (Baier Fuentes et al., 2021).

In order to gain a more comprehensive understanding of the bibliographic structure and the mentioned topics, scientific mapping has been employed. This approach enables the visualization of connections within the scientific research landscape (Cobo et al., 2014; López Belmonte et al., 2020; Van Raan, 2014). Various software tools are available for conducting bibliometric studies, and for this particular study, the VOSviewer tool has been utilized to create the science mapping (Purwayadi, 2020; Van Eck & Waltman, 2010).

As this study is based on previous publications, it is important to acknowledge that the data utilized in this article may undergo slight modifications over time, particularly for more recent publications (Auer & Tercero-Lucas, 2022). Similarly, there can be certain limitations when conducting a study based on the analysis of publication results and scientific mapping. Although bibliometric studies provide valuable quantitative information about research trends, the quality of the databases used and the quantitative nature of the analysis can limit the depth of the conclusions (Martínez-Lopez et al., 2018). The number of citations does not always reflect the quality or the real impact of the research, just as the number of publications by an author, journal, or institution does not necessarily indicate their true influence. Additionally, it is important to consider the proliferation of predatory journals, which publish articles without proper peer review and accept low-quality works in exchange for publication fees (Akça & Akbulut, 2021). These practices can artificially inflate the number of publications and citations, further distorting the perception of the quality and impact of the research (Krawczyk & Kulczycki, 2021). These limitations could be addressed by using other methodologies, such as the TCCM model (Theory, Context, Characteristics, Methodology) or SLR (Systematic Literature Review), which apply learning based on the content of each article. The TCCM model allows for a deeper and more structured analysis by considering different dimensions of the studies, while SLR provides a comprehensive and rigorous approach to identifying, evaluating, and interpreting all relevant research available on a particular research question (Rahman et al., 2024; Shamsudheen et al., 2024; Tripathi, 2023).

3. Bibliometric performance

3.1. Publications and citation structure

By analyzing the figures provided (Figs. 1 and 2), we can observe the emergence of concerns regarding ethics in financial markets and the evolution of publications over time. The topic of ethics in financial markets first appeared in research papers during the mid-1970s, and its presence has steadily increased since then. Certain years stand out as particularly noteworthy in terms of publication output, indicating a growing interest and attention to this subject matter.

A total of 129 papers were published until the beginning of the 21st century, indicating a relatively low volume of academic contributions during that period. However, the pace of publication significantly accelerated afterwards, culminating in a total of 274

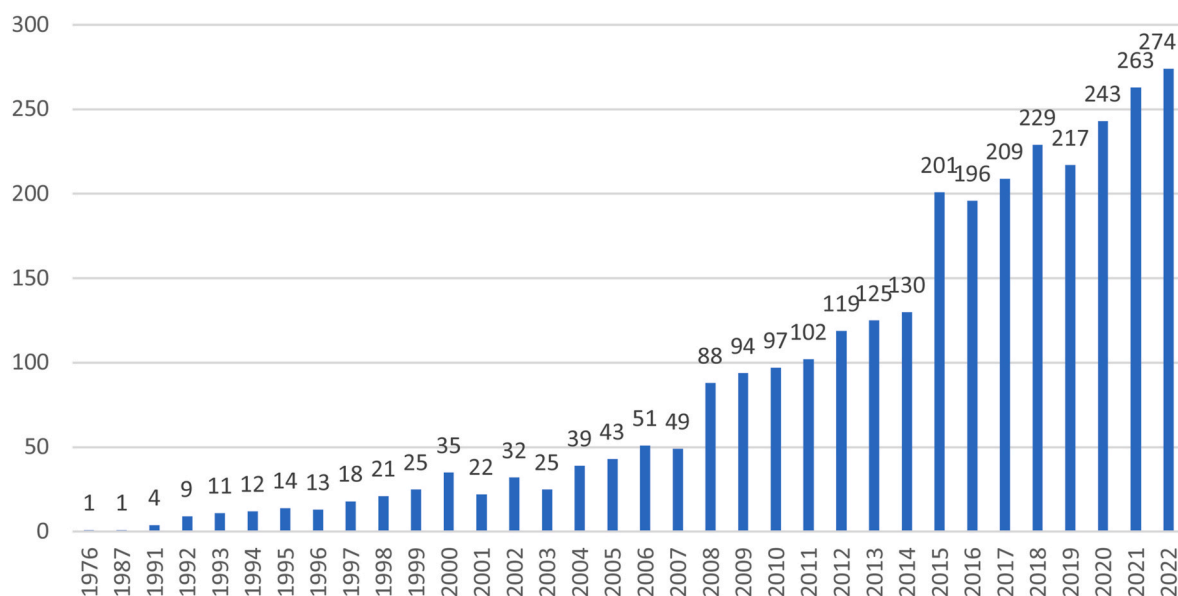


Fig. 2. Annual number of papers published by year.

papers in 2022. In Fig. 1, certain years stand out prominently due to the stark visual contrast they create in the graph, suggesting a significant increase in research output and highlighting their noteworthy contribution to the topic.

In Table 1, a significant difference in the number of publications becomes evident starting from 2008. This surge in publications coincides with one of the most severe financial crises in the global economy. The financial markets were profoundly impacted by the Collapse of Lehman Brothers, a major investment bank that declared bankruptcy, triggering widespread panic in financial markets. Simultaneously, the Subprime Mortgage Crisis reached its boiling point, rendering all the subprime mortgages worthless as the housing market collapsed, resulting in substantial losses for investors. These events culminated in a global stock market crash, prompting governments worldwide to intervene in financial markets in an effort to stabilize the situation. These interventions included monetary stimulus measures such as interest rate cuts and the implementation of quantitative easing programs. Another notable peak in publications occurred in 2015, with a total of 201 articles, marking a significant increase of 71 publications compared to the previous year, representing the largest year-on-year increment. This notable surge in articles can be attributed to various financial shocks that occurred worldwide during that year. One major event was the massive sell-off in China's stock market in June, which resulted in a crash of the Shanghai Composite Index. Additionally, in July, the Greece debt crisis unfolded, leading to the closure of Greek banks for several weeks. Furthermore, in September, the Volkswagen cheating emissions scandal for diesel cars came to light, generating widespread attention and scrutiny (Farag et al., 2015; Rhodes, 2016). These events sparked significant interest and research in the field of finance, leading to a substantial increase in publications during that year.

The years 2008 and 2015 witnessed substantial volatility and uncertainty in the financial markets, capturing the attention of the public and sparking numerous debates regarding the ethical practices of global institutions and corporations. These periods of financial turbulence prompted critical examinations of ethical conduct, with concerns raised about the actions and decisions of major players in the financial sector (Roncella & Ferrero, 2022).

After a thorough analysis of the overall citation count for these papers, it becomes evident that they did not initially have a substantial impact or generate significant interest in the scientific community or society until the mid-2000s. Nevertheless, some articles of that period have been better recognized and cited over the years, such as *the Ethical Decision-Making - A Review of The Empirical Literature* of Ford, R and Richardson, W (1994). Starting in 2014, there was a notable upturn in the number of citations for these papers, with the count rising from nearly a thousand per year to over a thousand. This positive trend continued, accumulating more than 500 citations annually. By 2021, the recognition and impact of these papers had steadily grown, resulting in a substantial total citation count of 8659 for that year.

Table 1
Annual citation structure on Ethics in Trading.

Year	TP	TC	≥200	≥150	≥100	≥50	≥20	≥10	≥5	≥1
1991	4	1	0	0	0	0	0	0	0	1
1992	9	2	0	0	0	0	0	0	0	2
1993	11	11	0	0	0	0	0	0	0	6
1994	12	11	0	0	0	0	0	0	0	9
1995	14	13	0	0	0	0	0	0	0	9
1996	13	22	0	0	0	0	0	0	0	12
1997	18	35	0	0	0	0	0	0	3	13
1998	21	52	0	0	0	0	0	1	1	23
1999	25	71	0	0	0	0	0	1	2	31
2000	35	128	0	0	0	0	0	2	1	55
2001	22	113	0	0	0	0	0	1	2	57
2002	32	140	0	0	0	0	0	1	4	68
2003	25	202	0	0	0	0	0	2	7	82
2004	39	209	0	0	0	0	0	1	7	94
2005	43	346	0	0	0	0	0	2	14	124
2006	51	457	0	0	0	0	2	4	19	135
2007	49	616	0	0	0	1	1	5	26	168
2008	88	842	0	0	0	1	4	8	32	198
2009	94	1038	0	0	0	0	4	15	47	239
2010	97	1348	0	0	0	1	5	20	56	250
2011	102	1624	0	0	0	1	6	20	72	339
2012	119	1919	0	0	0	1	7	31	85	376
2013	125	2431	0	0	0	2	11	37	108	424
2014	130	2779	0	0	0	2	15	37	113	492
2015	201	3330	0	0	0	6	16	45	129	577
2016	196	3840	0	0	0	6	19	49	165	608
2017	209	4172	0	0	0	5	20	59	163	725
2018	229	5022	0	0	0	8	27	62	219	801
2019	217	6219	0	0	1	8	37	91	230	934
2020	243	7236	0	0	2	8	47	104	261	1064
2021	263	8659	1	0	2	11	49	127	301	1153
2022	274	8261	1	0	0	7	56	113	264	1495
Total	3010	61149	2	0	5	68	326	838	2331	10564
Percentage	100,00%	100%	0,01%	0,00%	0,04%	0,48%	2,31%	5,93%	16,49%	74,74%

TP = total publications, TC = total cites, ≥XXX = accumulated cited by article produced in the year.

Analyzing Table 1, we observe a positive correlation between the increase in citations and the number of articles written on ethics in financial markets over the years. This indicates a growing interest and recognition of the topic. Notably, years marked by global and regional crises, such as the sovereign debt crisis in Europe around 2013 or the Covid-19 pandemic in 2020, further intensified the interest and research in this area. These events served as catalysts for discussions and debates surrounding ethics in financial markets, leading to an increased publication output and subsequent citations.

3.1.1. Influential papers

After careful analysis of Table 1 and it has been determined that a cumulative total of 3010 articles have been published over the past 31 years, focusing on the subject of Ethics in Financial Markets and Trading. These articles have not only contributed to the existing body of knowledge but have also served as a reference for subsequent authors who have delved into the same concept. Given the significance of these articles, it is crucial to identify and examine the most influential scientific works that form the foundation of this field of study. By understanding the basis of this scientific area of interest, we can gain valuable insights into the evolution and development of ethical considerations within financial markets and trading.

Table 1A, in appendices, provides a comprehensive list of the 50 most cited articles, as gathered by the Web of Science Core Collection, pertaining to the topic of Ethics in Trading. The table includes essential details for each article, such as the title, author(s), publication year, total number of citations (TC), and average number of citations per year (C/Y). These metrics serve as indicators of the impact and enduring relevance of these influential works in the field. By examining this table, we can gain valuable insights into the seminal articles that have significantly contributed to the study of ethics in financial markets and trading.

The most cited article up to now is “How Business Schools lost their way” by Bennis, W. G and O’Toole, J which written in 2005 and with a total number of 1089 of citations until the present date. This article examines the shift in focus within business schools, where there has been a transition from fostering a well-rounded education to prioritizing the development of graduates solely focused on financial gains. The authors argue that this shift has resulted in a neglect of ethical values, social responsibility, and leadership qualities in business students, with an excessive emphasis on technical skills and maximizing shareholder value. According to Bennis and O’Toole, this change in orientation has contributed to a narrow and short-sighted perspective on business, which, in turn, has played a role in the occurrence of financial crises and ethical scandals that have impacted the business world. They propose that business schools should redirect their attention towards cultivating leaders who can effectively balance profit-seeking with the consideration of broader societal and environmental needs.

In the 13th place we can find the article written by Huisinigh, Zhang, Moore, Qiao and Li, The article titled “Recent advances in carbon emissions reduction: policies, technologies, monitoring, assessment and modeling” has garnered a total of 221 citations and an average of 7.13 citations per year. The paper focuses on the progress made in 2015 regarding the reduction of carbon emissions, with particular attention to policies, technologies, monitoring, and assessment. The article begins by highlighting the urgent need to reduce carbon emissions in order to mitigate the adverse effects of climate change. It provides an overview of different approaches to carbon emissions reduction and emphasizes the significance of this endeavor. The authors then delve into an examination of key policies, regulations, and cutting-edge technologies that have been implemented to tackle carbon emissions. They discuss various measures,

Table 2
Top 25 Leading authors in Ethics in Trading.

Rank	Authors	Organization	TP	TC	H-index	TC/TP	≥100	≥50	≥10
1	Hughes, A.	Newcastle University	12	388	8	32,33	1	2	5
2	Bek, D.	Coventry University	10	143	7	14,30	0	0	5
3	Laurila, A.	Uppsala University	8	190	8	23,75	0	0	7
4	Mcewan, C.	Durham University	8	135	6	16,88	0	0	5
5	Richner, H.	University of Bern	8	227	6	28,38	1	0	4
6	Ruwanpura, K. N.	University of Gothenburg	8	242	7	30,25	0	2	5
7	Barrientos, S.	University of Manchester	6	599	4	99,83	2	2	0
8	Krama, T.	University of Daugavpils	6	174	5	29,00	0	1	4
9	Rantala, M. J.	University of Turku	6	174	5	29,00	0	1	4
10	Caracciolo, F.	University of Naples Federico II	5	58	4	11,60	0	0	3
11	Davies, I. A.	University of Strathclyde	5	400	5	80,00	1	3	1
12	De Pelsmacker, P.	University of Antwerp	5	845	4	169,00	2	1	0
13	Floridi, L.	University of Oxford	5	128	4	25,60	0	1	3
14	Hale, A.	University of London	5	183	5	36,60	0	1	4
15	Hamm, U.	Universitat Kassel	5	284	5	56,80	1	0	3
16	Macdonald, D. W.	University of Oxford	5	122	4	24,40	0	1	2
17	Samuel, A.	Cardiff University	5	20	2	4,00	0	0	1
18	Antonetti, P.	NEOMA Business School	4	305	4	76,25	1	1	2
19	Barnett, C.	University of Exeter	4	667	4	166,75	2	2	0
20	Becchetti, L.	University of Rome Tor Vergata	4	68	2	17,00	0	1	1
21	Bitsch, V.	Technical University of Munich	4	9	2	2,25	0	0	0
22	Buttle, M.	Newcastle University	4	134	4	33,50	0	1	2
23	Carrington, M. J.	The University of Melbourne	4	1024	4	256,00	2	1	1
24	Chatterjee, S.	State University of New York (SUNY) Binghamton	4	26	2	6,50	0	0	1
25	Clarke, N.	University of Southampton	4	667	4	166,75	2	2	0

TC/TP: Total Citations/Total Productions.

including the implementation of carbon pricing mechanisms.

The article was published in 2015, coinciding with the Volkswagen cheating emissions scandal involving diesel cars. This connection highlights the substantial significance of the issue during that year and allows us to grasp the profound impact that deceiving information of this nature had on the reputation of a company like Volkswagen.

We can highlight a recent article that has garnered a significant number of citations, reaching a total of 144. The paper “Economic, social and political issues raised by the COVID-19 pandemic” by Tisdell, C. A. This article, published in 2020, presents a comprehensive examination of the far-reaching consequences of the COVID-19 pandemic and emphasizes the importance of global cooperation to address the numerous challenges it has presented. It delves into the social impact of the pandemic, including disruptions to education systems, effects on mental health, and the rise in domestic violence, among other factors. The article also explores the political implications, discussing the role of governments in responding to the crisis and the potential impact on democratic principles and civil liberties (Tisdell, 2020). This highlights the significant ethical responsibilities faced at all levels, from large institutions to individual decision-making, during a situation that posed unprecedented difficulties for everyone, including teachers, healthcare workers, and individuals in their homes.

In conclusion, these articles stand out as the most cited and influential works in the field of ethics in trading. The consistent high number of citations per year indicates their enduring importance and relevance within the scientific community, highlighting their ongoing impact on the study of ethical considerations in trading.

3.1.2. Leading authors on topics

In Table 2, we can examine the top 25 authors who have made significant contributions to the field of Ethics in Trading. The table provides their rank, names, affiliated organizations, the total number of papers they have written on this subject (TP), the total number of citations of their papers (TC), their respective h-Index, which measures the impact of a scientist’s research output in a specific field (Norris & Oppenheim, 2010), and the ratio of citations per article. This information gives us valuable insights into the productivity, influence, and impact of these authors’ work in the domain of Ethics in Trading.

Upon analyzing the table, we can observe notable patterns in the authors’ contributions to the subject of Ethics in Trading. Hughes, A. emerges as a highly prolific academic, with a total of 12 articles and an average of 32.33 citations per article. Despite this, their h-index stands at 8. Following closely behind is Bek, D., who has authored 10 papers and received a total of 143 citations. A particularly interesting case is Carrington, M. J., who has published only 4 articles but has garnered the highest number of citations among the listed authors. With a remarkable total of 1024 citations, Carrington averages an impressive 256 citations per article. In contrast, De Pelsmacker has amassed a total of 845 citations from just 5 published papers. This analysis reveals that there is no clear correlation between the total number of papers written by an author and the number of citations received. It suggests that the impact of individual papers plays a more significant role in determining citation counts than the overall quantity of publications.

Furthermore, the authors in this field represent a diverse range of countries, indicating a global interest in Ethics in Trading. However, upon closer examination, it becomes apparent that organizations based in the United States and England are most frequently represented among the affiliations of these authors. In summary, the table provides valuable insights into the productivity, impact, and geographic distribution of authors contributing to the field of Ethics in Trading.

3.1.3. The most productive and influential institutions

In Table 3, we are presented with the 20 most productive and influential institutions in the field of Ethics in Trading. These institutions have demonstrated a strong commitment to collaborative research in this area, reflecting the growing interest and

Table 3
The Most productive and Influential institutions.

Rank	Organization	Country	TP	TC	H	TC/TP	≥100	≥50	≥10	ARWU	QS
1	University of London	United Kingdom	99	2766	28	27,94	5	10	36	201–300	125
2	University of Oxford	United Kingdom	68	1533	22	22,54	1	9	28	7	4
3	Harvard University	United States	39	1327	16	34,03	3	7	10	1	5
4	University of British Columbia	Canada	32	1063	18	33,22	4	3	16	40	47
5	Newcastle University UK	United Kingdom	30	627	14	20,90	1	2	15	201–300	122
6	University of Manchester	United Kingdom	28	911	11	32,54	3	2	7	35	28
7	University of Toronto	Canada	28	676	12	24,14	2	1	10	22	34
8	University of Edinburgh	United Kingdom	27	476	13	17,63	0	2	15	38	15
9	University of Birmingham	United Kingdom	25	896	15	35,84	2	2	13	101–150	91
10	University of Melbourne	Australia	25	1455	13	58,20	3	3	9	33	33
11	Monash University	Australia	24	306	9	12,75	0	1	8	80	57
12	University of Sydney	Australia	24	527	14	21,96	0	3	10	69	41
13	University College London	United Kingdom	23	581	12	25,26	1	2	9	17	8
14	University of Cambridge	United Kingdom	23	535	13	23,26	0	4	12	3	2
15	Durham University	United Kingdom	22	378	10	17,18	0	1	9	301–400	92
16	Ghent University	Belgium	21	916	11	43,62	1	0	11	71	143
17	University of Copenhagen	Denmark	20	613	11	30,65	2	0	10	30	82
18	University of Southampton	United Kingdom	20	877	13	43,85	2	5	7	151–200	78
19	Uppsala University	Sweden	20	826	12	41,30	2	0	12	78	128
20	Georgetown University	United States	19	338	9	17,79	1	1	7	201–300	281

significance of the subject in recent years. The uncertainties experienced in the global context and the expanding human population have prompted these institutions to allocate substantial time and resources to contribute to the body of knowledge in this field. The institutions listed in Table 3 have distinguished themselves through the quality and impact of their research. Their dedication to studying the ethical dimensions of trading has allowed them to emerge as influential contributors in the field. Their collective efforts have advanced our understanding of the ethical considerations and implications within the realm of trading.

The table presented in this study offers a comprehensive summary of various indicators, including the total number of papers (TP), total citations (TC), the institution h-index (H), and the ratio of total citations to total articles (TC/TP). Furthermore, it includes a counter for articles with over 100, 50, or 10 citations, providing valuable insights into the research's impact.

Additionally, to evaluate the level of commitment of the most esteemed institutions in this field of study, the table includes assessments of institutions from respected international rankings such as the Academic Ranking of World Universities (ARWU) and the Quacquarelli Symonds World University Ranking (QS).

To begin the analysis of Table 3, we focus on the top three institutions. Leading the way is the University of London, demonstrating its significant impact in this field with an impressive track record of 99 published papers and 2766 total citations. Following closely behind is the University of Oxford, securing the second position with 68 published papers and 1533 citations. Lastly, Harvard University claims the third position, with 39 written and published papers accumulating a total of 1327 citations, highlighting its influential role in this area of study.

The analysis of institutions that have made significant contributions to this subject highlights the presence of prominent entities from North America and Oceania. Institutions such as the University of British Columbia and the University of Toronto from North America have published a total of 32 and 28 papers, respectively, with h-indices of 18 and 12. On the other hand, the University of Melbourne stands out with an impressive total citation count of 1455 and an outstanding 58.2 citations per paper, earning it the top position in this aspect. Another noteworthy institution from Oceania is the University of Sydney, which has contributed 24 articles to the field.

Additionally, the ranking includes notable institutions from the European Union, such as Ghent University in Belgium, the University of Copenhagen in Denmark, and Uppsala University in Sweden. These institutions have demonstrated remarkable influence in the field, highlighting the global significance of their contributions.

Taking a general perspective of the ranking, it is evident that 50% of the most influential institutions hail from the United Kingdom, signifying its prominent presence in the field. Australia also stands out, with 15% of the most influential institutions in the research area, represented by three notable institutions.

Analyzing the Academic Ranking of World Universities (ARWU) and Quacquarelli Symonds World University Ranking (QS), it becomes evident that a significant number of top-ranked universities have made notable contributions to research in the field of ethics in trading. Notably, 10 institutions that publish on this subject are positioned within the top 50 of the ARWU, with two of them securing top positions. Harvard University holds the first place, while the University of Cambridge ranks third. Similarly, the QS ranking includes nine universities within its top 50, with three of them positioned in the top 5. The University of Cambridge takes the second position in both rankings, while the University of Oxford is placed fourth. Notably, there is a discrepancy between the rankings regarding Harvard University, with ARWU ranking it first and QS ranking it fifth. This variation highlights the dynamic nature and

Table 4
The Most productive and Influential Countries.

Rank	Country	TP	TC	H	TC/TP	≥100	≥50	≥10	Population	TP/POP	TC/POP
1	United States	182	3678	33	20,21	5	17	70	331.893,74	548,37	11.081,86
2	France	68	1955	24	28,75	4	7	26	67.499,34	1.007,42	28.963,25
3	Italy	68	1586	21	23,32	3	3	27	59.066,22	1.151,25	26.851,22
4	Spain	68	2019	19	29,69	4	8	18	47.326,69	1.436,82	42.660,92
5	Brazil	65	1087	17	16,72	2	2	22	51.744,88	1.256,16	21.006,91
6	England	63	1046	18	16,60	1	5	19	55.997,20	1.125,06	18.679,51
7	Australia	43	905	15	21,05	3	3	17	25.739,26	1.670,60	35.160,30
8	Germany	32	308	11	9,63	0	0	14	83.129,29	384,94	3.705,07
9	China	31	324	11	10,45	0	1	11	1.412.360,00	21,95	229,40
10	Poland	28	665	10	23,75	0	2	7	5.122,60	5.465,97	129.816,89
11	South Korea	28	259	8	9,25	0	1	6	213.993,44	130,85	1.210,32
12	New Zealand	25	857	16	34,28	1	4	12	5.122,60	4.880,33	167.297,86
13	Canada	24	250	10	10,42	0	1	9	38.246,11	627,51	6.536,61
14	Norway	23	875	13	38,04	2	2	11	276.361,79	83,22	3.166,14
15	Japan	22	207	9	9,41	0	0	8	125.681,59	175,05	1.647,02
16	Belgium	20	882	14	44,10	2	1	11	11.587,88	1.725,94	76.114,01
17	Denmark	17	443	10	26,06	1	2	8	5.856,73	2.902,64	75.639,48
18	India	17	83	5	4,88	0	0	3	1.393.409,03	12,20	59,57
19	Portugal	13	317	7	24,38	1	1	4	10.299,42	1.262,21	30.778,43
20	Netherlands	12	169	6	14,08	0	1	3	17.533,40	684,41	9.638,75
21	Scotland	11	116	7	10,55	0	0	4	5.454,24	2.016,78	21.267,86
22	Turkey	11	200	5	18,18	1	0	3	111.046,91	99,06	1.801,04
23	Uruguay	11	425	9	38,64	1	2	6	3.485,12	3.156,28	121.947,02
24	Mexico	10	89	5	8,90	0	1	1	10.664,57	937,68	8.345,39
25	Sweden	10	215	7	21,50	0	1	6	33.359,42	299,77	6.444,96

diverse perspectives within the academic community regarding the importance and impact of this research area. Overall, these rankings provide a comprehensive perspective on the significance of these institutions and their contributions to the field of ethics in trading.

3.1.4. The most productive and influential countries

Continuing our research, we now shift our focus to the examination of the top 25 countries that have wielded significant influence in the field of ethics in trading, as evidenced by the substantial number of papers they have contributed. It is worth noting that while these countries have made noteworthy contributions in terms of article production, there are approximately 125 other countries that have also made commendable efforts to advance research in this domain, both within their own borders and on a global scale. For our analysis, we consider the country of origin of the authors as the country of production.

To conduct this analysis, we have utilized a variety of indicators, like those presented in Table 3, and have also incorporated new metrics. These metrics encompass the total population of each country, obtained from data sourced from the World Bank Group, as well as the ratios of Total Papers to Population (TP/POP) and Total Citations to Population (TC/POP). By employing these additional metrics, we aim to gain insights into the research output and impact relative to the population size of each country.

Table 4, Table 5, and Fig. 3 offer valuable insights into the diverse landscape of countries engaged in research and scholarly publications about ethics in trading. These comprehensive analyses encompass a wide range of nations, including both well-established economies such as Norway and Germany, as well as emerging economies like Uruguay and Brazil. By including a diverse set of countries, this research highlights the global nature of the study of ethics in trading and demonstrates the broad geographical distribution of contributions to this field.

The United States stands out as the leading country in the study of ethics in trading, with a significant contribution to the field. It has produced a remarkable total of 182 papers, which have garnered 3678 citations, indicating the impact and influence of its research. Additionally, the country has achieved an impressive H-index of 33, further reinforcing its position as a prominent contributor in this area of study.

The United States' prominent contribution to the extensive body of literature on ethics in trading can be attributed to several factors. Firstly, the country's economic significance on the global stage plays a crucial role. As one of the largest economies in the world, the United States engages in extensive trade activities, necessitating in-depth research and analysis of ethical implications. The complex nature and scale of its trading operations create a demand for comprehensive studies in order to understand and address ethical challenges. Secondly, the United States benefits from a robust regulatory framework that governs trade and financial markets. Regulatory bodies are responsible for overseeing trading practices and enforcing ethical standards, ensuring fair and transparent transactions. This regulatory environment creates a fertile ground for scholarly exploration and discussion on ethics in trading, as researchers can examine the effectiveness of regulations and propose improvements.

The combination of its economic significance, robust regulatory framework, and prestigious academic institutions positions the country in a prominent role for generating valuable insights and knowledge regarding the ethical considerations intrinsic to trading practices.

Spain's position as the fourth most influential country in terms of the number of articles and citations reflects its active participation in international trade as a member of the European Union. Given its significant commercial ties and cross-border transactions, Spain recognizes the critical importance of ethical dimensions in trading. This awareness drives the country's researchers and scholars to contribute extensively to the understanding and exploration of ethics in trading, thereby enriching the global discourse on this subject.

In terms of publication efficiency and citation impact, Belgium stands out with 20 papers and a high citation ratio of 44.10 citations per article. This indicates a significant level of impact and suggests that the research conducted in Belgium on ethics in business and trading practices has garnered attention and recognition within the scholarly community. Similarly, Uruguay demonstrates a notable citation ratio of 38.64 citations per article, despite having a smaller total number of 11 articles. This achievement could be attributed to Uruguay's strong academic tradition, commitment to research and education, and the unique perspectives its academic articles offer due to the country's distinct cultural, societal, and economic context. These factors contribute to innovative insights and ideas, making Uruguay's contributions valuable to the field and resonating with the international scholarly community.

Table 5 offers a comprehensive comparative analysis of continents in terms of their contributions to the field of ethics in trading. Europe emerges as the continent with the highest production of articles, totaling 1723, and boasting an impressive H-index of 84. This achievement can be attributed to Europe's rich academic history, renowned universities, and well-established research facilities. Europe has a long tradition of engaging in philosophical, ethical, and economic debates, which has laid a strong foundation for research in this field. Furthermore, funding support from organizations like the European Research Council (ERC) has facilitated

Table 5
Publications classified by Continents.

Rank	Supraregions	Tp	TC	H	TC/TP	Population	TP/POP	TC/POP
1	Europe	1723	37409	84	21,71	3.699.168,19	465,78	10.112,81
2	North America	939	22976	71	24,47	380.804,42	2.465,83	60.335,43
3	Asia	399	5578	36	13,98	1.431.604,96	278,71	3.896,33
4	Oceania	253	4952	36	19,57	368.836,58	685,94	13.426,00
5	Africa	120	1740	21	14,50	25.739,26	4.662,14	67.601,01
6	Latin America	95	1061	18	11,17	303.725,03	312,78	3.493,29

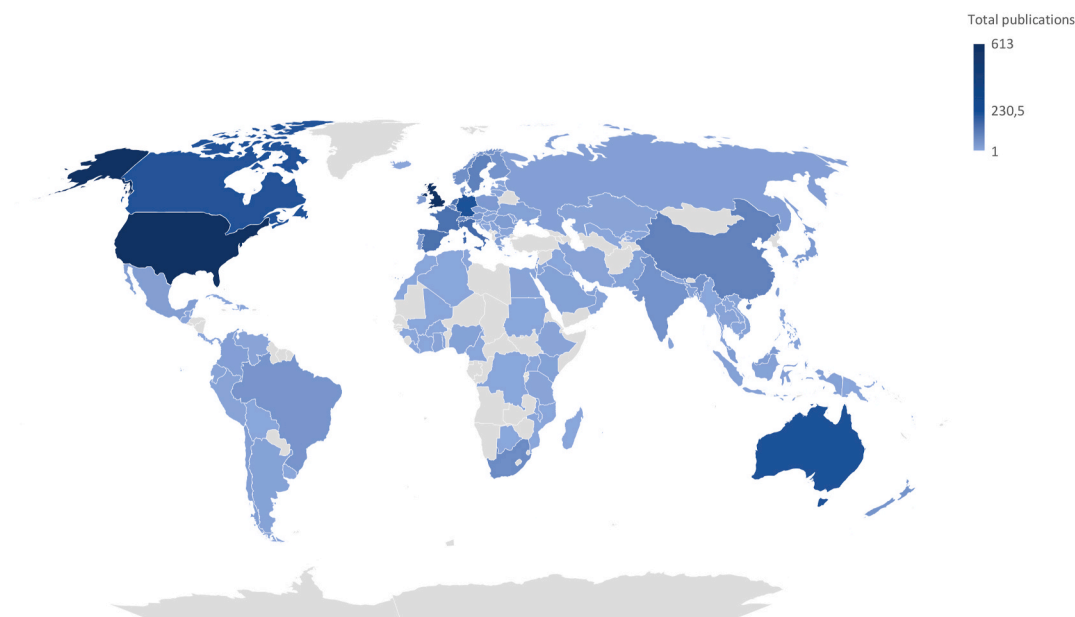


Fig. 3. World Map of Total Production by Countries

Source: Own elaboration employing Australian Bureau of Statistics, GeoNames, Geospatial Data Edit, Microsoft, Navinfo, OpenStreetMap.

research initiatives and encouraged scholarly endeavors. Europe actively participates in collaborative networks, both within the continent and beyond, which further enhances its research output and promotes knowledge exchange in the field of ethics in trading.

Following Europe, North America takes the second position in terms of article production with a total of 939 published articles and an H-index of 71. North America's high production rate in this field can be attributed to several factors that it shares with Europe, as well as some unique elements. Similar to Europe, North America benefits from a strong academic tradition, prestigious universities, and well-established research facilities. Additionally, North America's significant influence in various industries, particularly in finance and corporate sectors, contributes to its substantial productivity in the field of ethics in trading. The region's robust system of academic journals and publishing houses plays a crucial role in disseminating research findings and fostering scholarly discourse. These factors collectively contribute to North America's noteworthy contributions and position in the field of ethics in trading.

Asia, Oceania, Africa, and Latin America follow Europe and North America in the ranking of article production in the field of ethics in trading. Among these regions, Africa stands out as the most prominent, particularly in terms of the proportion of articles and citations per number of inhabitants. Africa's notable contribution to the field reflects its growing academic and research landscape, as well as its increasing engagement in global trade and commerce.

Nevertheless, the multinational and multifaced nature of trade and business calls for contributions from scholars all over the world in order to adequately address trading ethics.

3.2. Science mapping

Science mapping is a widely used and highly valuable method in bibliometric analysis, particularly in the study of ethics in trading. This approach involves the visualization and analysis of scientific literature to uncover relationships, patterns, and trends within the field. By utilizing graphical representations, science mapping allows us to understand the interconnections among different contributors in terms of their scientific publications. This method provides a structured, dynamic, and visually-driven framework, enhancing our analytical capabilities and offering valuable insights into the complex research domain of ethics in trading (Vizuet-Luciano et al., 2023).

Now, we will explore various graphical representations that illustrate the connections between the different aspects analyzed earlier, using a combination of tables and figures. These bibliometric mappings provide insights into the relationships between authors, primary academic journals, countries with notable publication rates, and the most frequently used keywords, which represent the key topics within the domain of ethics in trading. These visual representations offer a comprehensive overview of the interconnectedness and trends within the research field, allowing for a deeper understanding of the subject matter (Donthu et al., 2021). The VOS viewer has been utilized to create the following graphs, as mentioned in the methodology. This tool employs various techniques to analyze the diverse data, including analysis by citations, co-citations, co-occurrences, and bibliographic coupling. These techniques enable the identification of connections, patterns, and relationships within the research literature, providing valuable insights into the structure and dynamics of the field of ethics in trading.

The first two analyses, citations and co-citations, provide insights into the relationships among different articles within the field of ethics in trading. Citations analysis examines the duality of citations within the same article, where each citation refers to a different

journal or source. It analyzes the connections between the cited articles themselves, rather than the article that contains the citations. This analysis helps us understand how articles reference and relate to each other, revealing patterns and connections within the literature. Co-citation analysis, on the other hand, visualizes the most frequently cited articles and the connections between them. It identifies articles that are frequently cited together by other publications, highlighting the influential works and their interconnections. This analysis enables us to identify the central themes, influential authors, and significant research directions in the field of ethics in trading. Additionally, there is the bibliographic coupling analysis, which examines the instances where two papers or authors reference the same third-party source. This analysis helps us identify common sources that are influential in the field and provides insights into the intellectual connections between different works. Finally, we have the co-occurrence map, which provides insights into the interrelationships among keywords used in the field of ethics in trading. This analysis examines how often keywords appear together within sentences and texts, allowing us to identify the connections and associations between these words. By visualizing the co-occurrence patterns, we can determine which keywords are most frequently used in conjunction with each other and gain an understanding of the main themes and topics within the field.

Fig. 4 presents a visual representation of co-citations among authors who have been cited in the field of ethics. To construct this graph, a criterion was applied, requiring authors to have a minimum of 20 citations. Subsequently, the 100 most influential authors were selected for analysis. The graph provides insights into the prominent authors in the field and their interconnections. By examining the graph, we can identify three distinct groups represented by different colors: red, blue, and green. These colors signify clusters of authors who share closer relationships within their respective groups. The proximity of the dots and color blocks illustrates the strength of the relationships between authors. The closer the dots and color blocks are, the stronger the relationship between the corresponding authors. Analyzing the graph allows us to determine the most renowned authors in the field of investigation and observe how they are interconnected. It provides a visual representation of the relationships and collaborations among these influential authors.

Upon analyzing the three distinct blocks in the co-citations of authors, notable authors emerge based on their high citation values. In the red block, primarily comprising authors from the United States, notable figures include Gary Gereffi, a specialist in public policy within sociology and global value chains at the University of Sandford; Milton Friedman, whose influential ideas on economic policy liberalization originate from the University of Chicago; and Sabina Barrientos, an Argentinian author associated with the University of Manchester, who has made significant contributions in social protection and poverty reduction. These authors, along with others in the red block, exhibit collaboration with the blue block, which features authors not only from the United States but also from other nationalities, such as Marco Micheletti, an Italian academic from the University of Milan, and Laura T. Raynolds, an expert in sociology and sustainable food systems affiliated with Colorado State University. The interconnectedness between these authors reflects the contributions and shared interests within their respective research fields, leading to co-citations among them.

In the green block, notable authors from both the United States and Europe can be found. One significant author is Daniel Shaw, an academic affiliated with the University of Sussex, specializing in economics with a focus on industrial economics and public policy, particularly in areas such as regulation, competition, and innovation. Another noteworthy author is Patrick De Pelsmacker from Belgium, associated with the University of Antwerp, who possesses expertise in marketing, consumer behavior, and decision-making. Icek Ajzen from the University of Massachusetts Amherst is also prominent in the field of psychology, specifically in attitude formation and behavior prediction. This block demonstrates a stronger emphasis on behavioral factors and social psychology research, extending beyond traditional economic perspectives. Such insights are crucial when examining ethical issues in sales and purchasing domains.

Fig. 5 depicts a bibliographic coupling of institutions engaged in the field of ethics within trade. The graph includes institutions that have published at least 10 collaborative articles, indicating their significant involvement in joint research efforts. The selection process resulted in the inclusion of the top 200 notable institutions in the graph, showcasing their interconnections and collaborations in scholarly publications. By analyzing the representation of institutions in Fig. 5, we can explore the associations and connections between them. This figure provides insights into the collaborative relationships and research networks among these institutions in the

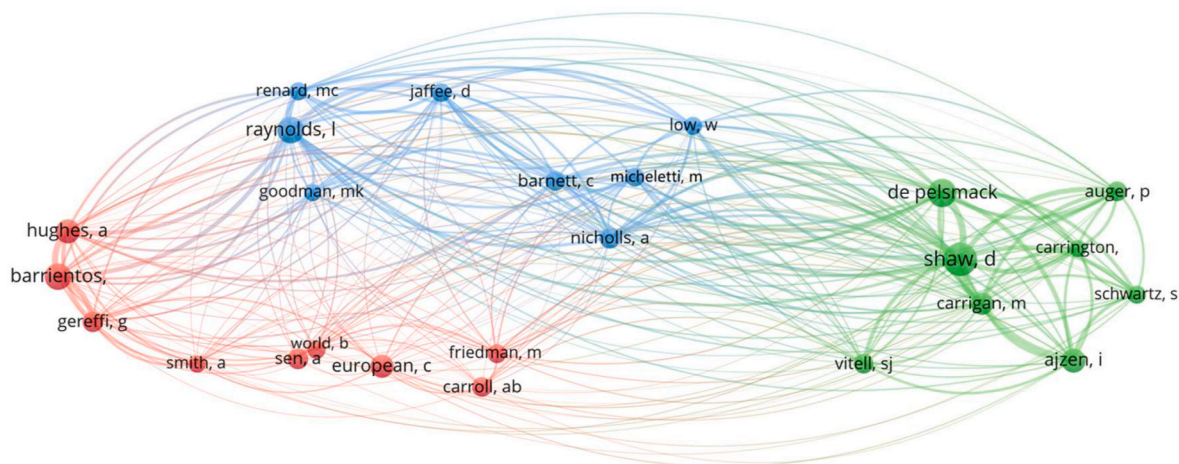


Fig. 4. Co-citations of authors cited on Ethics.

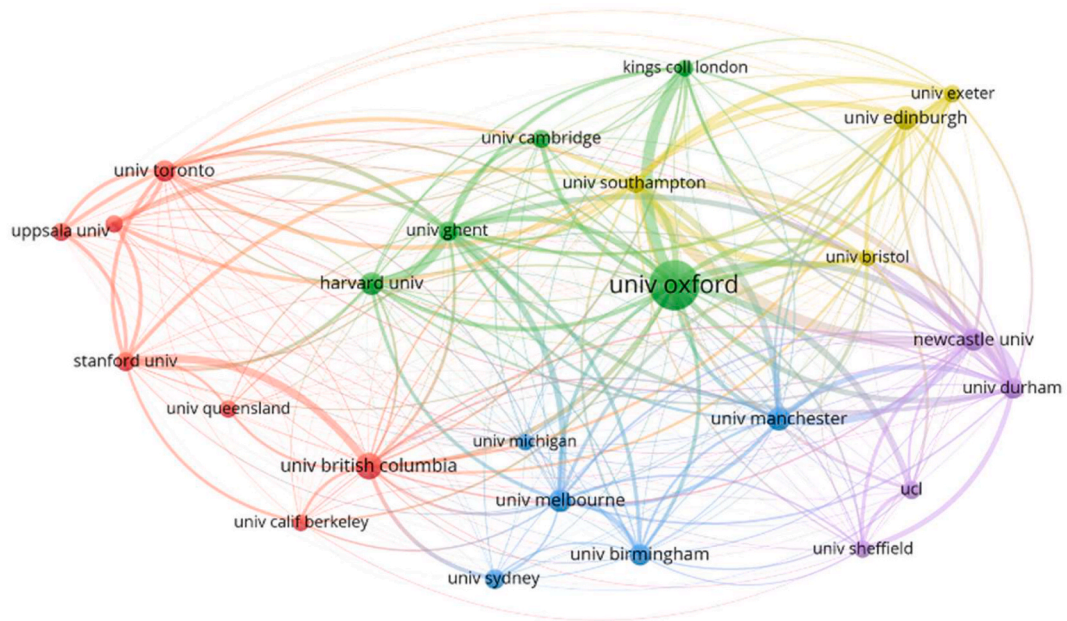


Fig. 5. Bibliographic coupling of institutions publishing.

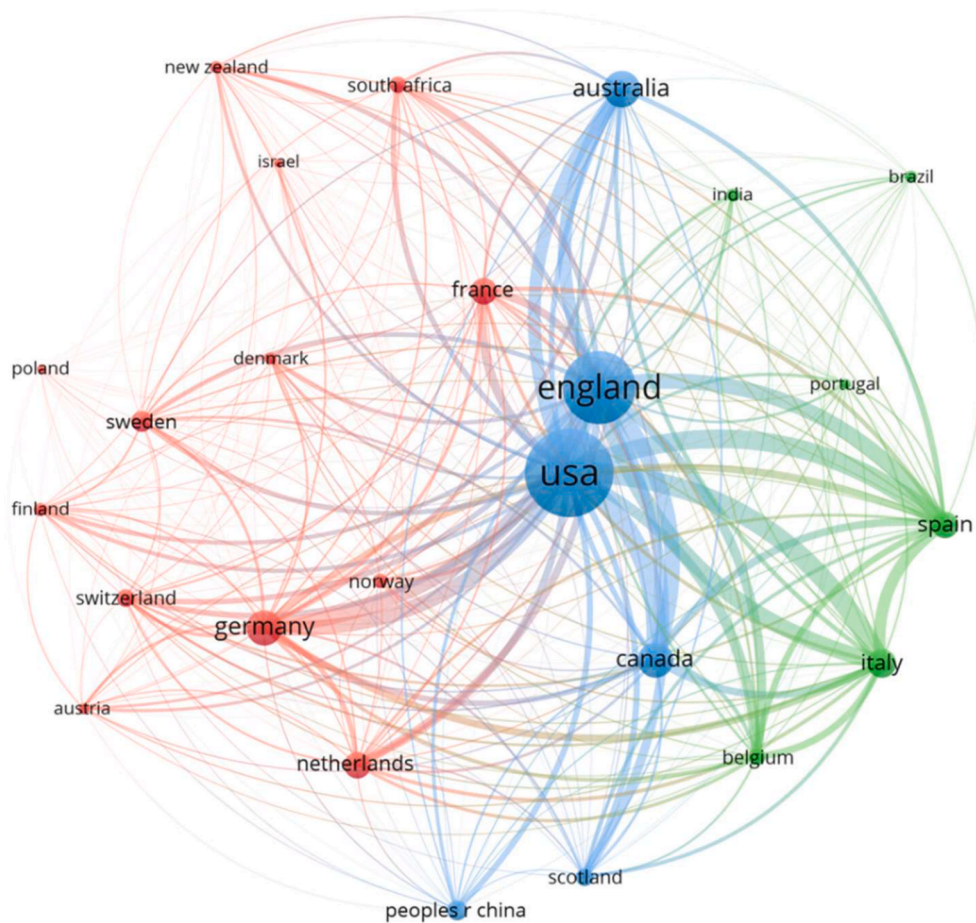


Fig. 6. Bibliographic coupling of countries publishing.

field of ethics in trading. Moreover, by linking Fig. 5 with the previous figure (Fig. 4) that focuses on authors and the subsequent figure (Fig. 6) that examines countries, we can identify potential intersections and relationships between authors, institutions, and countries. This comprehensive analysis allows us to gain a more holistic understanding of the global landscape of research in ethics within trade and how various entities are interconnected within this domain.

Upon examining Fig. 5, the University of Oxford stands out as the institution with the highest influence and collaboration with other institutions worldwide in the field of ethics in trading. It is represented by the most extensive dot and wider lines of connections. Additionally, we can observe collaborations between institutions based on various factors. Geographically, there is a clear correlation as institutions from the United Kingdom are grouped in the yellow and purple blocks, while the blue block includes Australian universities such as the University of Melbourne and the University of Sydney, all of which share collaborations. On the other side of the graph, the red block comprises mainly North American universities from the United States and Canada, with the addition of the University of Queensland from Australia and Uppsala University from Sweden. Although these institutions show less collaboration with other blocks, they have internal collaborations within their respective block, such as Stanford University's strong collaboration with the University of British Columbia, as well as collaborations primarily with the green block. The green block, situated in the middle of the graph and featuring the University of Oxford, includes universities from the United Kingdom (yellow, purple, and blue blocks) and is also connected to the red block through Harvard University from the United States and the University of Ghent from Belgium. Thus, this analysis reveals a clear correlation not only in terms of geography but also in terms of cultural dimensions. The similarities shared by these institutions, such as language, policy frameworks, and societal behaviors, facilitate collaborations in research involving ethics. Since ethics is subjective to social and political norms prevailing in each country, the collaboration between international institutions is closely related to the cultural context of their respective countries.

Fig. 6 presents a bibliographic coupling of countries publishing in the field of ethics in trading. The chart highlights the 25 most representative countries in terms of correlation. The connections between institutions, as we have observed, are primarily influenced by geographic and cultural factors, and these connections are also evident in this graph. England, the United States, Australia, Canada, and to a lesser extent, Scotland, emerge as the countries with the highest academic connections in this area of study. The relationship between Fig. 5 (institutions) and Fig. 6 (countries) becomes apparent, shedding light on the rationale behind the collaborative efforts of the previously mentioned institutions. These institutions belong to the countries that are most actively involved in this research domain and exhibit the highest levels of cooperation among themselves. The interplay between Figs. 5 and 6 contributes to our understanding of the collaborative dynamics among institutions, considering that they originate from countries with substantial involvement in the field of ethics in trading.

Culture indeed plays a significant role in the field of study, as reflected in the clustering of culturally similar countries within the blocks. In the center, within the blue block, we find Anglo-Saxon countries that share not only the English language but also common values and ways of life. Moving to the right side of the figure, the green group consists primarily of countries with Latin languages such as Spain, Portugal, and Italy, with some connections to France, another Latin language country located in the red block. Intra-country collaborations between England, the U.S., Spain, and Italy are particularly prominent, as indicated by the thickness of the connection lines. On the left side, within the red block, we find countries primarily from northern Europe, along with countries from the southernmost parts of the world, such as South Africa and New Zealand, which share English as their main language. These countries exhibit similar values and lifestyles, and, together with the U.S. and Canada, belong to dignity cultures characterized by independence, trust, and robust legal systems. Consequently, we observe significant collaborations between countries such as Germany, Norway, and the Netherlands with the U.S. and England, facilitated by their cultural affinities and shared characteristics.

Fig. 7 presents a graph illustrating the co-citation of journals, providing insights into the influence and relevance of different journals in the field. By analyzing this graph, we can identify the journals that serve as significant sources of information for others. This mapping allows us to understand which articles and publications are considered highly relevant in the field based on their association with influential journals. To create Fig. 7 of the co-citation mapping of journals, a co-citation threshold was set, where only journals with a minimum of 350 co-citations will appear.

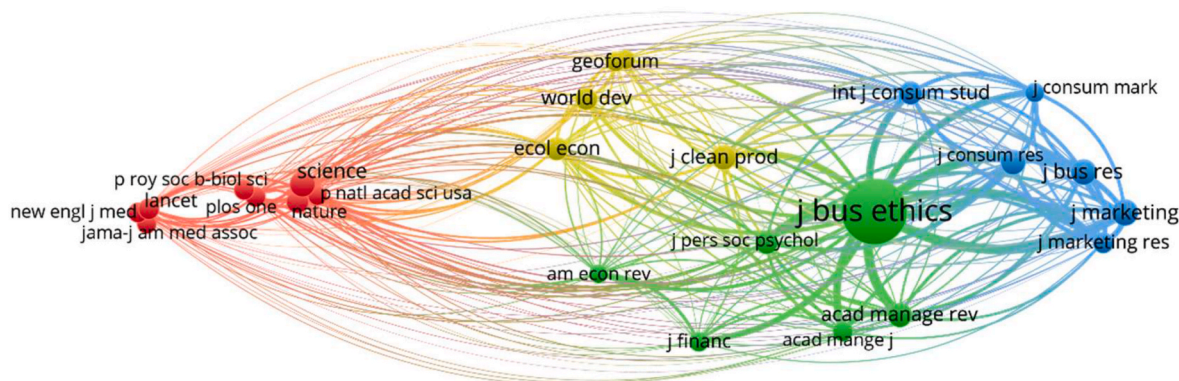


Fig. 7. Co-citation of journals.

Fig. 7 showcases the co-citation mapping of journals, revealing four distinct groups based on their connections. The larger dots represent journals that have published a significant number of articles, while the lines indicate the citations between journals. The Journal of Business Ethics emerges as the most notable journal in Fig. 7, primarily citing other journals within its own block (green) and the blue block. The green block represents journals that intersect business, management, ethics, and psychology. The red block consists of scientific journals such as The Lancet, PLoS ONE, and Science. The yellow block comprises journals like Geoforum, World Development, Ecological Economics, and the Journal of Cleaner Production, which focus on innovative approaches to sustainability in various fields. Lastly, the blue block includes journals centered around consumption patterns, consumer behavior, and marketing.

By analyzing these groups, we can gain insights into the prominent themes and disciplines within the field of study. Notable citations include journals such as *Personality and Social Psychology*, *Journal of Marketing*, *Academy of Management Review*, and *Journal of Business Research*, among others. However, the *Journal of Business Ethics* also shows some connections to journals in the red and yellow blocks, although to a lesser extent. This suggests that while the journal's focus is primarily within its own field and related areas, it also draws insights and influences from scientific and sustainability-focused journals.

Indeed, the wide variety of journals in the domains of economics, finance, psychology, and science reflects the importance of ethical concerns in trading. The fact that ethical considerations are published in both scientific and theoretical journals highlights the interdisciplinary nature of ethical issues in the field of trading. It indicates that ethical concerns are not limited to a specific discipline but are recognized and explored from various perspectives. This interdisciplinary approach acknowledges the significance of ethics in shaping and influencing trading practices, policies, and decision-making processes across different domains.

Fig. 8 presents a co-occurrence map of keywords, providing insights into the most frequently mentioned words and the interconnectedness of topics in the domain of ethics in trading. The map is constructed based on the analysis of the 300 most frequently repeated words in the articles, with a minimum occurrence threshold of 20, ensuring the validity and significance of the identified keywords. By examining this map, we can gain a better understanding of the prominent topics discussed in the field and the relationships between these topics.

Analyzing the map, it becomes evident that the keywords are divided into four distinct blocks, signifying the four main topic areas that have been explored by academics in the field of ethics in trading over the years. These blocks represent the prominent themes and subjects that have garnered significant attention and research within the domain.

Prior to delving into the analysis of the four blocks, it is worth noting the significant presence of three principal subjects: Ethics, Fair

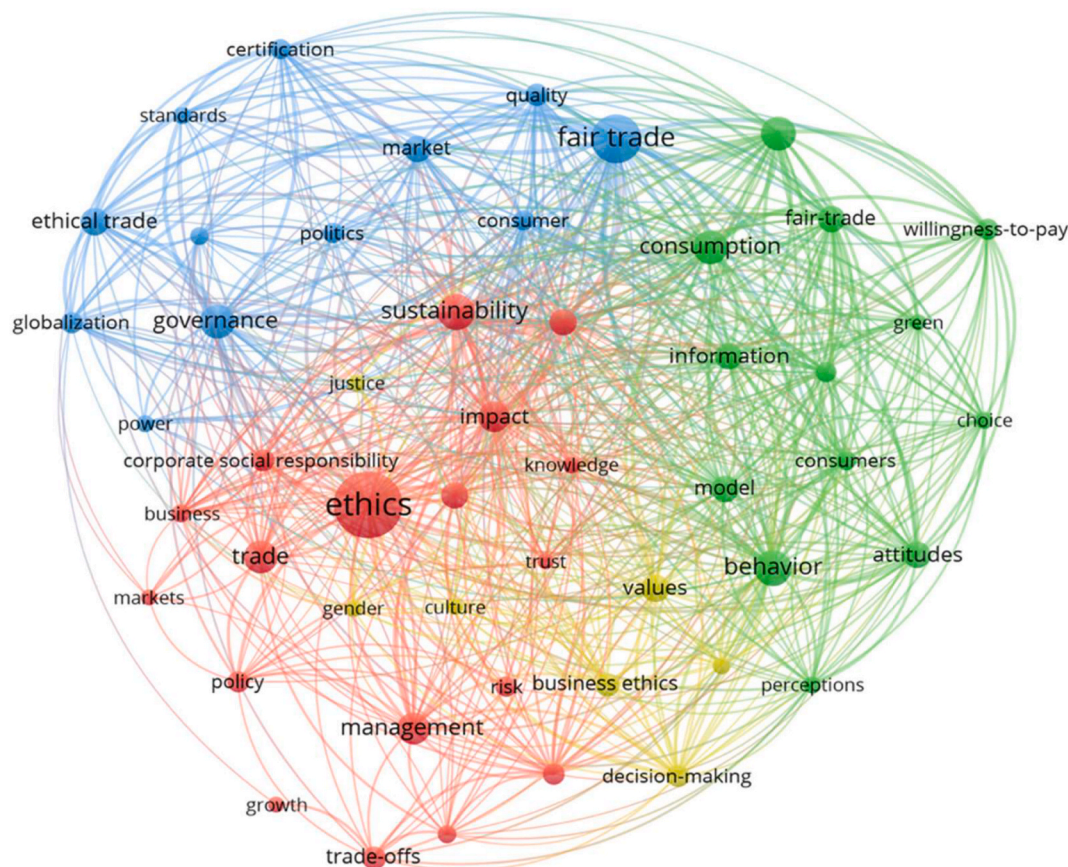


Fig. 8. Co-occurrence of keywords.

Trade, and Sustainability, distinguished visually by the size of their respective dots. For example, the articles by [Shefrin and Statman \(1993\)](#) and [Bosch-Badia et al. \(2018\)](#) stand out. Shefrin and Statman explore the ethical dimensions within financial markets, particularly focusing on how regulations like those against insider trading reflect a balance between market efficiency and fairness. This study underscores the continuous tug-of-war between the pursuit of economic efficiency and the maintenance of fair-trading practices, illuminating how these dynamics shape financial regulations. On the other hand, Bosch-Badia et al. delve into how financial markets can incorporate sustainability goals into their operational frameworks, emphasizing the role of ethical considerations in price determination. They argue that aligning market activities with sustainability objectives requires a fundamental integration of ethical practices into all levels of decision-making, from corporate governance to investor actions. It comes as no surprise that these words form the bedrock of the field of investigation, as they encapsulate the fundamental principles underlying contemporary trade practices. In the current era, the pursuit of fair trade and sustainability extends beyond mere economic and environmental considerations, encompassing essential aspects such as human rights, global income distribution, poverty and hunger alleviation, and gender equality. Ethical considerations serve as the critical catalyst to address these multifaceted challenges and promote a more equitable and sustainable trade landscape.

Upon closer examination of the distinct blocks, we begin with the blue block, centered around the pivotal topic of Fair Trade. This block encompasses related subjects such as Governance, Market, Politics, and Globalization. For instance, [Buckley \(2012\)](#) provides a comprehensive analysis of the failures in governance that led to the 2008 financial crisis and discusses the ongoing reforms essential for future stability in global financial markets. Additionally, [Dogan et al. \(2020\)](#) examines the empirical relationship between these factors, emphasizing the role of effective governance in leveraging the positive impacts of globalization on economic growth. These topics underscore the increasing need for enhanced market regulation and the imperative for international political integration in response to the expanding realm of global trade facilitated by globalization. Moving on to the red group, we encounter the focal points of Ethics and Sustainability. Within this block, we find keywords such as Impact, Management, Corporate and Social Responsibility, Trade-offs, and Policy. In this block stands out papers like [Varenova et al. \(2013\)](#) and [Flammer \(2015\)](#). For the case of [Varenova et al. \(2013\)](#) and [Flammer \(2015\)](#), reveals that FTSE 100 companies are more likely to have integrated CSR into their core business strategies compared to other FTSE All-Share companies. Moreover, [Flammer \(2015\)](#) explores how CSR activities influence stock prices, particularly in the aftermath of the financial crisis, highlighting that CSR can act as a risk management tool, helping firms to weather economic downturns more effectively. This emphasizes the significance of addressing the ethical dimensions of corporate resource management and the impact it has on various facets of sustainability. It highlights the need for well-defined policies and, at times, necessitates making trade-offs to achieve sustainable outcomes while upholding social responsibility.

Within the green block, the key topics identified are Consumption and Behavior. Associated keywords in this block include Attitudes, Information, Choice, Model, and Perceptions. [Cheema and Soman \(2006\)](#) explore how psychological factors such as mental accounting impact consumer spending and financial decisions, emphasizing the role of consumer psychology in financial markets. Additionally, [Keller and Siegrist \(2006\)](#) examine how financial literacy and money attitudes influence investment decisions and risk perception, highlighting the importance of financial education in shaping consumer behavior. This block primarily focuses on studying consumer behavior, exploring how individuals respond to and process information, examining their preferences and choices, and developing models that offer macroeconomic theoretical explanations for consumption equilibrium. It encompasses research that delves into understanding consumer attitudes and perceptions to provide insights into the dynamics of consumer decision-making processes.

In the yellow block, we find keywords that serve as a bridge between the ethics and sustainability block (in red) and the consumption behavior block (in green). These keywords include Business Ethics, Justice (closer to the blue group related to fair trade and politics), Culture, Gender, and Values. [Ghahroodri et al. \(2019\)](#) study how integrating ethical values into corporate strategies can address issues of fairness and justice, emphasizing the role of cultural and gender perspectives in fostering equitable business practices. Additionally, [Buck et al. \(2010\)](#) examine the impact of cultural and gender differences on ethical behavior in financial trading, suggesting strategies for creating a more inclusive and ethical business environment. While these keywords may appear less prominent, they play a crucial role in connecting the different important topics and highlighting the variations in ethics and consumer behavior across different countries. They shed light on the cultural influences, gender dynamics, and underlying values that shape ethical considerations and consumer practices in diverse socio-cultural contexts. These keywords serve as connectors, highlighting the interplay between ethical frameworks, social justice, cultural norms, and consumer behaviors.

4. Conclusions

Ethics plays a vital role in the field of trading and has garnered significant attention in recent years. The increasing number of publications and citations dedicated to ethics in trading reflects its importance and the interest it holds for prestigious journals. Conducting a bibliometric analysis using performance analysis and scientific mapping is crucial in understanding the vast literature and diverse research avenues in this subject. Such analysis enables us to identify influential authors and relevant journals within this domain. This study, based on data from the Web of Science Core Collection database, confirms the immense potential and significant interest that ethics in trading should generate among top-tier journals.

The results of our analysis highlight a notable upward trend in the production of articles focused on ethics in trading, indicating its growing acceptance and relevance within the academic community, as evidenced by the substantial number of citations received. This trend underscores the increasing recognition of the importance of ethical standards in trading practices. These articles originate from a diverse range of over 100 countries, illustrating the global nature of research in this field. The issue of maintaining ethical standards in trading holds significant importance worldwide, impacting countries and cities across the globe. Notably, countries with large

populations and a prominent presence in speculative activities such as the United States, the United Kingdom, Australia, and Canada have made substantial contributions to the existing body of literature. These countries lead in both the quantity and impact of publications, reflecting their critical role in shaping the discourse on trading ethics. Additionally, countries like Germany, Spain, and Italy have also emerged as contributors of high-value articles, indicating a widespread academic interest in ethical trading practices.

By utilizing the VOSViewer program, we have conducted a scientific mapping that allows us to identify influential authors who have made noteworthy contributions to this field of study. Esteemed academics such as Alexandra Hughes and David Beck, renowned for their extensive expertise in the subject matter, stand out among the prominent figures in the field. The identification of these key contributors highlights the collaborative nature of research in trading ethics and the importance of cross-institutional efforts in advancing the field. Furthermore, we have identified key journals that serve as valuable sources of information in this domain, including the *Journal of Business Ethics*, *Personality and Social Psychology*, *Journal of Marketing*, *Academy of Management Review*, and *Journal of Business Research*, among others. The prominence of these journals underscores their role in disseminating crucial research findings and fostering scholarly dialogue on ethical issues in trading. These findings provide a solid foundation for advancing new research avenues and enhancing our understanding of the intricacies surrounding ethics in trading.

When examining the institutions involved in the study of topics related to ethics in trading, we observe a notable presence of internationally renowned universities over the years. Institutions such as the University of Oxford, the University of Melbourne, the University of Sydney, and the University of Queensland have consistently contributed to the academic discourse on these subjects. These institutions have demonstrated a sustained commitment to exploring the ethical dimensions of trading, which is reflected in their prolific research output. However, in recent years, there has been an increasing emphasis on these research areas from Australian and European universities of significant repute, including Uppsala University, the University of British Columbia, and the University of Ghent. This shift highlights the expanding geographical scope of research on trading ethics and the growing involvement of diverse academic institutions in this critical area of study.

Short selling in high-frequency trading can increase market volatility and disproportionately benefit large institutions, raising ethical concerns about fairness and financial stability. Meanwhile, ethical management in commodity trading demands sustainable and fair practices to protect the environment and labor rights. The growing focus on corporate social responsibility drives companies to adopt higher ethical standards and consider the impact of their actions on society and the environment. The most significant contribution of this article lies in its proposal and endorsement of future research directions in this field. Several areas of study have been identified, including corporate social responsibility, fair trade, sustainability, consumer behavior, and information analysis. These areas represent key aspects of ethical trading that warrant further investigation to develop comprehensive frameworks and best practices. Moreover, there is a strong incentive to investigate new strategies concerning willingness-to-pay, quality assurance, and certifications. Addressing these topics can provide valuable insights into consumer preferences and the mechanisms through which ethical standards can be effectively implemented and monitored in trading practices.

Additionally, the article suggests exploring topics such as politics, consumer attitudes, and governance in future research endeavors. These dimensions are crucial for understanding the broader societal and regulatory context within which trading ethics operate. By examining the interplay between ethical practices and political and regulatory frameworks, researchers can develop more robust and contextually relevant ethical guidelines for the trading industry.

In the ever-evolving landscape of financial markets, there is growing concern and increasing research focus on the emergence of new forms of trading, particularly high-frequency trading (HFT). HFT involves the use of powerful computer algorithms to execute large numbers of trades at extremely high speeds, often within microseconds. While HFT has contributed to market liquidity and efficiency, it has also raised ethical concerns and sparked debates about its potential impact on market stability, fairness, and transparency. Researchers are keenly interested in understanding the ethical implications of HFT and exploring ways to integrate ethical practices into this rapidly evolving field. One key area of investigation is the potential for market manipulation and unfair advantages that may arise from the speed and complexity of HFT algorithms. Studies are being conducted to assess the impact of HFT on market integrity and to propose regulatory measures that can ensure a level playing field for all participants.

Moreover, the combination of ethical practices with new forms of trading is a promising avenue of research. Scholars are exploring how ethical considerations can be embedded into HFT strategies, such as the development of algorithms that prioritize responsible trading practices and consider the long-term societal implications. This includes considerations of market stability, risk management, and the avoidance of excessive speculation or predatory behaviors. By addressing these challenges, researchers can contribute to the development of a more ethical and sustainable trading environment that balances technological innovation with the principles of fairness and transparency.

In conclusion, the study highlights the critical importance of ethics in trading and provides a comprehensive overview of the current state of research in this field. The findings underscore the need for continued exploration and integration of ethical considerations in trading practices to promote a more equitable and sustainable financial market. This research not only advances our understanding of the ethical dimensions of trading but also paves the way for future investigations that can further enrich the field and contribute to the development of ethical standards that guide trading practices globally.

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Declaration of Interest statement

Declaration of Interest: none.

CRediT authorship contribution statement

Miguel Guillén-Pujadas: Conceptualization, Investigation, Software, Writing – original draft. **David Alaminos:** Software, Validation, Formal analysis, Visualization. **Emili Vizuete-Luciano:** Methodology, Data curation, Writing – original draft. **Angela M. Callejón-Gil:** Methodology, Formal analysis, Resources. **José María Merigó-Lindahl:** Supervision, Project administration, Writing – review & editing.

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Appendices

Table 1A

Top 50 Most cited articles on Ethics in Trading.

Rank	Title	Author/s	Year	TC	C/Y
1	How business schools lost their way	Bennis, W. G.; O'Toole, J.	2005	1089	45,56
2	Stakeholder Theory: The State of the Art	Parmar, B. L.; Freeman, R. E.; Harrison, J. S.; Wicks, A.C.; Purnell, L.; de Colle, S.	2010	985	24,29
3	Sustainable Consumption: Green Consumer Behaviour when Purchasing Products	Young, W.; Hwang, K.; McDonald, S.; Oates, C. J.	2010	746	10,63
4	Do consumers care about ethics? Willingness to pay for fair-trade coffee	De Pelsmacker, P.; Driesen, L.; Rayp, G.	2005	675	12,00
5	Why Ethical Consumers Don't Walk Their Talk: Towards a Framework for Understanding the Gap Between the Ethical Purchase Intentions and Actual Buying Behaviour of Ethically Minded Consumers	Carrington, Michal J.; Neville, B. A.; Whitwell, G. J.	2010	606	8,92
6	Ethical Decision-Making - A Review Of The Empirical Literature	Ford, R.; Richardson, W.	1994	606	13,70
7	An Exploratory Study into the Factors Impeding Ethical Consumption	Bray, J.; Johns, N.; Kilburn, D.	2011	423	12,20
8	Consuming ethics: Articulating the subjects and spaces of ethical consumption	Barnett, C.; Cloke, P.; Clarke, N.; Malpass, A.	2005	390	7,06
9	Do fair trade and eco-labels in coffee wake up the consumer conscience?	Loureiro, M. L.; Lotade, J.	2005	332	13,22
10	Reading fair trade: political ecological imaginary and the moral economy of fair trade foods	Goodman, M. K.	2004	306	5,90
11	The Missing Link Between Corporate Social Responsibility and Consumer Trust: The Case of Fair Trade Products	Castaldo, S.; Perrini, F.; Misani, N.; Tencati, A.	2009	297	7,73
12	Global standards, global governance and the organization of global value chains	Nadvi, K.	2008	273	9,50
13	Recent advances in carbon emissions reduction: policies, technologies, monitoring, assessment and modeling	Huisingh, D.; Zhang, Z.; Moore, J. C.; Qiao, Q.; Li, Q.	2015	221	7,13
14	Regulating sustainability in the coffee sector: A comparative analysis of third-party environmental and social certification initiatives	Raynolds, L. T.; Murray, D.; Heller, A.	2007	209	18,83
15	Implementing shared decision-making: consider all the consequences	Elwyn, G.; Frosch, D. L.; Kobrin, S.	2016	184	13,88
16	Do Islamic stock indexes outperform conventional stock indexes? A stochastic dominance approach	Al-Khazali, O.; Lean, H. H.; Samet, A.	2014	167	8,54
17	The Brave New World of Carbon Trading	Spash, C. L.	2010	166	5,74
18	The conscious consumer: taking a flexible approach to ethical behaviour	Szmigin, I.; Carrigan, M.; McEachern, M. G.	2009	154	9,00
19	Leaders as moral role models: The case of John Gutfreund at Salomon Brothers	Sims, R. R.; Brinkman, J.	2002	146	8,50
20	Economic, social and political issues raised by the COVID-19 pandemic	Tisdell, C. A.	2020	144	3,60
21	Do ethical consumers care about price? A revealed preference analysis of fair trade coffee purchases	Arnot, C.; Boxall, P. C.; Cash, S. B.	2006	120	10,88
22	Carbon emission reduction: the impact on the financial and operational performance of international companies	Gallego-Alvarez, I.; Segura, L.; Martinez-Ferrero, J.	2015	119	5,44
23	The Influence Of Personality And Demographic-Variables On Ethical Decisions Related To Insider Trading	Terpstra, D. E.; Rozell, E. J.; Robinson, R. K.	1993	118	5,12
24	Morals, money, ethical investing and economic psychology	Lewis, A.; Mackenzie, C.	2000	106	14,33
25	The interstices of globalization: The example of fair coffee	Renard, M. C.	1999	105	7,82
26	Consumer Demand For Fair Trade: Evidence From A Multistore Field Experiment	Hainmueller, J.; Hiscox, M. J.; Sequeira, S.	2015	100	7,82
27	Ecologically unsustainable trade	Andersson, J. O.; Lindroth, M.	2001	100	4,10
28	Global production networks, ethical campaigning, and the embeddedness of responsible governance	Hughes, A.; Wrigley, N.; Buttle, M.	2008	96	3,95

(continued on next page)

Table 1A (continued)

Rank	Title	Author/s	Year	TC	C/Y
29	Carbon offsetting: sustaining consumption?	Lovell, H.; Bulkeley, H.; Liverman, D.	2009	95	9,63
30	Does Fair Trade Deliver on Its Core Value Proposition? Effects on Income, Educational Attainment, and Health in Three Countries	Arnould, E. J.; Plastina, A.; Ball, D.	2009	95	4,81
31	Fair trade: A cup at a time?	Levi, M.; Linton, A.	2003	95	6,25
32	What Are Financial Journalists For?	Tambini, D.	2010	94	9,00
33	French fair trade coffee buyers' purchasing motives: An exploratory study using means-end chains analysis	de Ferran, F.; Grunert, K. G.	2007	94	11,83
34	The Fair Trade'' Effect: Health Halos From Social Ethics Claims	Schuldt, J. P.; Muller, D.; Schwarz, N.	2012	93	5,46
35	The ideology of the ethical consumption gap	Carrington, M. J.; Zwick, D.; Neville, B.	2016	92	5,07
36	Investing in socially responsible companies is a must for public pension funds - Because there is no better alternative	Sethi, S. P.	2005	85	8,63
37	Shared decision making: trade-offs between narrower and broader conceptions	Cribb, A.; Entwistle, V. A.	2011	84	6,60
38	Ethical trade: a review of developments and issues	Blowfield, M.	1999	84	4,06
39	Has the medium (roast) become the message? The ethics of marketing fair trade in the mainstream	Low, W.; Davenport, E.	2005	80	6,40
40	Understanding Socially Responsible Investing: The Effect of Decision Frames and Trade-off Options	Glac, K.	2009	76	8,57
41	Where now for fair trade?	Doherty, B.; Davies, I. A.; Tranchell, S.	2013	73	4,62
42	Corporate purchasing practices in global production networks: A socially contested terrain	Barrientos, S.	2013	71	4,62
43	Fair Trade: Social regulation in global food markets	Raynolds, L. T.	2012	71	4,62
44	The environment as a commodity	Vatn, A.	2000	71	8,29
45	Who'S With Me? False Consensus, Brokerage, And Ethical Decision Making In Organizations	Flynn, F. J.; Wiltermuth, S. S.	2010	69	3,63
46	What Is a Fair Price? Ethics as Sensemaking	Reinecke, J.; Ansari, S.	2015	67	9,50
47	Circularity Brokers: Digital Platform Organizations and Waste Recovery in Food Supply Chains	Ciulli, F.; Kolk, A.; Boe-Lillegraven, S.	2020	66	7,13
48	Support for investor activism among UK ethical investors	Lewis, A.; Mackenzie, C.	2000	66	4,67
49	Fair trade and ethical trade: Are there moves towards convergence?	Smith, S.; Barrientos, S.	2005	64	9,17
50	Alternative negotiating conditions and the choice of negotiation tactics: A cross-cultural comparison	Volkema, R. J.; Fleury, M. T. L.	2002	61	7,86

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