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Consumer Risk in Investment Decision Making

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Abstract

Research on consumer risk in investment decision making has expanded rapidly as individuals and households have taken on greater responsibility for their own financial futures, from retirement savings to cryptocurrency and app-based investing. This study is a bibliometric review to trace the development of the field, identify the intellectual structure and emerging directions in this field. All documents were retrieved from Scopus using the following terms: consumer, investment and risk; the number of documents retrieved were 1656, published by 1009 sources, and filtered by time span (2008–2027), document type, language and source type. Data were analysed in R by using the packages Bibliometrix and Biblioshiny. The number of documents produced each year increased from 27 documents in 2008 to 214 in 2025, representing approximately 36% of the data for the last 3 years. With USA in first place, followed by China, U.K., India and Australia, and a wide distribution of sources including energy and sustainability journals, it's clear that the field is interdisciplinary. Thematic analysis shows a shift from risk tolerance, financial literacy and investor sentiment towards consumer protection, uncertainty and resilience, and more recently FinTech, artificial intelligence, ESG and sustainable development. The review identifies fragmentation across behavioural, portfolio, technology and regulatory streams and sets out an agenda for future research.

Keywords

Consumer risk; Investment decision making; Bibliometric analysis; Risk tolerance; Financial literacy; FinTech; Artificial intelligence; ESG

1. Introduction

1.1 Background of the study

Research related to consumer risk in investment decision making has grown nearly eight times in magnitude from 2008 to 2025. It is all about a very basic reality that individuals themselves bear the burden of being responsible for the security of their financial future. From retirement savings, stock investments, mutual funds to crypto and mobile applications, financial decision-making has shifted from the domain of professional advisors to individuals and households. Investment for retirement is among the biggest and most daunting decisions that consumers make in their life. The problem with risk is that it is experienced differently by different individuals. Research has shown that consumers possessing cryptocurrencies without financial literacy and risk-taking ability are financially vulnerable due to the volatility of this market, which lacks consumer protection measures. The understanding of the perception, judgment and reaction of individual towards risk is vital in this context. (D. G. Goldstein et al., 2008; Hayashi & Routh, 2025)

Consumer risk in investment decision making lies at the intersection of consumer behaviour, financial risk and investment decision making. In this literature, individuals are not only considered as investors making allocations but also as consumers perceiving and responding to different stimuli. A review of 264 peer reviewed articles between 2001 and April 2025 show that the antecedents to retail investor behaviour include psychological biases, socio-economic variables, and disruptions at the global level including technological advancement and coronavirus pandemic. As retail investors have the capacity to drive market trends collectively, this research considers this topic an opportunity and challenge at the same time. The reason is that if there is a better understanding of retail investors' behaviour, there will be a positive effect on financial products and services; however, poor decisions may lead to adverse effects on individuals and families in terms of their future financial security. (Aftab et al., 2025; Kumar & Ranjani, 2025)

As can be seen, the discussed topic relates to multiple disciplines rather than just one area. It is because the dataset used in the current study involves 1,009 sources from 2008 to 2027 that do not belong to one and the same field. Apart from the studies related to consumer finance, this field includes energy economics and operations research as well. Sustainability, Energy Economics, and Energy Policy are among the top three sources while the most popular journal in the domain of consumer finance is the International Journal of Bank Marketing.

1.2 Evolution and significance of the research area

The evolution of the topic has been clearly observable and predictable. From 2008 to 2018, the level of output remained relatively low and was concerned with the choice of individuals' retirement investments and their risk preferences. Then, from 2019 to 2021 and from 2022, the output became higher reaching its peak in 2025. In particular, the three final years of the period under consideration make almost 36 percent of all publications of the period between 2008 and 2025. It may be concluded that the documents in question are relatively recent – their average age does not exceed 5.72 years. (D. G. Goldstein et al., 2008; Yao et al., 2011)

COVID-19 has become one of the triggers of acceleration, as it influenced finance research in general. The research based on data from the large consumer sample showed a decrease in overall risk preference related to financial matters at the time when the number of COVID-19 cases increased in the USA. Also, comparing the behaviour of the Shariah and non-Shariah sector indices, we may conclude that crises have an impact on investment groups. In addition, they allowed the emergence of issues such as risk tolerance, uncertainty and resilience as central themes instead of contextual factors. Meanwhile, innovations in investment products expanded the scope of research. The relationship between social media usage and cryptocurrency investments was shown using the 2021 National Financial Capability Study, and a study on 19,015 urban households in China showed that higher financial literacy increases the proportion of risky assets held by households. (Heo et al., 2021; Kim & Fan, 2025)

1.3 Consumer behaviour and technological change

Technology has altered the sources of influence on consumers and how they invest. Crowdfunding became the first example of a way to turn customers into investors using services offered by intermediary platforms, signalling future shifts in the boundary between consumption and investment activities. Security and trust emerged as central issues for these processes. Research was conducted on data security and consumer trust in FinTech adoption in Germany, and there is evidence that risk-averse and overconfident customers are less prone to adopting FinTech services depending on their financial literacy level.

The change becomes even more obvious in the field of automated advice. Research is conducted on the regulation of robot advice, designing robo advice for risk-averse people with a limited budget, and on how perceptions of risk, usefulness and ease-of-use influence consumers' intentions to use AI in their personal investments. Experimental studies have found out that attributing a human-like personality to an AI chatbot makes investors become more risk-averse in their investment decisions. In the most recent period in the dataset, such concepts as artificial intelligence, machine learning, FinTech, ESG and sustainable development became central in the thematic map. This indicates that consumer risks are now influenced by the technology used for investing. (Baker & Dellaert, 2018; Cui, 2022)

1.4 Reviewing, research methods, and research gaps

Various literature reviews have been carried out in order to try to classify parts of this area. Literature reviews have used the Theory, Context, Method and Antecedents, Decisions, and Outcomes approach in relation to retail investor behaviour and used the PRISMA method to conduct a review of 224 papers related to modern portfolio theory which were published from 2019 to 2024. Other literature reviews include generative AI in robo advisory, 15 empirical studies for a meta-analysis of trust in green FinTech adoption, deep learning for credit risk management, and mapping 704 Scopus papers on Islamic crowdfunding. All these demonstrate the application of the various perspectives of reviewing the area under investigation. (Balaskas, 2026; Kumar & Ranjani, 2025; Mienye et al., 2026; Tahvildaria, 2025)

From a methodological point of view, bibliometric review would be most suitable for such a research area. Going through hundreds of articles individually would be a fruitless task. Therefore, bibliometric techniques allow counting publications, authors, sources, countries and keywords to understand the intellectual structure. In this regard, Scopus database was chosen due to its large scope of publications related to business, economy, psychology and finance as well

as standardized metadata. In turn, Web of Science was rejected due to its selective indexing, while Google Scholar was left because of including poor-quality papers. Search included terms 'consumer', 'investment' and 'risk' in title, abstracts and keywords and yielded a large amount of records. Filtering was performed according to the time period, document type (articles and reviews only), language (English) and source type (trade journals were not considered). Then the selected records were analysed in R using Bibliometrix and Biblioshiny visualization tool with the help of VOSviewer for keywords' relations. (Purwatiningsih et al., 2024)

However, there are three major shortcomings here. The first one is a lack of integration. Every review provides a certain depth in its scope, such as portfolio optimisation, robo advising, crowdfunding or credit risk; however, none of them integrates behavioural, investment, risk, technology and regulation components. Secondly, thematic development over time is not traced. Thus, there is no evidence if some topics, such as artificial intelligence, ESG or cryptocurrency become mainstream or remain niche. Thirdly, connection between consumer risk perception and the investment system as a whole is usually not considered.

1.5 Motivation for research

The motivation for the current research emerges from these gaps and fast changes in the field. Earlier reviews noted that decisions of consumers about investments greatly impact trends in the market, while there are few comprehensive reviews of the field. The earlier researches demonstrated that bibliometric mapping could help to analyse trends in publication, keywords and gaps in the field of investment, but it remains focused on one type of products and one context of regulation. (Kumar & Ranjani, 2025)

The objective of the authors is to extend the analysis in the same manner to the entire area of consumer, investment, and risk.

An analysis of the dataset between 2008 and 2027 may reveal areas that have been studied intensively, identify the individuals who have done research in the topic, identify the publications where the research has been done and track the evolution of research interests from risk tolerance and financial literacy to FinTech, AI and sustainability. This will assist the students, researchers, financial organizations and regulators to find out areas where there is strength in knowledge and weakness in knowledge. (Purwatiningsih et al., 2024)

2. Literature Review

2.1 Introduction

Consumer risk in investment decision-making lies at the intersection of consumer behaviour, financial risk and investment choice. In this literature, individuals are considered not only as investors allocating capital but also as consumers who interpret information, evaluate uncertainty and respond to financial products and advice. This perspective is important because investment decisions can affect household savings, portfolio composition and longer-term financial stability. The literature has therefore developed across behavioural finance, consumer studies, financial services and technology-enabled investing rather than within a single disciplinary boundary.

A considerable body of literature has investigated how psychological and socioeconomic factors influence investment behaviour. Recent review evidence indicates that retail-investor research has considered psychological biases, socioeconomic characteristics, financial literacy, global disruptions and technological developments as important antecedents of decisions such as risk-taking and portfolio diversification (Kumar & Ranjani, 2025). Earlier work has also considered how changing consumer needs, saving behaviour and risk management affect the services and investment products offered by financial institutions, particularly as demographic conditions change (Lindbergh et al., 2008).

More recent attention has focused on the digital transformation of investment decision-making. Reviews of portfolio optimisation show increasing use of artificial intelligence for stock-market forecasting, sentiment analysis and model solving, together with growing emphasis on risk measurement, realistic constraints and risk attitudes (Zhao et al., 2025). Similarly, research on robo-advisory has shifted from automated recommendation toward questions of explainability, algorithmic bias, trust, regulation and human oversight (Tahvildaria, 2025). FinTech has also widened access to savings

and investment services, while at the same time creating new forms of technology-related risk for consumers (Morgan, 2022).

The present literature review follows this progression. It first considers the evolution of research on consumer risk and investment decision-making, then examines the major themes that recur across the selected review literature. It next compares the systematic, bibliometric and conceptual reviews that have attempted to organise the field, before bringing the evidence together to identify the principal gaps. The final section positions the present bibliometric study in relation to this earlier work.

2.2 Evolution and Conceptualisation of Consumer Risk in Investment Decision-Making

Research into consumer investment risk has developed from a strong concern with individual financial behaviour toward a broader study of decision-making under technological, market and regulatory uncertainty. The thematic structure generated in the present bibliometric analysis reflects this progression. In the earlier period, 2008–2019, risk, portfolio choice, investment, consumer behaviour and decision-making appear as central basic themes, while financial literacy, investor sentiment and risk aversion also occupy important positionsThis indicates that the preexisting mental model of the field had a significant focus on the way people perceive and react to financial risk. This behaviour is endorsed by the review literature. In their systematic review (264 peer-reviewed articles, published from 2001 to April 2025), Kumar and Ranjani (2025) find psychological biases and socioeconomic factors to be the major determinants of retail investor decisions. They also discuss prospect theory as a prevailing theoretical approach and mention portfolio diversification and risk taking as decision outcomes. These constructs reflect an emerging trend in consumer investment research to regard risk as a behavioural construct, not just as a numerical characteristic of an investment object. A second phase of development has an increased emphasis on uncertainty, resilience and the circumstances affecting the financial decision-makers of consumers and firms. Optimization, uncertainty and resilience are revealed as motor themes in the present bibliometric analysis, together with risk management, sustainability, consumer protection, blockchain and FinTech. The movement is further supported by reviews of the related financial technologies. While FinTech can extend access to savings and investment opportunities for the households, it also raises potential policy challenges that require attention, according to Morgan (2022). Similarly, Purwatiningsih et al. (2024) demonstrate that the study of crowdfunding has been growing more and more, linking the participation of investors and financial opportunity with the risk of investment loss and legal compliance and trust. The latest phase is defined by the increasing relevance of digital technologies and new types of investment intermediation. Bibliometric results identify some recent themes including FinTech, investment, risk management, artificial intelligence, machine learning and sustainability. According to Zhao et al. (2025), there has been growing research that integrates risk measurement and portfolio realistic constraints along with AI in the field of portfolio research, while according to Tahvildaria (2025), explainability, user trust, algorithmic bias and human oversight are some major questions for AI-powered robo-advisory. Similarly, Balaskas (2026) demonstrates that trust is emerging as a key concept in the field of sustainable FinTech adoption, albeit the correlation between trust and the concept of sustainable FinTech differs depending on context and measurement. Put together, these developments suggest a move beyond the traditional questions of risk-tolerance to a deeper understanding on how consumers make investment decisions in today's tech-driven and volatile financial landscape.



Figure 1. Main thematic strands in consumer risk in investment decision-making

Source: Author's synthesis of the selected review literature and the present bibliometric findings.

2.3 Major Themes in Consumer Risk in Investment Decision-Making

Across the review literature, several themes recur consistently: consumer risk perception and risk tolerance, behavioural and socioeconomic influences on investment, portfolio and product choice, and the growing role of FinTech and artificial intelligence. These themes overlap considerably. Risk is shaped by consumer characteristics, the investment product being considered, the information available to the investor and the technological environment in which the decision is made. Figure 1 summarises these thematic strands and their relationship to the overall research area.

2.3.1 Consumer risk perception, tolerance and aversion

Much of the literature takes consumer risk through related constructs such as risk tolerance, risk aversion, perceived risk and risk-taking. Kumar and Ranjani (2025) identify psychological biases as major antecedents of retail-investor decisions and show that risk-taking is one of the principal decision outcomes considered across the literature. This suggests that the same investment opportunity can generate different decisions because consumers do not evaluate uncertainty in identical ways.

The portfolio-optimisation literature provides a complementary perspective. Zhao et al. (2025) find that recent work on modern portfolio theory increasingly addresses risk measurement, risk attitude, realistic constraints and multi-stage portfolio decisions. Risk is explicitly added to the models of portfolio construction in this strand. The review hence focuses on an important distinction in the field, one stream being focused on the consumer's perception and response to risk, another on how investment models measure and manage risk. The combination of these viewpoints is helpful because consumer choices at the end of the day relate to subjective views on risk and a portfolio choice. It is also noted in the literature that risk is context-dependent. Investment loss and non-compliance risk are among the other factors identified by Purwatiningsih et al. (2024) in their bibliometric review of Islamic crowdfunding, other than participation and trust. Similarly, Balaskas (2026) concludes that there is considerable variation in the relationships between trust and intention to use green FinTech. The results indicate that no distinction can be made between consumer reactions and the institutional/products level where the risk is communicated. Investors' investing preferences, expectations and attitudes, as well as their social, demographic, and financial conditions. Many aspects of consumer investment research are related to factors influencing financial decision making. Kumar and Ranjani (2025) conducted a comprehensive review of the literature and found that the following are common factors that are commonly associated with the retail investor behaviour: psychological biases, socioeconomic factors, financial literacy and broader market disruptions. The prospect theory is a key theoretical framework which further underscores the need for a behavioural and not solely rational explanation of investment decisions. Review literature also indicates that the consumer-investor relationship is not

limited to just the immediate purchase of a financial product. Lindbergh et al. (2008) elaborate the implications of the demographic ageing for saving, asset accumulation, risk aversion and the design of financial products. They claim that an analysis based on review should lead to a focus on consumer demand, and so on the need for financial education and products better suited to the risk and saving needs of the household. This is a precursor to the recent literature on digital investment, but it is useful to demonstrate that characteristics of consumers and life-cycle requirements have long been features of investment-risk discussions. In general, the findings suggest that a combination of individual traits and the choice context is the source of investment behavior. Financial literacy could impact consumers' perception of an investment opportunity, psychological biases could influence the assessment of the opportunity, and socioeconomic or demographic traits could influence the outcomes of selecting a higher or lower risk asset. The literature then considers the investor as a consumer and his decision-making process as influenced by both personal and contextual factors.

2.3.2 Portfolio choice and investment products

Portfolio choice forms a second major strand of the literature. Zhao et al. (2025) review 224 academic articles published between 2019 and 2024 and report that enhancements to modern portfolio theory have concentrated on risk measurement, realistic constraints, risk attitudes and multi-stage portfolios. This indicates that portfolio research increasingly seeks to make optimisation models more consistent with the conditions under which actual investors make decisions.

Kumar and Ranjani (2025) approach investment from the consumer side and report that portfolio diversification and risk-taking are important decision outcomes within retail-investor research. The two reviews therefore address complementary levels of analysis. Portfolio-optimisation studies focus on the construction of investment solutions, while consumer-investment studies focus more directly on the antecedents of whether and how individuals adopt those solutions.

The review literature also shows that the range of investment products considered by consumers has expanded. Purwatiningsih et al. (2024) map the development of Islamic crowdfunding and note its potential to widen participation while also creating investment-loss and compliance risks. Morgan (2022) similarly discusses FinTech as a channel through which consumers can obtain access to savings and investment products. These developments suggest that the meaning of investment risk is increasingly linked not only to asset characteristics but also to the design, accessibility and governance of the platform through which the investment is offered.

2.3.3 FinTech, robo-advisory and artificial intelligence

In more recent literature, technology has been increasingly seen not only as a component of the investment decision itself, but also as a factor to be considered as part of the investment. In his research, Morgan (2022) acknowledges the potential for FinTech to bring finance to the masses and outlines some of the hazards that stem from its application. The technology thus serves two functions: it can help to lower the barriers to financial participation simultaneously, and it can raise novel concerns regarding information, security, suitability and regulation. Robo-advisory is a more direct transformation in the investment decision making process. Automated financial-product advisors can assist consumers in choosing investments, banking products and insurance policies, helping to lower the cost and make the advice more transparent, according to Baker and Dellaert (2018). Meanwhile, they cite regulatory concerns related to scale as automated systems can make recommendations to many consumers. Consumer risk is therefore bi-fold: technology has the potential to create more uniform and more accessible access, but can also have a greater impact of the undesirable consequences of poorly designed advice. Tahvildaria (2025) illustrates how this debate has progressed with the advent of generative AI. When it comes to the benefits of AI for advisory, the systematic review finds that portfolio optimisation, risk assessment and decision support are key factors; however, algorithmic bias, explainability, user trust and regulatory fragmentation remain challenges. The review suggests that explainable AI and hybrid AI-human oversight are important topics for addressing algorithm aversion and concerns surrounding transparency. The importance of financial education and the use of open and transparent risk assessments are also stressed as tools for enhancing user acceptance. This is a sign that technology adoption is inextricable from consumer psychology, and that investors have a need to be able to understand how recommendations are being generated. The broader body of risk modelling literature is on point as well. Mienye et al. (2026) provide an overview of credit-risk prediction using deep learning in corporate, consumer and peer-to-peer lending and their application's increasing significance in capturing non-linear and complex relationships in financial data. The emphasis is on credit and not on investment selection, but this book is part of a trend

towards a data-driven approach to risk assessment. In the investment world, the question is not just whether the advanced models can yield better predictions but how the increased complexity of models, transparency and governance will impact consumers' confidence and decision quality.

2.3.4 Trust, regulation and sustainability

There has been a growing emphasis on trust and regulation in the context of increasing digitisation of investment services. Based on a literature review of 15 empirical studies that examine the relationship between trust and intention in the adoption of green and sustainable FinTech, Balaskas (2026) concludes that the trust-intention relationship is generally positive and significant, yet highly heterogeneous. The review also highlights measurement issues of consistency and separates provider trust from platform/technology trust from the credibility of sustainability claims. The differences between these are significant for risk to consumers, since an investor may be willing to deal with a financial institution but be unsure of the technology employed, or the authenticity of an investment claim. The same applies to regulation, which is also described as a part of the consumer decision environment. Baker and Dellaert (2018) highlight the difficulties faced by regulators as they consider evaluating automated financial advice, and Tahvildaria (2025) points to regulatory fragmentation as a hurdle to the responsible use of generative-AI in robo-advisory. Similarly, Purwatiningsih et al. (2024) indicate that in Islamic crowdfunding, the regulatory uncertainty of not having specific regulations may cause uncertainty and risk of non-compliance and investment losses. This environment is further complicated by sustainability. The present bibliometric analysis indicates that the topic of sustainable development, ESG and climate risk is increasingly visible in the latest timeframe. According to reviews of FinTech and portfolio optimisation, technology, risk assessment and investment products are becoming more relevant to the sustainable finance issues (Balaskas, 2026; Zhao et al., 2025). The wider literature accordingly indicates a growing context where consumers are making investment decisions in environments where financial risk, technological risk, regulatory risk and sustainability claims may intermingle.

2.4 Technology and the Changing Investment Decision Environment

Technology and the investment environment of consumers have undergone a significant transformation and that is reflected in the literature. Previous research mainly concerned with saving and risk management and financial product adaptation to consumer attributes. Recent studies reveal that investments are increasingly being guided through digital platforms, algorithmic advice and data-driven models. The change reflects in the current bibliometric analysis, which can be divided into two segments: the thematic structure was changed from risk, financial literacy and consumer behaviour to FinTech, AI, machine learning, cryptocurrency and sustainability. An important aspect of automated advice is its impact on the source of investment information for consumers. Consumers can increasingly get recommendations from algorithms, not just from a human adviser or via self-directed research. Explainability and human oversight and onboarding are needed to increase the acceptance of such systems (Tahvildaria 2025). A similar finding is presented by Balaskas (2026) who indicates that trust continues to be a key factor in technology adoption. The results suggest that not all risk of the asset is relevant to consumers' risk, but uncertainty regarding the technology and institutions associated with the decision can also pose a risk. Meanwhile, technology can help to enhance the analytical power that consumers and financial institutions have at their fingertips. Zhao et al. (2025) outline the use of AI in stock-market prediction, sentiment analysis and solving financial models, and Mienye et al. (2026) demonstrate the capabilities of deep-learning algorithms in financial risk data, which can highlight intricate patterns. The key consumer dilemma is, however, one of balancing the benefits of advanced tools versus the risks of greater complexity and opacity that they can introduce in terms of behavioural and regulatory risk.

2.5 Development of Systematic and Bibliometric Research

As the literature on consumer investment risk has expanded, researchers have increasingly turned to systematic, bibliometric and structured reviews to organise what is otherwise a fragmented field. The selected review papers differ substantially in their corpus, disciplinary focus and analytical approach. Table 1 summarises the main studies that are most relevant to the present research question.

Table 1. Comparison of major review studies relevant to consumer risk and investment decision-making

Study	Purpose	Corpus and period	Method	Main themes or contribution
Baker & Dellaert (2018)	Examine the regulation of automated financial-product advice and its implications for consumers	Conceptual review of robo-advice across financial services	Conceptual / legal analysis	Consumer choice, suitability, transparency, scale risks and regulatory capacity
Morgan (2022)	Examine FinTech and financial inclusion in Southeast Asia and India	Regional literature and policy evidence; ASEAN and India	Review / policy analysis	Access to savings and investment, FinTech opportunities, risks and policy implications
Purwatiningsih et al. (2024)	Map the development and research gaps of Islamic crowdfunding	704 Scopus articles, 2013–2022	Bibliometric literature review	Publication trends, keywords, investment losses, regulation, trust and participation
Kumar & Ranjani (2025)	Synthesise research on retail-investor investment behaviour	264 peer-reviewed articles, 2001–April 2025	Systematic review using TCM and ADO	Prospect theory, psychological biases, socioeconomic factors, disruptions, technology, risk-taking and diversification
Zhao et al. (2025)	Assess recent developments in modern portfolio theory and identify future research	224 academic articles, 2019–2024	Systematic review using PRISMA	Risk measurement, constraints, risk attitude, portfolio optimisation and AI applications
Tahvildaria (2025)	Assess opportunities and challenges of generative AI in robo-advisory	Recent literature on AI-enabled financial advisory	Systematic literature review with TOWS-based framework	XAI, hybrid human oversight, bias, explainability, trust, financial literacy and regulation
Balaskas (2026)	Assess the role of trust in green and sustainable FinTech adoption	15 empirical studies; Scopus and Web of Science, 2015–2026	Systematic review and random-effects meta-analysis	Trust as predictor/mediator, adoption intention, heterogeneity, greenwashing and measurement issues

Study	Purpose	Corpus and period	Method	Main themes or contribution
Mienye et al. (2026)	Review deep-learning methods for credit-risk prediction and identify open challenges	Peer-reviewed applications across corporate, consumer and peer-to-peer lending	Survey / comprehensive review	Deep-learning architectures, consumer credit risk, prediction performance and trustworthy deployment

The earliest of the selected studies approaches investment risk mainly through financial-service design and regulation. Baker and Dellaert (2018) examine robo-advice as a new form of automated financial intermediation and emphasise consumer suitability and regulatory capacity. Morgan (2022) broadens the perspective by considering FinTech and financial inclusion in Southeast Asia and India, linking access to savings and investment with potential technology-related risks. These studies are useful because they establish the institutional and technological setting in which consumers make financial decisions.

The literature then becomes more explicitly bibliometric and systematic. Purwatiningsih et al. (2024) analysed 704 Scopus-indexed articles on Islamic crowdfunding and identified an interdisciplinary research base in which community participation, investment opportunity, investment loss, legislation and trust are closely connected. The study demonstrates the value of bibliometric mapping for an investment-related field but remains specific to a particular financial product and regulatory context.

Kumar and Ranjani (2025) provide the closest review to the present topic. Their TCM–ADO synthesis covers 264 peer-reviewed articles and identifies theories, contexts, methods and antecedents of retail-investor behaviour. Their findings connect psychological biases, socioeconomic variables, financial literacy, disruptions and digital technologies with decisions such as risk-taking and portfolio diversification. However, the review is primarily organised around investment behaviour rather than the broader bibliometric structure of the consumer–investment–risk nexus.

Zhao et al. (2025) and Tahvildaria (2025) examine newer technological and analytical dimensions. Zhao et al. focus on portfolio optimisation and show that research is moving toward AI-enabled forecasting, sentiment analysis and model solving. Tahvildaria, by contrast, concentrates on generative AI in robo-advisory and highlights the importance of explainability, trust, algorithmic bias and human oversight. Balaskas (2026) narrows the focus further to trust in green FinTech adoption, using meta-analysis to show a positive but heterogeneous relationship between trust and adoption intention. Mienye et al. (2026) review advanced machine-learning methods for credit risk, showing how risk assessment itself is becoming increasingly data-intensive. Taken together, these reviews demonstrate that the field is expanding across several specialised streams rather than developing as one unified research programme.

These studies show three general differences in comparing them. First, the studies span populations and contexts of decision making, from retail investors and consumers to users of various technologies and financial products. Second, they employ various review techniques such as conceptual analysis, regional review, bibliometric mapping, systematic review and meta-analysis. Thirdly, they have different time windows and databases. The findings are thus complementary, not comparable, and a wide-ranging corpus-level bibliometric review can serve as a helpful common compass point between these strands.

2.6 Critical Synthesis and Research Gap

A comprehensive picture comes across from reading together the selected reviews. Consumer investment research has confirmed that there are behavioural, socioeconomic and contextual factors that affect financial decisions and portfolio research has included the use of risk attitudes and more realistic optimisation constraints. Meanwhile, the financial information and investment advice landscape is being transformed by FinTech and AI. As a result, the principles of trust, regulation, explainability and sustainability have become more prominent than traditional considerations around risk/return. The literature is, however, split between these points of view. Kumar and Ranjani (2025) give a comprehensive overview of retail-investor behaviour focusing on the proximate determinants, choice and consequences

of investment behaviour. While Zhao et al. (2025) offer a general overview of portfolio optimisation, their primary focus is not on the consumer aspect. Tahvildaria (2025) and Balaskas (2026) focus on specific technology-driven adoption questions, while Purwatiningsih et al. (2024) concentrate on Islamic crowdfunding. Mienye et al. (2026) examine the modelling of credit risk rather than investment choice. Each review therefore provides depth within a particular stream, but no single review in the selected set brings together the behavioural, investment, risk, technological and regulatory dimensions across the whole literature.

The second gap is to do with thematic evolution. The current bibliometric analysis indicates that the intellectual landscape of the field has evolved over the years from the focus on risk, financial literacy, portfolio selection and consumer behaviour to uncertainty, optimisation, FinTech, AI, machine learning, sustainability and ESG. This implies the definition of consumer risk is also evolving with the increasing technology-mediated nature of investment decisions. Shorthanded reviews of a part of the field or a particular subdomain type cannot adequately show whether these newer themes are expanding to become more central topics of the field or if they are more of a specialized area of study. Another gap is one between consumer level risk and investment systems. The literature on the topic of the review is largely focused on either the individual investor, the portfolio model or the technology platform. What's not so obvious is the way these elements are connected and how consumers' perceptions of risk and tolerances relate to portfolio models, digital advice, trust, regulation and emerging new investment products. This holistic view is particularly important as investment decision making takes place in a digital context where technology and consumer psychology cannot be separated. The point is not that there has been an underinvestment in consumer investment risk. In contrast, there is a large and growing amount of research, and a few specific reviews that have furthered the knowledge of significant subfields. Instead, the literature has branched out in several directions, and the structure of the themes has been evolving. A wider bibliometric mapping study can shed light on the interconnections of the research streams, on the prevalent themes across the field, and on the emerging themes located at the nexus of consumer behaviour, investment and risk.

2.7 Research Niche and the Present Study

In light of this background, the current study conducts a bibliometric analysis of the research on consumer risk in investment decision making. It is not intended to replace the existing systematic and thematic reviews, but to supplement them by probing the literature of the three core concepts that are the intersection of the three: consumer, investment, risk. Scopus is used for the study as the database and the bibliometric techniques are Bibliometrix/Biblioshiny and the VOSviewer which are used to study the publication trends, countries, sources, relationships and thematic evolution of the keywords.

There are several ways the study differs from the previous reviews. As a content, it is more comprehensive than research that focuses on portfolio optimisation, robo-advisory, green FinTech, crowdfunding or credit-risk modelling. In the analytical scope it takes into account the structure of the literature being analysed but does not just summarise results within a given structure. Temporal perspective looks at the field's development over time, rather than at individual research themes, and allows for the transition from behavioural and risk-tolerance themes to technology and sustainability to be assessed as an ongoing progression.

This positioning is supported by the present bibliometric results. The group analysed a final dataset of 1,656 documents, with an evident growth in the last years. This thematic development highlights a sequence from Investment – Risk – Financial Literacy and Investor behaviour – Consumer Protection – Uncertainty – Optimisation – FinTech – Risk aversion – Ai/Ml, ESG and Sustainable development. This is an important study for understanding how the consumer-risk-investment relationship is becoming more technologically and institutionally complex and how the research agenda is broadening.

In summary, the existing literature shows that consumer investment decisions are shaped by risk attitudes, behavioural factors, financial knowledge, product characteristics and the wider decision environment. Review studies also demonstrate that technology is increasingly embedded in investment advice, portfolio optimisation and risk assessment. The research gap lies less in the absence of studies than in the fragmentation of these strands. An updated, corpus-level bibliometric review can therefore provide a clearer picture of the development, thematic structure and emerging directions of research on consumer risk in investment decision-making.

3. Objectives

RQ1: How has consumer risk in investment decision making research progressed since 2008 until 2027, and what can be revealed by the trends in the publications?

RQ2: What are the countries, sources and keywords that create the intellectual structure of the research field?

RQ3: How have the important research themes changed in the following periods: 2008–2019, 2020–2024 and 2025–2027?

RQ4: What research gaps and future directions can be identified in relation to consumer behaviour, technology, sustainability and regulation?

The remaining part of the article is provided below.

4. Methodology

4.1 Research Framework

The data collection method used is a bibliometric review. A bibliometric review is a quantitative method that analyzes published literature and documents the intellectual structure in terms of authors, keywords, co-citation networks, and publication trends and establishes influential authors, journals, and emerging trends in a research field. The study chose an interdisciplinary area, consumer risk in the investment decision making process, which is too broad to narrow down to other disciplines and was concluded using a bibliometric approach after an initial Scopus search. It would have been impractical, within the limits of this project, to read and synthesise each of the thousands of papers available about this topic individually. A systematic, data-driven bibliometric review would have been the more practical and rigorous way to proceed. A study specifically focuses on consumers' perception, evaluation and reaction to risk when they make investments — a nexus of consumer behaviour and financial decision making. The intersection is significant for several reasons: first, consumers' risk perception affects their savings behaviors, asset composition decisions, and financial status. The PRISMA flow diagram below shows how the original range of records was gradually reduced to the final records used for the analysis.

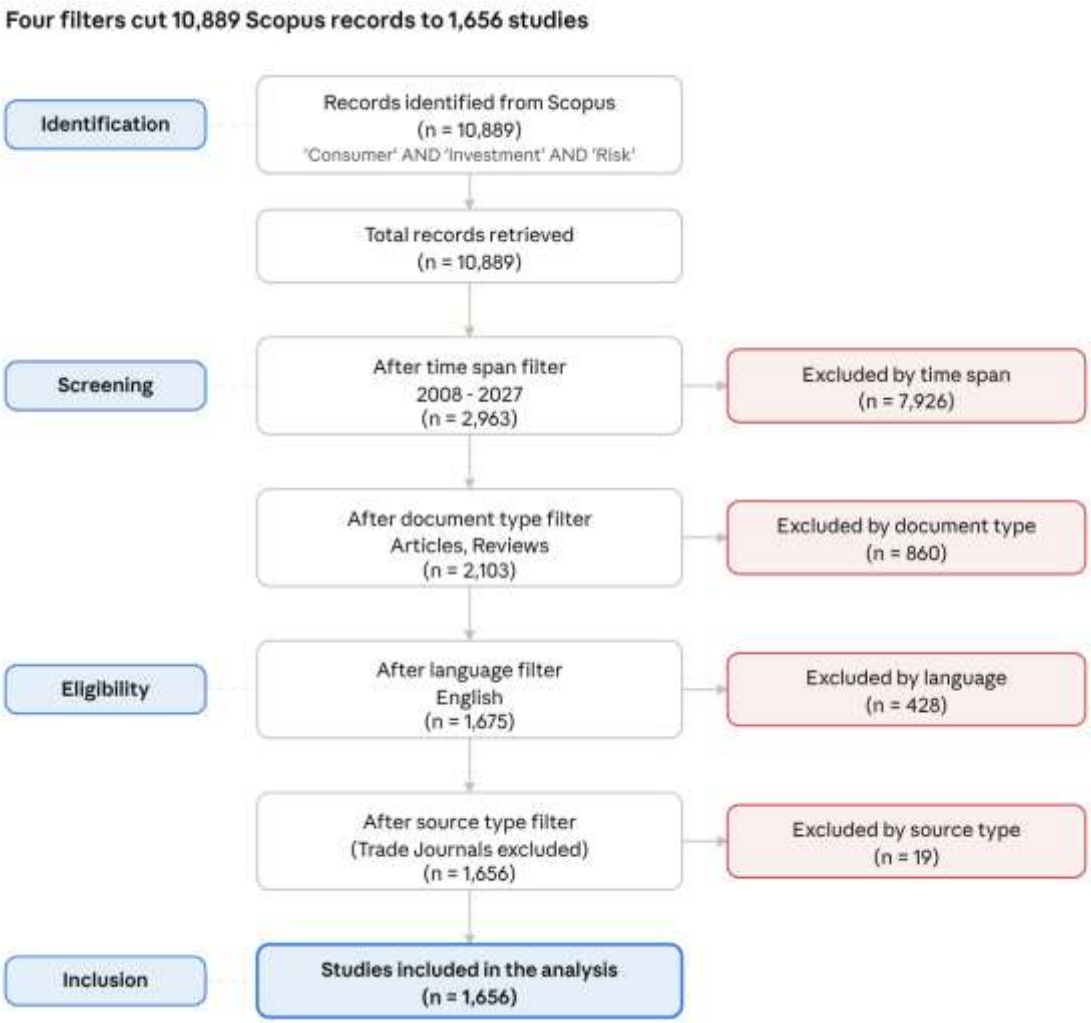


Figure 2. PRISMA flow · 4 filters, 10,889 to 1,656 records

The counts shown are the records remaining after each filter.

4.2 Selecting a suitable database

It was decided that Scopus will be chosen as the only database for the review. With extensive coverage across disciplines most relevant to the study of consumer risk, business, economics, psychology and finance, Scopus is one of the world's largest curated abstract and citation databases of peer-reviewed literature. Another advantage of Scopus is the provision of standardised metadata, such as author keywords, affiliations, comprehensive cited-reference information etc., that are needed by both bibliometric software and analysis tools like Bibliometrix and VOSviewer, respectively, to carry out citation analysis and co-occurrence analysis. Web of Science was not used because its indexing policy is more restrictive, and this would have been at the expense of excluding a considerable number of journals that would have been relevant to the applied research on consumer and behavioural finance. Google Scholar was also eliminated due to the occasional inclusion of student papers, working papers and poor quality documents, lowering the quality of the data.

4.3 Use of keywords for the initial search

The method of searching was performed in the Scopus database through the use of the following key words: consumer AND investment AND risk in the article title, abstract and keyword fields. A narrower search based on specific risk constructs (e.g. risk tolerance or risk perception) was considered but not pursued because it would exclude relevant studies using other terms for the same construct. By contrast, a wider search on "risk" AND "investment" was also declined as it would pull back an unmanageable number of hits, mostly from a purely financial/actuarial risk modelling stream, which relates very little to consumer behavior. The three-term combination was felt to be the most suitable to balance specificity and comprehensiveness of the topics. The first search yielded 10,889 results. The dataset was narrowed down from an initial set of records to a set of final records to analyze, using four filters one after another.

4.4 Filtering

4.4.1 Time Span

The data were limited to 2008–2027, which resulted in a smaller number of papers. However, there were papers available from 1968 but to ensure that the data included in the research paper is up-to-date, only the last two decades were considered. 2,963 records were returned for the time period (2008–2027) after the remaining papers were eliminated from the 10,889 papers in the sample. The window was chosen for timelines corresponding to the past two decades as investor investment behaviour has significantly shifted over this period. The date of 2027 was slightly extended to allow for articles published online (early access) before their official publication date.

4.4.2 Document Type

The document type was restricted to those articles and review papers which are published in journals only and this reduced the data set to 2,103 from 2,963. The nature of book chapters, Editorial, Notes/letters does not have the same standard of peer review, or necessarily a contribution to research, and so are not as completely or as consistently indexed in the Scopus.

4.4.3 Language

The number of records used in the dataset that were not available in the English language were excluded. This brought the research paper count to 1,675 records from 2,103 records. The latter is also a practical need when using tools like bibliometrix to analyse keyword and title co-occurrence studies in published consumer behaviour, behavioural finance and economic research as identical concepts in different languages would otherwise be considered as unrelated terms and artificially split the keyword network. The authors of this research paper can also only read and validate content available in the English language. Only a small portion of the dataset was removed using this filter, and so it is unlikely to have had a significant impact on representativeness of the final results.

4.4.4 Source type

The number of records in the dataset has been reduced by excluding trade journal sources (1,656 records remaining). Such publications are usually of an industry rather than academic nature, they focus on the practitioners needs and are not subject to the same high academic standards as are academic journals. The removal of this small number of records ensures that only academic literature published through peer-review will be included in the dataset.

4.5 Final Dataset Obtained

After the process of using keywords to search followed by filtering to obtain the most relevant research papers, there were a total of 1,656 records that were usable for this research paper. The final dataset was exported from Scopus on 17 September 2026 and finally imported into R using Bibliometrix.

4.6 Limitations

Although the entire research process was carried out smoothly and methodologically, a few barriers that limited the scope of research include language, tools used and time constraints. The wide range of data available initially could not practically be analysed due to time constraints which is why it is possible that some relevant papers may have been excluded through filtering in this process. Due to language barriers, only papers in English language were taken into consideration however, it is possible that papers written in other languages consisted of more relevant and comprehensive data in relation to the topic. Lastly, only the Scopus database was used as a tool to support this research methodology and conduct the process of finding relevant research papers; however, it is possible that other platforms would have also provided more relevant results.

5. Results and Discussion

5.1 Main information

To understand how research on consumer risk in investment decision making has developed, a bibliometric analysis was carried out using the Bibliometrix R-package and its Biblioshiny interface. The final dataset was exported from Scopus on 17 September 2026 and contains 1,656 documents published in 1,009 different sources between 2008 and 2027. The

fact that these papers are spread across so many sources suggests that the topic does not belong to a single discipline. Instead, it draws on consumer finance, energy economics and operations research (Yao et al., 2011; Assaf et al., 2021; Jin et al., 2022). The two records dated 2027 are papers that were released online ahead of their official publication year.

At first sight, the annual growth rate of −12.8% appears surprising for a field that is clearly expanding. However, this figure should be interpreted with caution. Biblioshiny calculates the rate from the first and the last year of the dataset, and the last year, 2027, contains only two early-access papers. If 2026 is taken as the end point instead, output rises from 27 documents in 2008 to 205 in 2026, which is a compound growth of about 12% per year (about 13% if the complete year 2025 is used). Because the data were collected in September 2026, the figure for 2026 is still incomplete. This growth matches the rising curve in the Annual Scientific Production chart.

A total of 4,984 authors contributed to this body of work, and only 268 of them wrote single-authored papers. On average, each document has 3.32 co-authors, which shows that research in this area is mostly team-based. About 26.63% of the documents involve authors from more than one country. This means that roughly one in four studies is an international collaboration, while the majority are still carried out within one country. The dataset also contains 5,645 unique author keywords, which reflects the wide range of topics covered, from retirement investment advice and cryptocurrency ownership to ESG investment (Goldstein et al., 2008; Hayashi & Routh, 2025; Rabbani et al., 2025).

The average document age is 5.72 years, so a large part of the research is recent. Even so, each document has received 22 citations on average, which suggests that the topic is being read and built upon. One limitation should be noted. The Scopus export did not include cited references (References = 0), so analyses that depend on them, such as co-citation analysis, could not be carried out.

5.2 Annual Production Chart

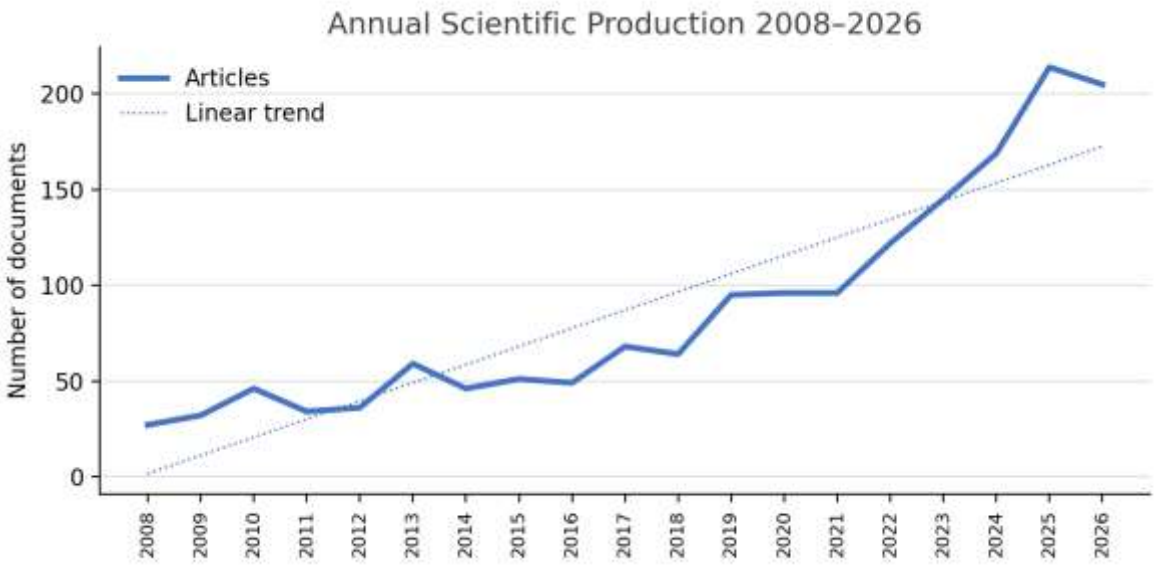


Figure 3. Annual publication output on consumer risk in investment decision making, 2008–2026.

The Annual Scientific Production chart shows how many documents were published each year on consumer risk in investment decision making between 2008 and 2026. The year 2027 is left out because it contains only two early-access papers. As can be seen from Figure 3, output rose from 27 documents in 2008 to 214 in 2025, and the field has passed through three fairly clear stages of growth.

From 2008 to 2018, output stayed low, with between 27 and 68 documents a year (512 documents in total, about 31% of the dataset). Early work in this period focused mainly on how individual investors choose retirement investments and how their willingness to take financial risk can be measured (Goldstein et al., 2008; Gilliam et al., 2010; Yao et al., 2011).

Between 2019 and 2021, output moved to a higher level of about 95 documents a year (95, 96 and 96) and then stayed flat. After 2021, the numbers rose again, from 122 in 2022 to 145 in 2023 and 169 in 2024. A possible explanation for this rise is the COVID-19 pandemic, which changed how willing investors were to take financial risk (Heo et al., 2021).

Another possible reason is the growing interest in new investment products such as cryptocurrency (Hayashi & Routh, 2025; Kim & Fan, 2025).

What stands out in this chart is the sharp increase after 2021. Output grew from 96 documents in 2021 to 214 in 2025, and the last three years (2024–2026) account for 588 documents, or about 36% of the whole dataset. The value for 2026 (205) is slightly lower than for 2025, but it covers only the months up to September, so it should not be read as a decline. The straight trend line adds about 9.5 documents per year ($R^2 = 0.84$). The actual values lie below this line for most of the 2010s and move above it from about 2023, which means that growth has recently been faster than a straight line would suggest.

5.3 Three Fields Plot

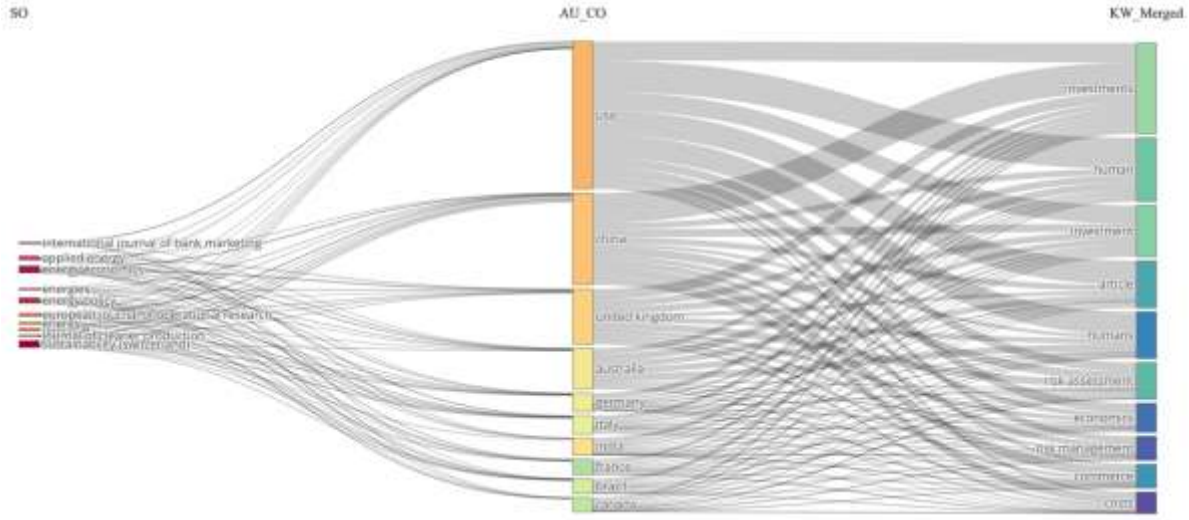


Figure 4. Three-Fields Plot showing the relationship between sources (left), countries (middle) and keywords (right).

The Three-Fields Plot links three parts of the dataset: sources on the left, countries in the middle and keywords on the right. The thickness of each band shows how often these elements are connected, which gives an overall picture of where the research is published, who publishes it and what it is about.

1. **Leading countries:** The USA forms the largest block, followed by China, the United Kingdom and Australia. Germany, Italy, India, France, Brazil and Canada form smaller blocks. This spread across North America, Europe, Asia and Oceania shows that investment risk is studied as a global issue. Consumer-finance studies based on US survey data (Yao et al., 2011) and on Indian investors (Sivaramakrishnan et al., 2017) are two examples of this.

2. **Sources:** Most of the sources in the plot are energy and sustainability journals, such as Energy Economics, Energy Policy, Applied Energy, Energies, Energy, Journal of Cleaner Production and Sustainability. Only a few, namely International Journal of Bank Marketing, PLOS ONE and European Journal of Operational Research, come from other fields. This shows that research on investment risk is often published in energy outlets (Gross et al., 2010; Wu & Hu, 2019). The source blocks are small and fairly similar in size, which suggests that no single journal dominates.

3. **Keywords:** The most visible keywords are investments, investment, risk assessment, risk management, economics, commerce and costs. The keywords “human”, “humans” and “article” are database indexing tags rather than research topics, so they should not be interpreted. The presence of risk assessment and risk management next to investment shows that the core of the field is how risk is judged and managed when investment decisions are made (Disatnik & Steinhart, 2015).

5.4 Sources' Production over Time

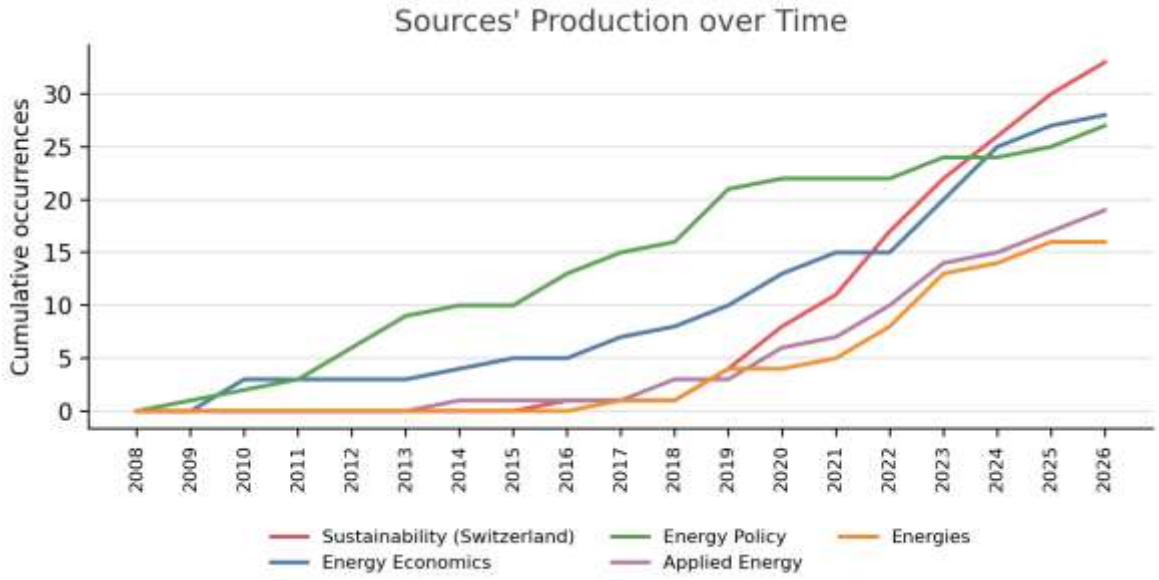


Figure 5. Cumulative number of documents in the five most productive sources (2008–2026).

The Sources' Production over Time chart shows how the cumulative number of documents in the five leading sources grew between 2008 and 2026. It shows not only which source is largest today, but also when each one became important. The values for 2026 are incomplete because the data were collected in September 2026.

Energy Policy was the earliest and most consistent contributor. It published its first paper in 2009, reached 10 papers by 2014 and 22 by 2020, and it stayed the leading source until 2023. After 2020, however, its growth slowed, reaching 27 papers by 2026. *Energy Economics*published its first paper in 2010 and grew slowly until about 2022 (15 papers). It then rose quickly to 28 by 2026, which fits its recent work on ESG investment as a safe haven for portfolios (Ahad et al., 2024).

Sustainability (Switzerland) shows the most dramatic change. It published its first paper in 2016 and had only 4 by 2019, but it then grew to 17 papers in 2022 and 33 in 2026. In 2024 it overtook *Energy Policy* and became the largest source. Studies on ESG performance and corporate value are typical of this journal (Kong et al., 2023). *Applied Energy* (first paper in 2014) and *Energies* (first paper in 2017) also started small and grew mainly after 2019, ending with 19 and 16 papers.

Taken together, the five lines show that four of the five sources grew mainly after 2019, which is consistent with the rise in total output seen in Figure 3. *Energy Policy* is the exception, as most of its growth came earlier. It is also worth noting that all five sources belong to the energy and sustainability group. International Journal of Bank Marketing, the main finance-related source, has the same total as *Energies* (16 documents) but did not enter the top five.

5.5 Most Relevant Sources

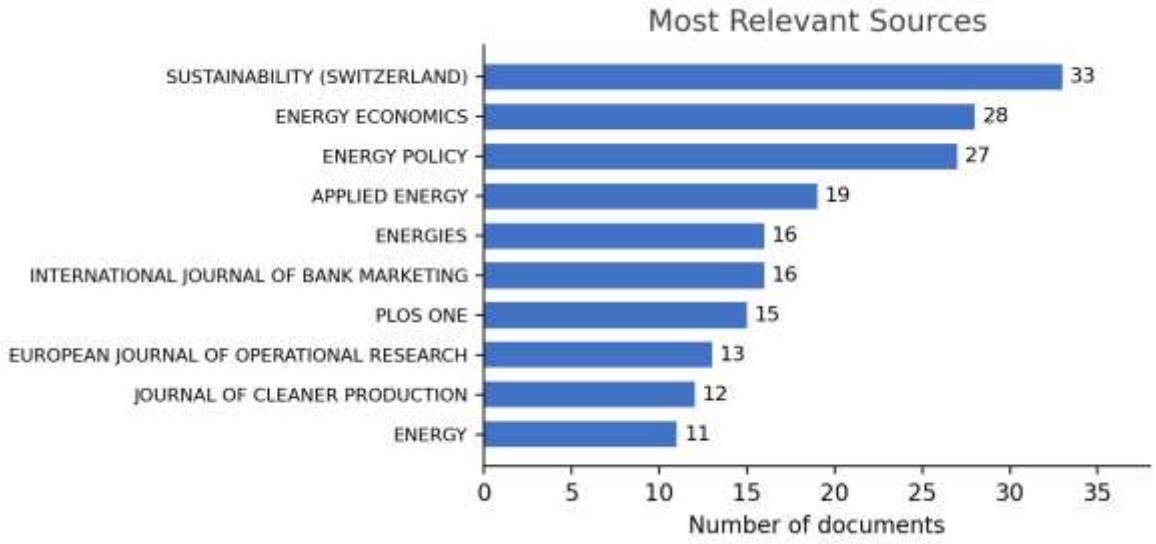


Figure 6. Ten most relevant sources by number of documents.

The figure lists the ten most productive sources in the dataset, each with at least 11 documents. It shows where the core research on this topic is being shared.

1. **Leading sources:** Sustainability (Switzerland) leads with 33 documents, followed by Energy Economics (28) and Energy Policy (27). These journals publish work that links investment decisions with ESG performance, energy markets and corporate risk (Ahad et al., 2024; Kong et al., 2023; Wu & Hu, 2019).

2. **Energy and sustainability journals:** Applied Energy (19), Energies (16), Journal of Cleaner Production (12) and Energy (11) complete a strong group of energy-related outlets. The five energy-titled journals (Energy Economics, Energy Policy, Applied Energy, Energies and Energy) hold 101 documents, which is about 6% of the dataset.

3. **Finance and consumer journals:** International Journal of Bank Marketing (16) is the main source for studies on consumer investment behaviour, for example on stock market participation, AI chatbots and cryptocurrency investment (Sivaramakrishnan et al., 2017; Cui, 2022; Kim & Fan, 2025). PLOS ONE (15) is a general science journal that covers many fields.

4. **Operations research:** European Journal of Operational Research (13) publishes the modelling side of the topic, such as game-theoretic models of green investment that include a bank's risk preference (Jin et al., 2022).

5. **Spread of the literature:** Together, the ten sources hold 190 of the 1,656 documents, or about 11%. The rest are spread across about 1,000 other sources, and 758 of the 1,009 sources (about 75%) contributed only one document. This pattern, with a small core and a long tail, confirms that the field is interdisciplinary.

5.6 Countries Production over Time

The following charts show the cumulative number of publications of the five most productive countries, as counted by Biblioshiny. A straight trend line was added to each chart. The slope of the line shows the average number of publications added each year, and the R^2 value shows how well a straight line describes the growth. The year 2027 is excluded.

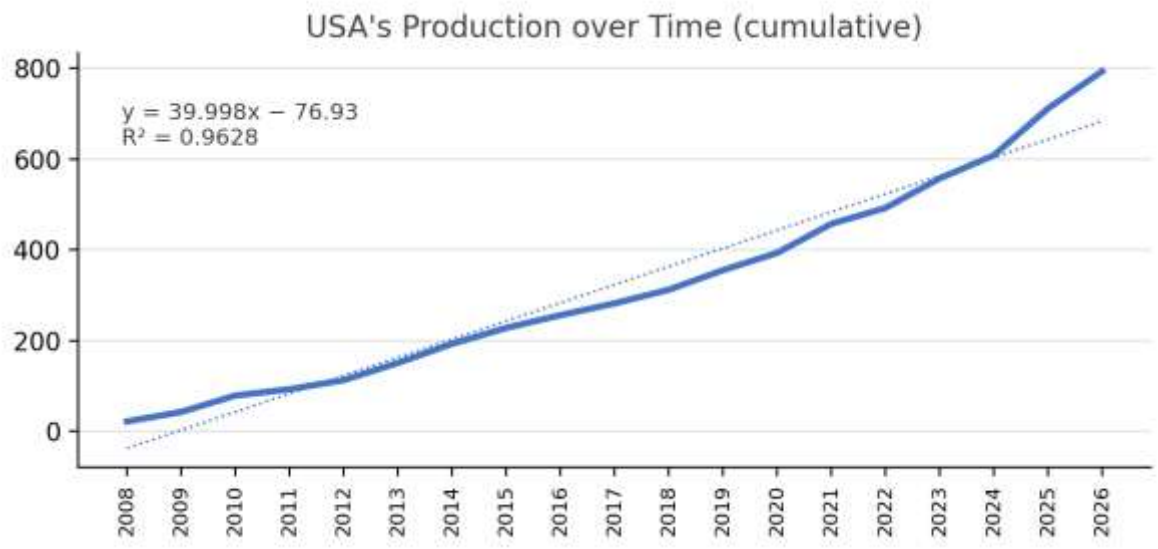


Figure 7. Cumulative publication output of the USA.

The USA's trend line, y = 39.998x − 76.93, has the steepest slope of the five countries, meaning that the USA adds about 40 publications per year on average. It also has the strongest fit (R^2 = 0.9628), which shows that its output has grown steadily from 22 in 2008 to 793 by 2026. Even so, the actual value for 2026 is above the 683 predicted by the trend line, so growth has also picked up in recent years. Examples of US work are studies based on household and investor data (Yao et al., 2011; Heo et al., 2021).

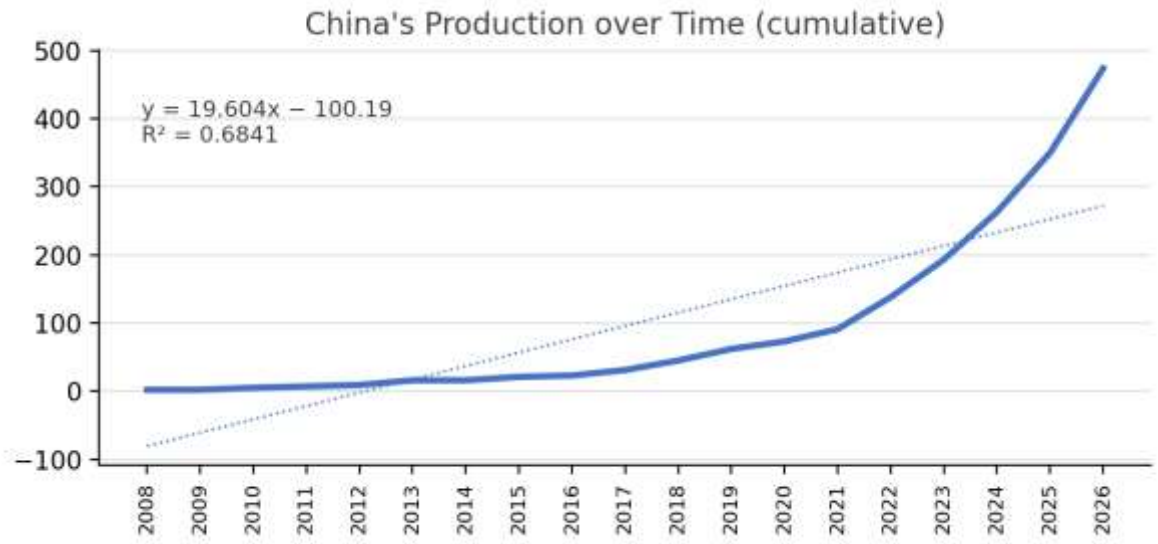


Figure 8. Cumulative publication output of China.

China's trend line, y = 19.604x − 100.19, has the second-highest slope but the lowest R^2 value (0.6841). This is because China's output stayed low for a long time (45 by 2018) and then rose quickly, reaching 474 by 2026 compared with about 272 predicted by the line. China passed the United Kingdom in 2023 (193 compared with 188). Recent Chinese contributions include studies of green investment and carbon policy (Fan et al., 2023; Jin et al., 2022).

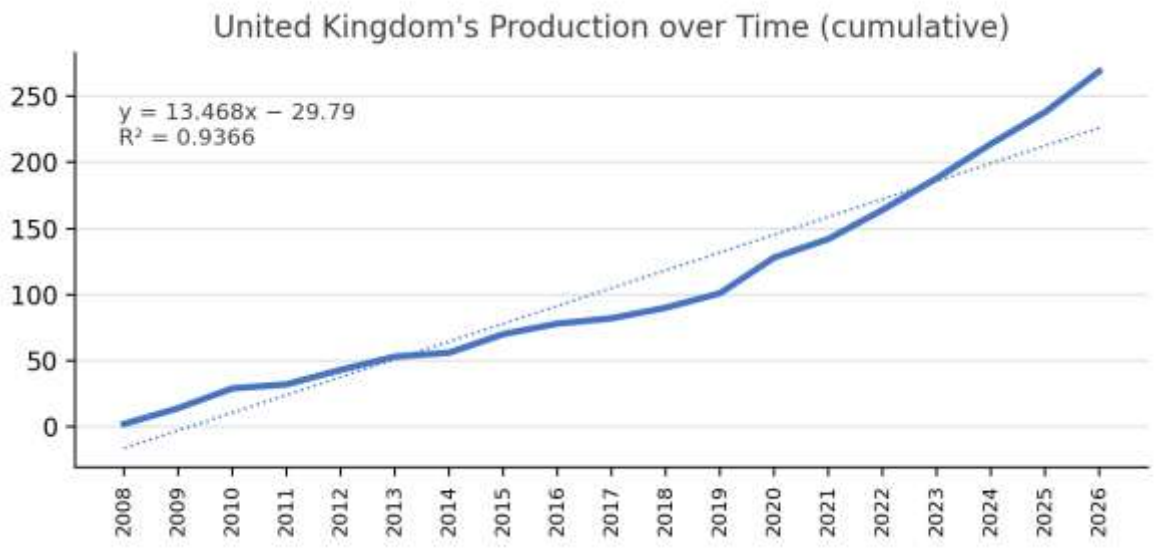


Figure 9. Cumulative publication output of the United Kingdom.

The United Kingdom's trend line, y = 13.468x − 29.79, has a high R^2 value (0.9366), which indicates steady growth. The UK started early, with 14 publications by 2009 and 53 by 2013, ahead of China, India and Australia at that time. It reached 269 by 2026, above the 226 predicted by the line. Early UK work includes research on the risks that investors face in electricity generation (Gross et al., 2010).

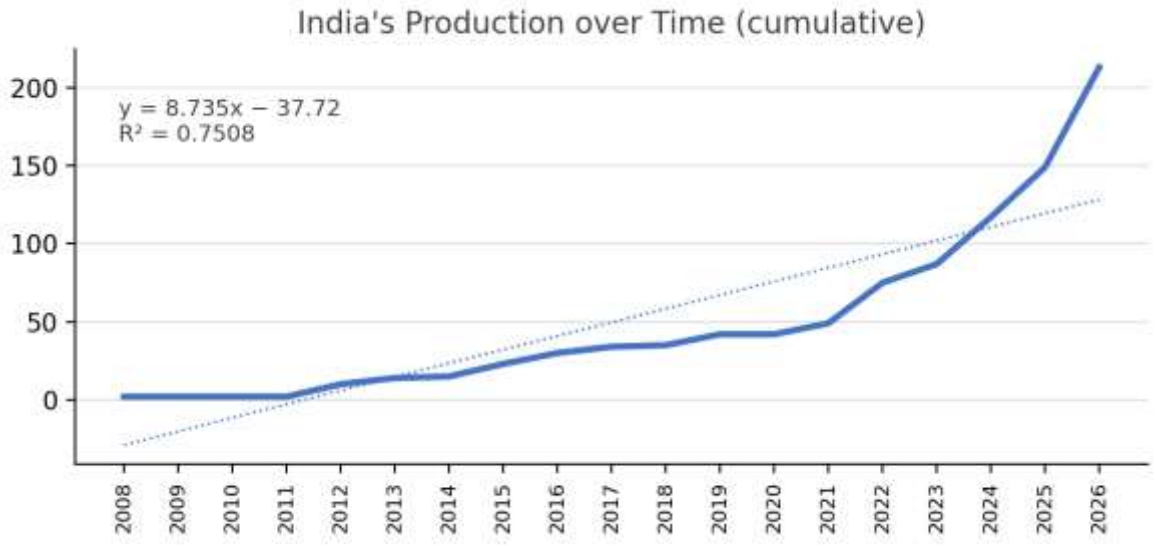


Figure 10. Cumulative publication output of India.

India's trend line, y = 8.735x − 37.72, has the smallest slope of the five countries and a moderate R^2 value (0.7508). India's output was almost flat until 2011 (2 publications) and then rose to 10 in 2012. Another rise took place after 2021, from 49 to 75 in 2022, and the total reached 213 by 2026 compared with about 128 predicted by the line. In 2026, India also moved ahead of Australia (213 compared with 202). Indian research includes studies of stock market participation and mutual fund investment (Sivaramakrishnan et al., 2017; Mishra et al., 2023).

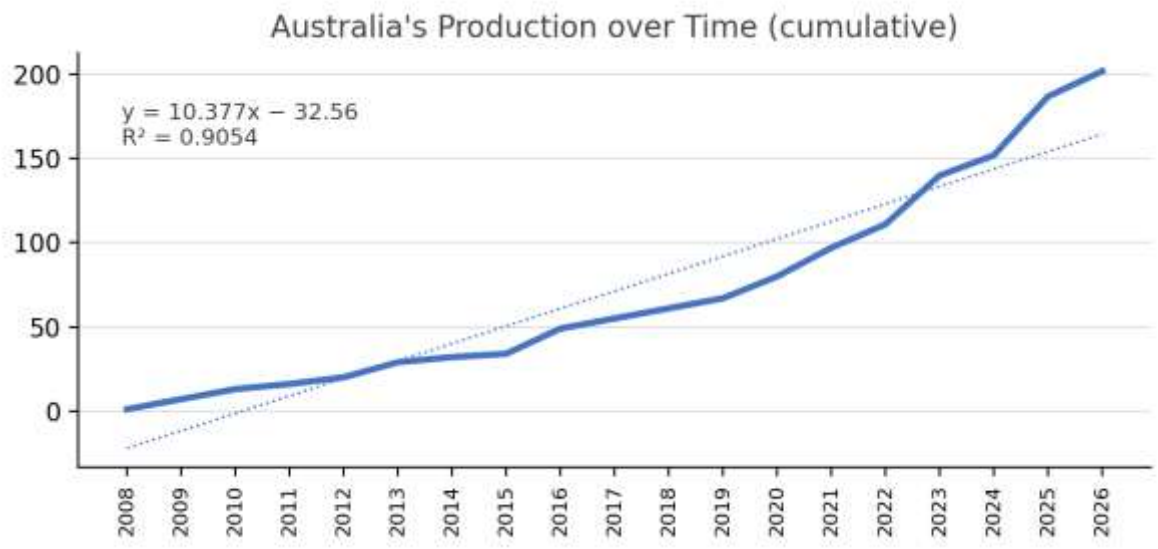


Figure 11. Cumulative publication output of Australia.

Australia's trend line, y = 10.377x − 32.56, has a slope of about 10 publications per year and a strong fit ($R^2 = 0.9054$). Its output grew gradually from 1 in 2008 to 202 by 2026, again above the 165 predicted by the line. Australian work includes research on household choices in the energy market (Agnew & Dargusch, 2017).

Taken together, these charts show that all five countries follow a rising pattern. The USA and the United Kingdom grew more steadily over a long period (R^2 above 0.93), whereas China and India, with lower R^2 values, show the most recent and fastest growth.

5.7 Thematic Evolution

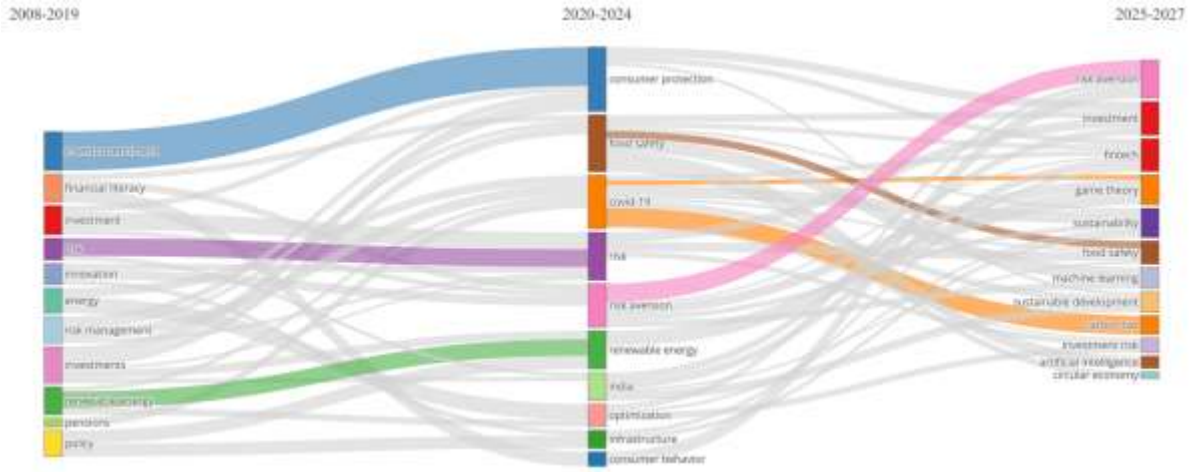


Figure 12. Thematic evolution of research across three periods (2008–2019, 2020–2024 and 2025–2027).

The Thematic Evolution chart shows how the main research themes have changed across three periods: 2008–2019, 2020–2024 and 2025–2027. Two cutting points were used to create these periods, and the first cut point coincides with the start of the COVID-19 pandemic. The size of each box shows how important a theme was in that period, while the thickness of each flow shows how strongly a theme in one period is connected to a theme in the next.

In the first period (2008–2019), the field was organised around themes such as investor sentiment, financial literacy, investment, risk, risk management and renewable energy. Early studies looked at how investor sentiment relates to stock returns and at how financial literacy shapes investment choices (Sayim & Rahman, 2015; Agarwal et al., 2015; Sivaramakrishnan et al., 2017). One of the thickest flows in the chart runs from investor sentiment to consumer protection in the second period. This may suggest that attention moved from how investors feel to how consumers are protected, for example through privacy and disclosure rules (Wong et al., 2023). The themes risk and renewable energy continue into the second period under the same name.

In the second period (2020–2024), consumer protection became the largest theme, and new themes such as COVID-19, food safety, risk aversion and optimization appeared. The COVID-19 theme is closely linked to research on changes in financial risk tolerance during the pandemic (Heo et al., 2021). Its flows then lead into carbon tax and game theory in the third period, which is consistent with models of carbon policy and technology investment under uncertainty (Fan et al., 2023). The risk aversion theme continues strongly into the third period, and food safety also continues from the second into the third period (Naseem & Rizwan, 2025).

In the third period (2025–2027), the themes include risk aversion, investment, fintech, game theory, sustainability, machine learning and artificial intelligence. This indicates a shift from general studies of risk and investor behaviour towards technology and sustainability. Recent work examines fintech adoption, the use of AI in personal investing and the biases of AI tools such as ChatGPT (Aftab et al., 2025; Atwal & Bryson, 2021; Chen et al., 2025). At the same time, themes such as sustainable development and circular economy show the growing link between investment risk and sustainability (Rabbani et al., 2025).

5.8 Time Slice

5.8.1 2008–2019 Time Slice

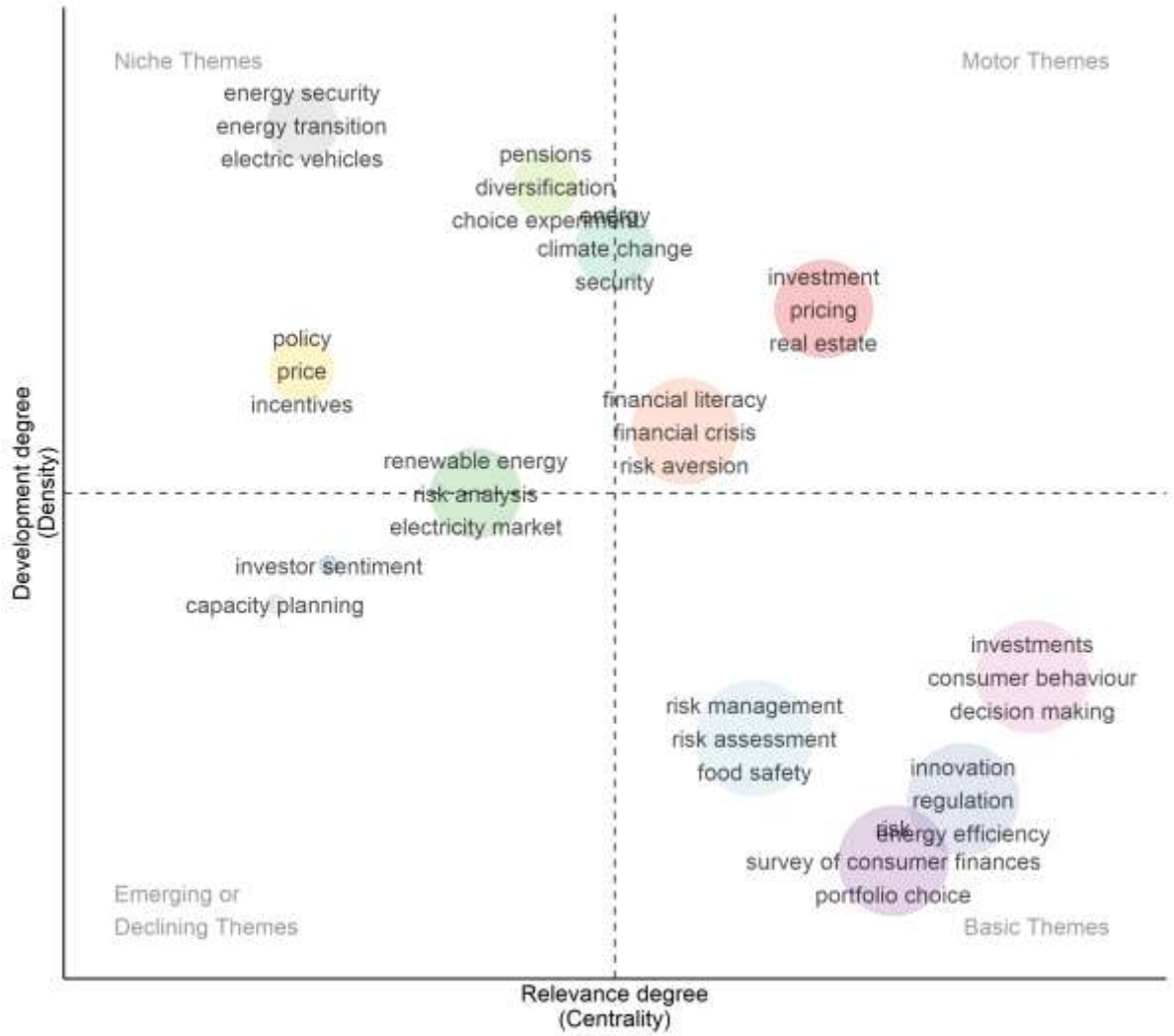


Figure 13. Thematic map (Time Slice: 2008–2019).

In this early period, the motor themes were investment, pricing and real estate, and the theme that links financial literacy, financial crisis and risk aversion. This means that both were central to the field and well developed. Among the largest basic themes were risk, the Survey of Consumer Finances and portfolio choice, followed by investments, consumer behaviour and decision making. These themes were central to the field but not yet well developed internally (Yao et al., 2011; Gilliam et al., 2010). Energy themes such as energy security, energy transition and electric vehicles were well

developed but isolated from the main topic, so they appear as niche themes. Investor sentiment appeared as a small theme in the emerging or declining quadrant.

5.8.2 2020–2024 Time Slice

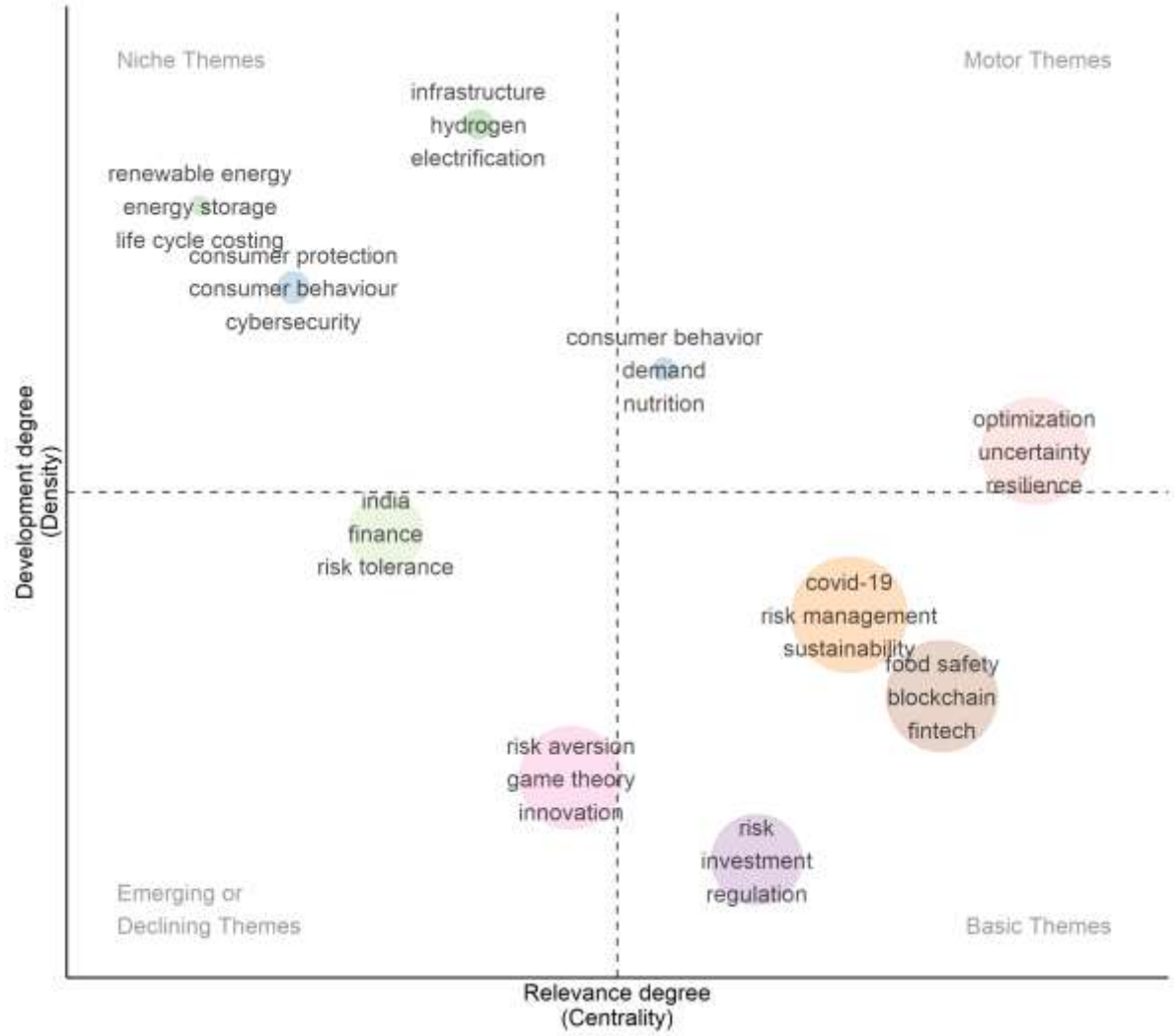


Figure 14. Thematic map (Time Slice: 2020–2024).

This period shows a clear change in direction. Optimization, uncertainty and resilience became a motor theme, which suggests that the field turned towards decision-making under uncertain conditions. COVID-19, risk management and sustainability, together with food safety, blockchain and fintech, were basic themes: central but less developed. Consumer protection, consumer behaviour and cybersecurity formed a small niche theme, and the energy themes (renewable energy, energy storage, hydrogen and infrastructure) also remained niche. Risk aversion, game theory and innovation, together with India, finance and risk tolerance, fell in the emerging or declining quadrant.

5.8.3 2025–2027 Time Slice

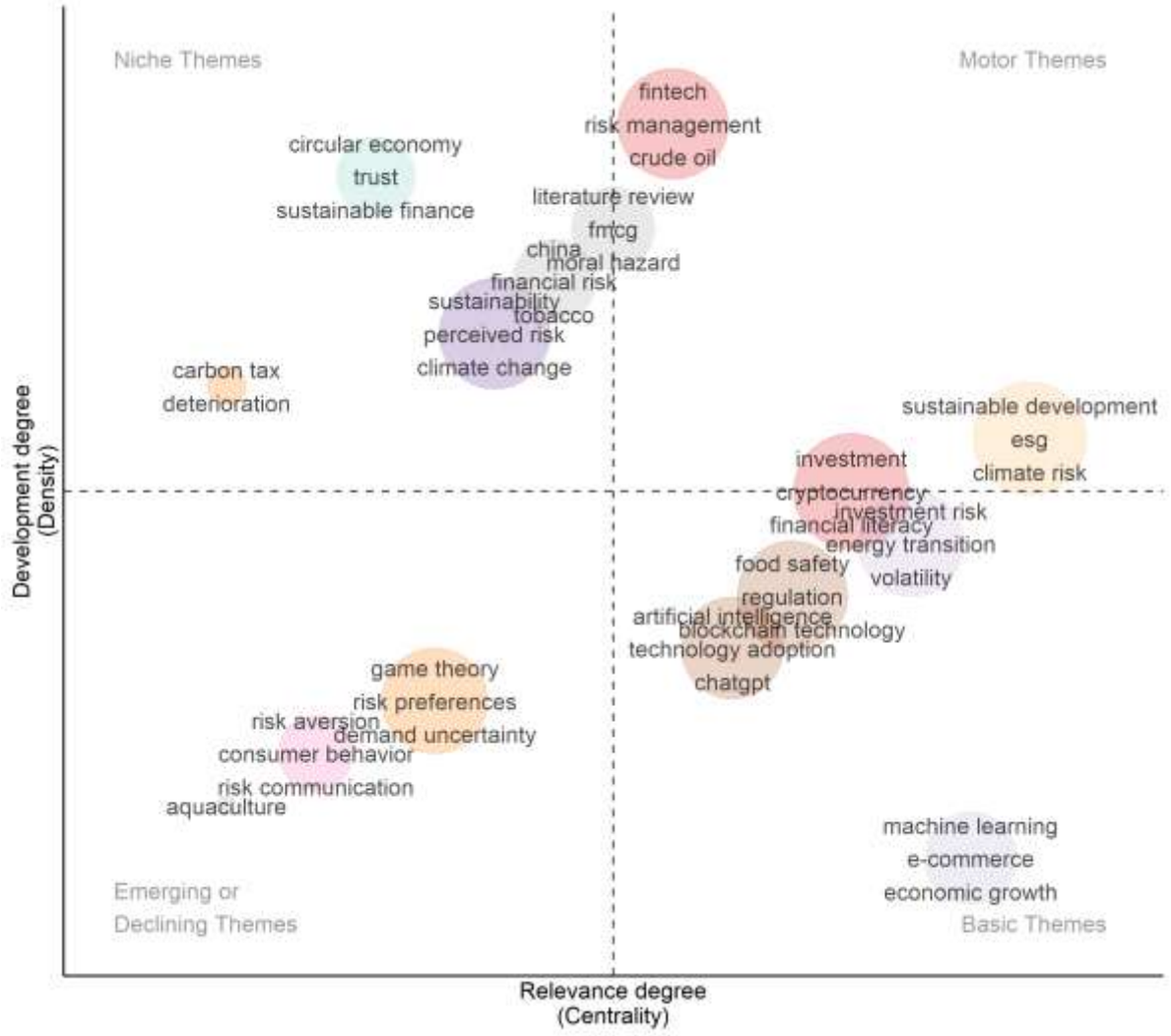


Figure 15. Thematic map (Time Slice: 2025–2027).

In the most recent period, fintech, risk management and crude oil formed the main motor theme, and sustainable development, ESG and climate risk also sat in the motor quadrant. The theme combining investment, cryptocurrency and financial literacy lies on the border between motor and basic themes (Hayashi & Routh, 2025). Artificial intelligence, technology adoption and ChatGPT, machine learning and e-commerce, and food safety and regulation are basic themes, which shows that these topics are central but still developing. Circular economy, trust and sustainable finance, and carbon tax appear as niche themes. Game theory and risk preferences, and risk aversion and consumer behavior fall in the emerging or declining quadrant. Because risk aversion showed a strong flow in Figure 12, the maps alone cannot show whether these themes are declining or re-emerging.

6. Conclusion

6.1 Briefing on the study

This bibliometric study was aimed at creating an overview of consumer risk research in investment decision-making process. Four research questions had been established, which included development of the field, geographical distribution, sources, and keywords used; changes in the thematic scope, as well as identification of existing gaps. The data had been collected via Scopus search engine on 17 September 2026 using the following keywords: consumer, investment and risk. After filtering the results in regard to the time period, type of documents, language and sources, the data had been analysed using R with Bibliometrix and Biblioshiny packages. The total number of sources had been 1,009, while the period of publication ranged from 2008 to 2027.

As for now, the authors seem to be successful in accomplishing their research goals. The analysis provided the authors with information regarding publication dynamics, geographical distribution, concentration of sources and thematic evolution. Moreover, it has been identified that the field has transformed from issues of risk tolerance and financial literacy of consumers to topics such as technology, sustainability and regulations. Meanwhile, it should be mentioned that heterogeneity of the dataset is one of the limitations discussed below. (Kumar & Ranjani, 2025)

6.2 Major results of the study

As per the first research question, there was consistent growth over time. The output nearly increased eight times from 2008 till 2025 across three different periods. In the first period, from 2008 till 2018, the field remained modest making up for about 31% of the database. Then, it kept steady until 2021, and thereafter, it increased sharply such that the last three years make up about 36% of the entire database. The negative growth rate of 12.8% reported by Biblioshiny is an artifact of the 2027 end date that consists of two early access papers. By the year 2026, the output increases at around 12% yearly, and 2026 is still an incomplete number since data collection was done in September.

The studies in this field are also collaborative but mostly national. There are 4,984 authors involved in total, only 268 authors have written single-authored articles, and there are 3.32 authors per document on average. 26.63% of the documents consist of authors who come from different countries. On average, the document age is 5.72 years, and there are 5,645 unique author keywords indicating the broad nature of the topic. Regarding the second research question, it was established that there is a globally distributed field. The US is ahead of China, the UK, India, and Australia. While the US and the UK have shown stable growth in the publication of literature with perfect trend lines, China and India are the ones with the most recent rapid growth. In 2023, China surpassed the United Kingdom while in 2026 India surpassed Australia. There are no dominant journals in the field. Sustainability, Energy Economics, and Energy Policy rank first in the field, with top ten sources accounting for just 11% of the documents. Additionally, 75% of the 1,009 sources in the field publish one document. The keywords which include investment, risk assessment and risk management confirm that the heart of the field lies in the management of risk during investments. (Yao et al., 2011)

The last research question revealed the thematic shift in the field clearly. From 2008 to 2019, the field focused on investor sentiment, financial literacy, investment, and risk, with risk, portfolio choice, and consumer behaviour being underexplored fundamental themes. From 2020 to 2024, consumer protection becomes the most prominent theme, COVID-19 and risk aversion emerge, and optimization, uncertainty, and resilience become motor themes. From 2025 to 2027, FinTech, risk management, sustainable development, ESG, and climate risk are placed in the motor quadrant, whereas artificial intelligence, ChatGPT, and machine learning become fundamental themes, and trust and sustainable finance become niche themes. (Kim & Fan, 2025; Tahvildaria, 2025)

Research question four revealed the areas which require further attention. The consumer level perspective on risk, the portfolio and model perspective, and the technology and regulation perspective remain separated. AI governance, trust, cryptocurrency, sustainability claims, and cross-country differences need to be addressed through integration. The map cannot determine the direction of risk aversion either – its flow is pronounced in one chart and is placed in the emerging or declining quadrant in others. (Balaskas, 2026)

6.3 Implications of the findings

6.3.1 Implications for academics

In this paper, researchers get a structure of an unstructured domain. Namely, it reveals that the problem of consumer risk in investment has turned out to be a set of interconnected streams such as behavioural finance, FinTech, AI and ESG; however, there are few connections between them. Moreover, bibliometrics can analyse a subject area that is too vast for traditional approaches, but it largely depends on the selection of keywords and preprocessing of data. The dominance of energy and sustainability journals reminds of the need to take into account the vastness of the subject matter covered by searches on risk and investment in future bibliometrics.

6.3.2 Managerial implications

In terms of bank, asset manager and FinTech firm strategies, moving into a technological realm means that the consumer risk is linked both with advice given and product provided. From the reviewed literature, adoption is related to trust, data security, perceived risk and user-friendliness. As a result, managers need to develop robo advisors and investment

apps that are transparent, explainable and appropriate for risk averse and budget constrained customers. Financially literate people, along with their perception of risks, should be taken into account while creating new products, and both ESG and cryptocurrency products should highlight their risks because overconfidence and biases may drive customers to or from these products. (Atwal & Bryson, 2021; Kumar & Ranjani, 2025)

6.3.3 Social implications

Financial literacy and risk aversion affect which people will have access to new investment opportunities and which people will be at risk. Groups of people who need to be protected, such as elderly people who are more likely to fall for scams, should be educated. FinTech products provide wider access to savings and investments, especially in such regions as Southeast Asia and India, however, not all consumers will receive these benefits due to lack of digital literacy and trust issues. (Hayashi & Routh, 2025)

6.3.4 Policy implications

Regulators must cope with quickly changing products. Scholars emphasize the regulatory dangers of automated investment advice provided on a large scale, and the increased use of AI poses additional concerns regarding bias, explainability, and accountability. It is argued that policy makers should think about the necessity to have clear policies in relation to robo advice and AI technologies, the need for consumer protection in the case of volatile assets such as cryptocurrency, and the standards for sustainable claims. It is essential to address privacy and disclosure regulations because data protection regulation is now seen as a business risk in technology company filings (Baker & Dellaert, 2018)

6.4 Limitations and future research recommendations

There are many limitations of the current study. Firstly, time was a limiting factor because the initial set of articles could not be read individually and therefore was filtered automatically and consequently some relevant articles might have been left out. Secondly, the information was obtained from one database only. Scopus was selected due to its comprehensiveness and metadata; however, other databases like Web of Science could provide additional studies and alter rankings of countries and journals. Thirdly, only articles in English were considered, which can be a limitation as well.

Fourth, the sample is heterogeneous. Many articles on topics that have little to do with consumer finance core have been found with the help of the keyword search; the indexing terms like human and article are meaningless for the research purposes. It makes it more difficult to distinguish the consumer finance core from the rest of the findings. Fifth, no cited references have been exported from Scopus, which means that no co citation analysis could be conducted, and the description of the intellectual structure is based on the keyword search and publication statistics. Sixth, data collection was conducted in September 2026, which means that the data for 2026 are incomplete and that there are only two records for 2027 that are early access papers. Seventh, the authors of the paper are inexperienced students who are new to the software.

These aspects may be studied in different ways for future researchers. First, Scopus may be complemented by Web of Science, and cited references should be included to conduct co-citation and bibliographic coupling analysis. Secondly, the researchers may restrict the data to consumer finance and behavioural finance topics, or even use abstracts to distinguish the field from other related domains. It is also important to conduct a content analysis or systematic review of the most cited and recent articles. In addition, the empirical research on AI advisors and chatbots, cryptocurrency, ESG and green investments, and trust in digital platforms is required. Comparative research between countries is important too, especially the ones between the United States, China, and India in order to understand how culture, regulations, and markets influence the risk of consumers. It is also possible to repeat the research in 2026. (Aftab et al., 2025; Hayashi & Routh, 2025)

6.5 Future Research Agenda

The present research aims at providing an overview of the evolution in research in this field, namely Consumer Risk in Investment Decision-Making: A Bibliometric Review. The results indicate that consumer risk in investment decisions is a wide ranging concept that is affected by financial knowledge, attitudes of individual investors, risk perception, investment options and technology and the fluctuations of the market.

The analysis also shows an increasing number of research publications in recent years as well as the emergence of new areas of research such as FinTech, artificial intelligence (AI), machine learning, sustainability and environmental, social and governance (ESG) investing. The literature to date offers interesting information on these topics; however, there are a number of avenues for further research to better understand consumer perceptions and reactions to risk in the decision-making process on investments.

6.5.1 Bringing Consumer Behaviour and Financial Risk Together

A major future research stream is to further explore the link between consumers' behaviour and their financial risk. The existing literature has been dedicated to the concepts of risk tolerance, risk aversion, financial literacy, and psychological biases/investor feelings. But these factors don't always apply to all investors. Personal experiences, knowledge and attitudes to uncertainty can lead two people with the same income and investment opportunities to make very different decisions. The interaction between these factors could be studied in the future rather than the individual factors. Researchers could determine, for instance, if financial literacy is linked to greater knowledge of making better investing choices when investors are experiencing fear, uncertainty or pressure due to market changes, or if investors with higher financial literacy are more adept at identifying those who are not the ideal investor, or if they are less likely to make investment decisions in the short term. The research can be done with retail investors, salaried people and young professionals and the first time investors. Information can be gathered using financial literacy surveys and interview about their financial literacy and attitude towards risk and investment. These factors and the actual investment decisions then may be correlated statistically. This hit would be informative not only on what influences the investment decision, but also on the ability of different group of consumers to be affected by the same financial risks. It can also be used as a tool for financial service providers to design and implement improved financial education programmes and provide improved financial instruments to different consumers.

6.5.2 Understanding the Growing Role of Technology in Investment Decisions

As technology becomes part of the investment decision-making process, it is becoming an important future research area as it influences consumers' choices. The bibliometric analysis shows that topics of recent years relate to FinTech, Artificial intelligence and Machine learning, as well as Digital investment services. These changes have impacted people's access to financial information, their ability to compare financial services and products and to get financial products advice.

It can be made more accessible by investing through a digital platform and automated advisory services, especially for those who may not be able to access professional financial information easily. However, they can also trigger privacy concerns, misinformation and algorithmic bias, and consumer confusion regarding recommendations. Discuss explainability and user trust and human oversight in the context of AI in financial advice, as aforementioned by Tahvildaria (2025).

Future studies could investigate how much faith people have in investment advice from an automated platform as opposed to a human financial adviser. It could also look at whether investors are aware of the risks of AI-driven advice or whether they make investment decisions based on AI advice without conducting their own due diligence. What's also interesting is if and how consumers respond to the information being communicated when the risk information is shared in an investment application, such as choosing a more or less secure product.

6.5.3 Studying How Investment Risk Perception Changes Over Time

The bibliometric analysis can identify the changes in the publication pattern during different periods, for example, the increase in research activities after 2021. It also underscores the shift in the traditional topics, such as risk, to financial literacy and investor behaviour, to technology, sustainability and new investment topics. The question that comes to mind is then what do consumers' attitudes towards investment risk change over time? Future studies should investigate how big events such as economic uncertainty, financial market declines, technological progress or public health-related crises impact investment decisions. For instance, one could find out if those losing money become more cautious or if some are more adventurous in order to compensate for their losses. Studies in the future, however, could follow individuals over a number of months or years instead of collecting information at one time. They might be collected at different sections of their investment preferences, financial confidence, risk tolerance and investment decision. This would help to show if they're a reaction to a market event, or if they're a lasting change in behaviour. The time period of three to five years might be considered for a longitudinal study, depending on the question(s) being addressed and

resources available. Other factors to consider when conducting research are that the investment products, regulations and markets can change throughout the study process. The outcomes of these analyses can provide consumers with insights into their learning from their financial experiences, and whether they're being consistent with their stated risk-taking preferences. It also would provide a roadmap for financial advisers to when a consumer may need more advice during a period of economic storminess.

6.5.4 Exploring New Investment Products, Sustainability and Consumer Trust

The results also indicate increased interest in sustainable finance, ESG investing, and cryptocurrency investment products and technology. Future research is possible in these areas, and consumers may make different assessments of risks when investing in different types of investments.

For instance, a consumer might have an idea of the potential earnings of an investment but not be sure that the investment will be lasting, that it will be regulated, or that the information about it will be accurate. In the same way, investors could be drawn to cryptocurrency due to its potential development, but they might not be aware of the high volatility of its value and the threats of losses.

Future research might focus on consumer comparisons of traditional investments, including shares and mutual funds, with new investments like cryptocurrencies and sustainable investment products. They might also examine how trust in a financial institution, investment platform or a sustainability claim relates to investing decisions.

Studies on green FinTech adoption, such as Balaskas (2026), confirm that the importance of trust is related to FinTech adoption, but also reveal that this link can be different depending on the context and the measure of trust. Future research could further differentiate trust of the financial service provider, technology, and claims associated with the investment.

Surveys and controlled experiments could be used to study how consumers react to different types of risk disclosure and information about investments. Comparisons may also be made between first-time investors and experienced investors to see if experience impacts how well they are able to recognize potential risks.

The work may enable financial institutions to convey investment risks more effectively, and help consumers make decisions on the basis of an improved understanding of the products they are investing in.

6.5.5 Expanding the Scope and Methodology of Bibliometric Research

The present study is based on the Scopus as the main database and aims at English language journal articles and reviews. These options present a pre-structured and manageable set of records, but may overlook research data found in other databases, in other languages or in other media. Interdisciplinary nature of the topic is also shown by the fact that the analysis revealed that it relies on a rather large set of sources.

A bibliometric analysis might then be possible to be further complemented in the future by including other academic databases, like Web of Science, and others, for more suitable analysis. The researchers were able to cross-reference the results from the various databases to find other publications, authors, journals and research topics. Studies published in other languages where reliable translation and screening can be performed should also be included to give a wider international perspective.

Another enhancement is to update the data with regular intervals. Given that there has been an uptick in publications in recent years, and that the emergence of new topics like AI-powered investing and digital consumer protection and ESG risk may be in the process of gaining traction, a review every two or three years may be useful. The date of data collection must be declared in the research work and care should be taken with incomplete publication years.

Further research could also employ other review techniques, such as systematic literature review or close reading and critical analysis of specific research papers. Bibliometric analysis can be helpful for charting publication trends, important publications, and the relationships between the keywords, but cannot on its own fully account for the results of any individual study or its quality. An analysis of the theories, methods and consumer experiences that underlie the observed pattern could be gained by a more detailed consideration of some of the papers selected for the bibliometric mapping.

Furthermore, future researchers should make sure that the exported data set contains all the cited-reference data when analyzing it, including co-citation analysis. The methodological enhancements would enable future reviews to be more extensive and facilitate more reliable comparisons of progress in the field.

6.5.6 Addressing the Research Gap and Building Existing Knowledge

Though there have been numerous studies on the topic of consumer investment behaviour and financial risk, the existing studies reviewed in the present study show that research on these areas has been conducted from a single perspective. Some investigations are centred on psychological biases and on the individual risk tolerance, others on portfolio optimisation, financial technology, consumer protection or sustainability. Much work has been done in each of these areas that has deepened our knowledge of the issues, but it is important to understand the interrelationships between these areas and between other areas and the overall investment decision making process. These factors can be incorporated in possible future research by understanding the characteristics of consumers and their link with investment products, digital platforms, financial advice and regulations. As an instance, a study could be conducted on the relationship between financial literacy and trust in an investment platform and financial risk-taking behavior. They can also explore if the outcome of the advice delivered by AI is influenced by an investor's background or risk profile. The literature review would help in getting a sense of the literature available to the theme identified and then conducting an empirical study to test the identified relationships. The first stage can be used to track the progress of the research; the second stage can gather consumer data and understand the consumer's experience and decision making. The aim of identifying this gap is not to imply that the risk of consumers in investment decision making has not been given much attention as a whole. Rather, it is to recognise that the present study is fragmented and is focussed upon different areas and niches that needs to be investigated for integration of these. The more integrated approach could broaden the existing knowledge and offer a better understanding of how consumers perceive, assess and react to investment risk.

6.6 Concluding Remarks

Overall, future studies on consumer risk in investment decisions should consider and integrate the following elements: (1) linking the consumer's behaviour to financial risk; (2) focusing on the emerging role of technology; (3) making cross-national and cross-demographic comparisons; and (4) gaining insight into the temporal dimension of risk perception. The conclusions of the present investigation give a starting point of these investigations. The broader datasets, more clear research timeframes, more suitable empirical methods and more interdisciplinary research can be used by future researchers to build upon and fill gaps in the existing knowledge. These strategies can contribute to the understanding of the investment risks and enhance the dissemination of these risks to academia and to financial institutions, policy makers or consumers.

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