Mapping the Landscape of Investor Psychology: A Bibliometric Analysis of Key Psychological Bias

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Abstract
Purpose- exploration of investor's psychology is a prolific among researchers. Despite of the existing studies on the investor's psychology and their decisions, the gaps still exists in understanding how investor's behaviour stimulates these decisions. This research paper aims to map the trends of research through trends of publication of overconfidence and herding behaviour of retail investor. Secondly, this research aims to categorise existing and emerging themes of research. Finally, this research will suggest avenues of research on investor's behaviour affected with herding and overconfidence through signifying the gaps in the existing research.

Design- the study has utilises bibliometric analysis to identify the research gaps. Furthermore, biblioshny tool is employed to check the trends of publication, countries, regions, affiliations, journal quality, citations, author influence, high frequency words, and thematic mapping. Another tool vosviewer is used for bibliographic coupling, and geographical. To felicitate the research data was collected through scopus database, spanning from 1992 to 2024, it encompasses 122 research papers.

Findings- the study reports an upward trend in the research publication on mapping investor's psychological bias. Furthermore, the research acknowledges the emerging trends due to evolution of fintech.

Keywords: Overconfidence, herding, bibliometric analysis, investor's psychology

Introduction-
Investor's decision making is subject to the behavioural biases. Though, several studies are there still it is relevant among researchers. An investor knows that high returns will lead him towards high risk as well. Still, due the efficacy of biases he commits the investment mistakes (jain, walia, kaur, et al., 2021). Traditional theories of finance postulate investors are rational and the trade-off between risk and return that maximise the profitability (bakar & yi, 2016; e. Fama, 1970). Rational behaviour of investor is the foundation of traditional finance. Capital asset pricing model claims if investor behaves rationally, he/she may receive the higher returns by accepting the higher risk on securities he is currently holding (sharpe, 1964).

Kahneman, knetsch and thaler contradicts, if investor are rational, and they have well defined preferences and choices so stock market anomalies must not exist (kahneman et al., 1991). Several evidences of irrational behaviour of the investor has been witnessed (rehman et al., 2017). Psychology of individuals affects their decisions on a great extent and effects the on investment decisions (virlics, 2013). The learning theories in psychology suggest that decision making is a complex process. It is the application of human behaviour that if the repercussion of external environment, heuristics, bias and emotions. In economic and financial theories assumes investor

behave rationally. Controlled behaviour is possible in the laboratory experiments. But in the case of natural environment the conflict will arise as the subject is not programmed to take a specific action. Herbert a. Simon further concludes that usefulness of economic theory assuming rational behaviour is doubtful. An alternative can be considering theories of cognition and perception while preparing these theories (simon, 1956).

In her work on efficient market hypotheses (e. F. Fama, 1970) stated market efficiency is the informational efficiency of the market. Furthermore, with the spread of information the prices start fluctuating. (singal, 2006) stated that market efficiency is necessary; an inefficient market leads to market anomalies. Market inefficiency creates speculative bubbles in the market. The dot-com during 1995-2000 investors with a hope of bright future made speculative investment in internet based companies. Stocks were overvalued and by 1999 when such companies started collapsing due to lack of business and in 2000 the bubble got burst.

Behavioural finance has been the prime interest of researchers from several years (corzo et al., 2014). It helps to study the process of individual's decision making. It has made clear that retail investors and investment advisors as well get affected to the behavioural biases (jain, walia, singh, et al., 2021).

Statman (2014) stated that behavioural finance is not merely a subject it is a collection of story. Moreover, it gives the information of "why investors take a specific decision"? From a long time standard finance and behavioural finance debate whether investors are rational or irrational. Statman further says, that investor is neither rational nor irrational. They behave normal. Furthermore, an investor doesn't have a distinct mind-set while taking investment decisions. Making errors is human nature (statman, 2014).

Although a rational behaviour refers to a logics in individual's actions but decisions related to investment are based on the expectations of return. An investor takes decisions on the basis of his past experiences and availability of information. The rationality is a missing element in the investment decisions. From the investor's point of view he has taken a rational decision according to available information (stålnacke, 2019). Sources of information of information for the household are internet, print media and the personal contact (shin et al., 2020). The reaction of investor on different market conditions is different. While normal market investor overreacts on the market information this overconfidence leads the market volatility. On the other hand, investor avoid the information while market crash (mushinada, 2020). Waiting for the market reaction, preparing the investment strategies according to the investment strategies of others is the common behaviour of investors (cao & wang, 2021). Same behaviour is also noticed while investor is trying a new financial product with which they are not much familiar such as crypto currency (omane-adjepong et al., 2021). The tendency of taking biased decisions destabilise the financial market (sachdeva et al., 2021).

Biased investment decisions are the result of availability of contradictory information. On the basis of investor's characteristics education and investment experience are also found responsible of biased behaviour (ng et al., 2022).

There are several behavioural biases exists in human psychology. Such biases affect the decision making even in investment decisions as well. In this study we are concentrating retail investors and their impact on investor's decisions. We have attempted to employ the bibliometric analysis, and content analysis. This research makes an effort to achieve the objectives below-

Objectives of the study-
- To explore the trends in research of behavioural biases with the help publication trends.
- To categorise the upcoming themes in the area of behavioural biases.
- To identify the future direction of research.

Research methodology
The existing study uses the a systematic approach proposed by singh & walia, (2022) and jain et al., (2021) to ensure the coverage of the objectives and literature. An organised review assists in mapping the potential research gap (pessin et al., 2022). The authors have discussed the methodology in sub-sessions below-

Literature retrieval and selection
Search strategy- the study has used electronic database to explore the relevant studies. One of the most popular data base among researchers i.e. Scopus has been used. Scopus database provides a wide range of academic resources and bibliometric database. Following criteria has been used to finalise the research papers-
1) The search was concentrated on the identified keywords only.
2) Research papers that are published in english language were considered.
3) Journals, research papers were scrutinized to get the research papers of our interest. It was also attempted to make sure relevant research papers must not be ignored (eduardsen, j., & marinova, 2020; jain, walia, singh, et al., 2021).
4)
While collecting the key words suggestions and guidance from the previous researchers has been implemented (c. S. Chen et al., 2017; singh & walia, 2022). To minimise the chances of omission several keywords words has been identified and used- "behavioural finance", "behavioural bias", "financial literacy", "herding", "retail investor", "indian stock market", "overconfidence", "disposition effect", "framing", "mental accounting", "sensation seeking", "investor sentiment", "cognitive bias", "mutual fund", "investor's decision", "investment", "sentiment", "irrational behaviour", "risk aversion", "self-attribution bias", "bounded rationality".
Total 1570 research records were retrieved initially. Further, using several filters research articles suitable for the analysis were selected for the study.

Selection of study-
To ensure the relevant studies the study has established few standards. First, studies will consider only peer reviewed articles. Secondly, only the studies in the area of behavioural finance are considered. Third, the study only incorporates the research articles in english language. After applying the above standards 1570 results were recovered. Further, to find the relevant studies the first step was preliminary screening title, keywords and abstract of the documents. In the second step, documents went through deep screening process article was scrutinized by complete reading. Out of 1570 total 274 published during 2003-2024 were selected for further analysis.

Data analysis method
The study has applied bibliometric analysis on the selected research articles. The bibliometric analysis involves several techniques to classify the authors, journals and research studies. This research has used open source software namely- r package 4.3.3, biblioshiny and vos viewer. R package 4.3.3 was used to activate the biblioshiny to further make the tabulation and network from the raw data. Vos viewer was used for the network analysis.

Data analysis: The section of data analysis is divided in three separate sections according to the research objectives. The first section of the trend analysis covers the frequency of research publication. Second section of thematic analysis showcase the theme of published research articles. The third section, content analysis covers the subthemes on the investor's bias.

Result objective 1

Trend analysis: The study of trend analysis includes chronological trends of publications, journal quality analysis and geographical span, citation network, and page rank analysis.

1)   Chronological publication trends- fig.1showcases the annual publication of the research studies on investor's bias. The study covers the timeline from year 2003 to 2024. Although, significant researches were conducted on investor's bias before 2003 as well. But the number was negligible. However, a rapid growth has been seen in the research publication from 2011. In the fig.1 although there is a steep downfall in the publications. But it is due to data collected in the initial months of 2024.

Figure 1 publishing trends in the area of investor's bias
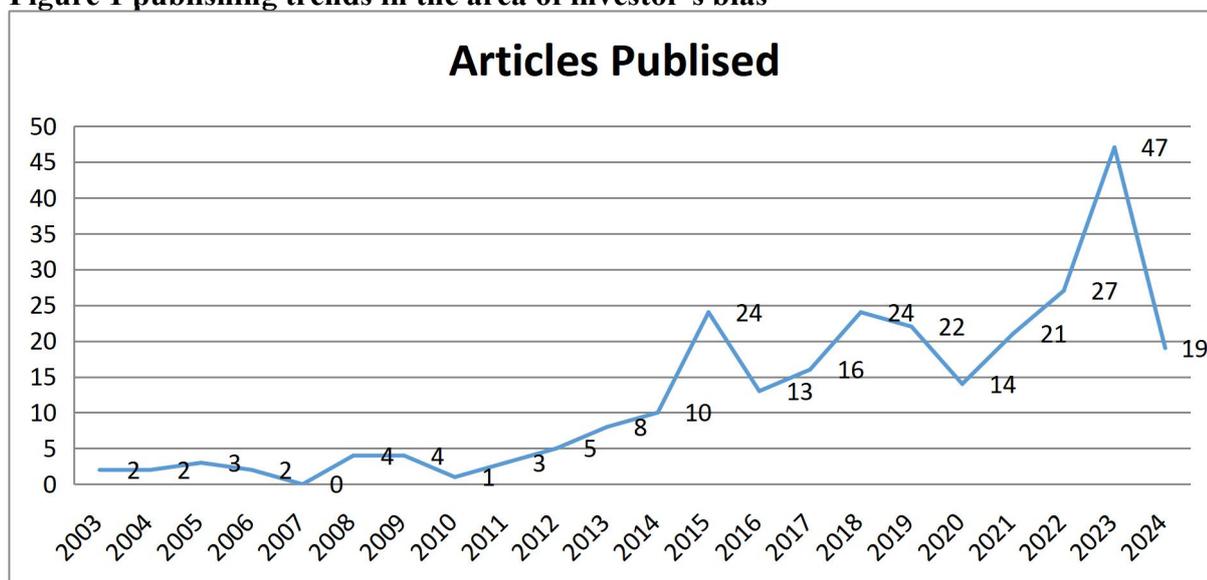
2)   Journal quality analysis- this analysis involve several factors that determine the quality of the journal in the specific fields. Key considerations include indexing, number of articles published, and the average number of citations received over the period of them. The initial analysis with the help of biblioshiny reveals total 87 different journals publishing literature on investor's bias. Table-1 depicts the top 10 journals contributing to investor's bias. However, journal of behavioural finance has highest number of published articles. But, the articles published in "qualitative research in financial market" Were cited most. "journal of behavioural finance" And "journal of behavioural and experimental finance" Have highest ranking in h index that is 8. Pacific basin finance journal, international review of financial analysis, and european journal of finance are among other influential journals.

Citation analysis is technique is used to prove the influence of the research. It evaluates the popularity of a research paper. Citations of a research publication show the popularity of the research and its impact. Table 3 shows the top 10 journals their articles related to the topic. Citations are affected by the time duration of the research work published. An old research paper may have higher citations in comparison of the recent one. This is one of major limitation of the

citation analysis. Although, the journals that have made the significant impact in the research of investor's bias are journal of finance, journal of financial economics, the journal of finance, american economic review, review of financial studies and so on so forth listed in table 4. Figure 3 demonstrate the citation network among top journals. In connection with table 2 review of behavioural finance has been cited by the most of the authors that have published in other journals. Journal of finance is also one of the reputed journal and its citations are respectfully considered in other top journals.

Table 2 shows countries publishing on the investor psychology and impact of overconfidence, optimism and herding. Top countries for the research on above biases are manifold from usa, india, uk and china. It also shows the mcp (inter-country) and scp (intra-country) collaboration. Authors from usa collaborate with foreign authors less in comparison to the us authors. But the number of publishing researches with foreign authors and home country authors is still high in comparison to the other countries. Table 1 shows top ten countries contributing in the discussed topics. The top institutions contributing in topics are us, portugal, tunisia, india, spain indonesia and pakistan. Figure 2 demonstrates the contribution of several researchers geographically.

Further, the citation network presented in the figure 3 explains the connection between various reputed journals. Research articles published in several reputed journals are connected through citations. Citations are affected by the time duration of the research work published. An old research paper may have higher citations in comparison of the recent one. This is one of major limitation of the citation analysis. Although, the journals that have made the significant impact in the behavioural research are journal of finance, journal of financial economics, the journal of finance, american economic review, review of financial studies and so on so forth.

Table 1 top journal contributing to investor's bias

Sr.n	Sources	Articles	H index
1	Review of behavioral finance	30	8
2	Journal of economic behavior and organization	23	8
3	Journal of asian finance, economics and business	15	4
4	Journal of finance	14	6
5	Journal of financial economics	12	4
6	Review of financial studies	9	4
7	Global business review	8	3
8	Iiib management review	8	3
9	International journal of finance and economics	7	1
10	International journal of islamic and middle eastern finance and management	7	3

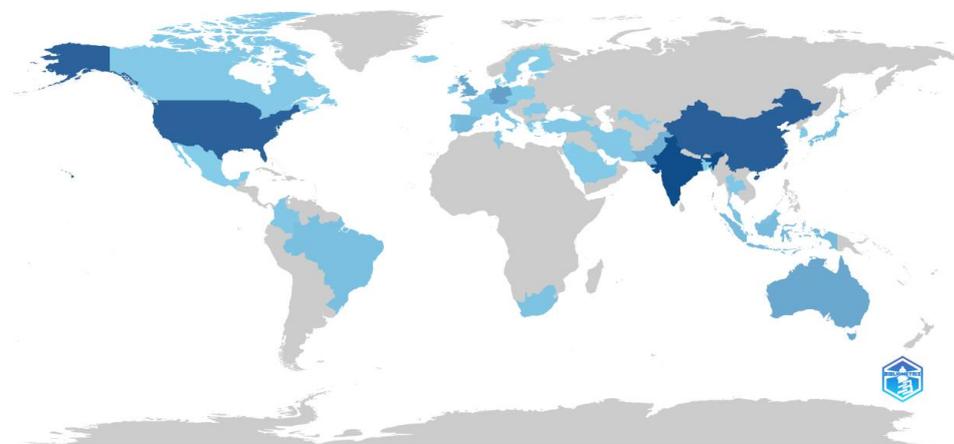**Figure 2 geographical span of publication on investor's bias**

Country Scientific Production

Table 2 contribution of countries

Sr.n	Country	Articles	Scp	Mcp
1	Usa	26	21	5
2	India	19	17	2
3	United kingdom	8	6	2
4	China	5	3	2
5	Indonesia	5	5	0
6	Germany	4	2	2
7	Greece	3	2	1
8	Brazil	2	2	0
9	Italy	2	1	1
10	Korea	2	2	0

Table 3 top 10 cited journals

Sources	Articles
Journal of finance	380
Journal of financial economics	208
The journal of finance	187
American economic review	119
Review of financial studies	114
Econometrica	76
Journal of banking and finance	76
Quarterly journal of economics	70
Journal of behavioral finance	68
Journal of political economy	65

Figure 3 citation network
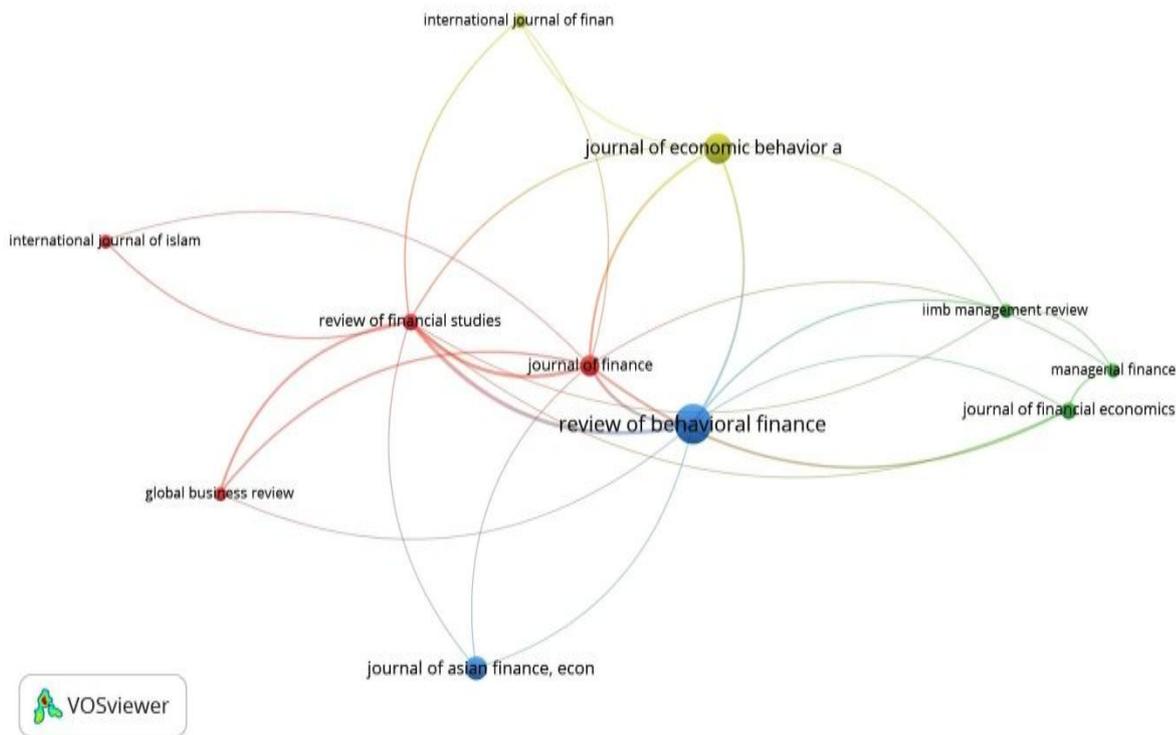
3)   Pagerank analysis- although citation analysis is a valuable tool but it exclusively concentrates on the popularity of the paper with the help of the citations received. There is a possibility a research paper is highly cited but not equally reputed. To address the limitations of citation analysis pagerank analysis is applied (jain et al., 2022; singh & walia, 2022). The research paper has used the equation suggested by singh & walia, (2022).

$$Pr(x) = \frac{(1-d)}{n} + d \left(\frac{pr(t_1)}{c(t_1)} + \dots + \frac{pr(t_n)}{c(t_n)} \right)$$

Where pr(x) is page rank of paper x, d is damping factor ranges from 0 to 1, t_1,
…, tn is a set of research papers that have cited paper x, $c(t_1)$, …, $c(t_n)$ represents
Citations of papers t_1, …, t_n.
Table 3 demonstrates the top 10 research papers based on the pageranking. This process ignores the prestige of the research paper but according to the impact. Contribution of kumar & goyal, (2016) and arora & kumari, (2015) are most impactful researches.

Table 4 top 10 papers by pagerank

Author (year)	Pagerank	Global citation	Tc per year
Kumar & goyal, (2016)	0.0121030	764	31.83
Arora & kumari, (2015)	0.008711	746	32.43
Statman et al., (2006)	0.007388	705	32.05
Daniel & hirshleifer, (2015)	0.007123	556	32.71
Frino a & g, (2015)	0.005867	551	17.77
Barber et al., (2009)	0.005841	541	30.06

Grinblatt & keloharju, (2009)	0.005860	401	23.59
Brown & cliff, (2005)	0.005718	391	17.77
Pompian, (2006)	0.005059	387	27.64
Jain et al., (2022)	0.004947	333	23.79

4) Bibliographic coupling-

Bibliographic coupling is a technique to the connecting between the citations of the research papers. It analyse that how the different research papers of various themes are interconnected to each other. Overconfidence, optimism and herding are separate psychological states of an investor but all of them are connected to each other from various threads.

Several colours in the figure 3 show several groups of bibliographic coupling. Red colour group comprises the work by kumar, a.(a. Kumar, 2020), ansari, a.(ansari & ansari, 2021), gabbori d;virk n;aftab n;awartani b (gabbori et al., 2022), chaffai m;medhioub i(chaffai & medhioub, 2018), sachdeva (sachdeva et al., 2021) etc. On herding. Green colour shows the group of overconfidence including barber bm;odean t (barber & odean, 2002), prosad jm; kapoor s; sengupta j; roychoudhary s (prosad et al., 2018), mushinada vnc;veluri vss (mushinada & veluri, 2020), glaser m;weber m (glaser & weber, 2007), musah g;domeher d;frimpong jm (musah et al., 2022). The third group (blue colour) includes daniel kd;hirshleifer d;subrahmanyam a (daniel et al., 2001), metawa n;hassan mk;metawa s;safa mf (metawa et al., 2019), sha n;ismail my (sha & ismail, 2021), scott j;stumpp m;xu p (scott et al., 2009). The research papers are related to the behavioural finance and investor's behaviour. These research papers are also coupled with research related to overconfidence and herding. The yellow cluster embrace baker hk;kumar s;goyal n (baker et al., 2021), parmitasari rda;syariati a;sumarlin (parmitasari et al., 2022), suresh g (suresh g, 2021), adil m;singh y;ansari ms (adil et al., 2021a). These research papers are related to investor's sentiments.

In this analysis we found that investor's sentiment is one of the common point where all the researches related to behavioural biases are getting connected. Bibliographic coupling is shown in figure-4.

Figure 4 bibliographic coupling
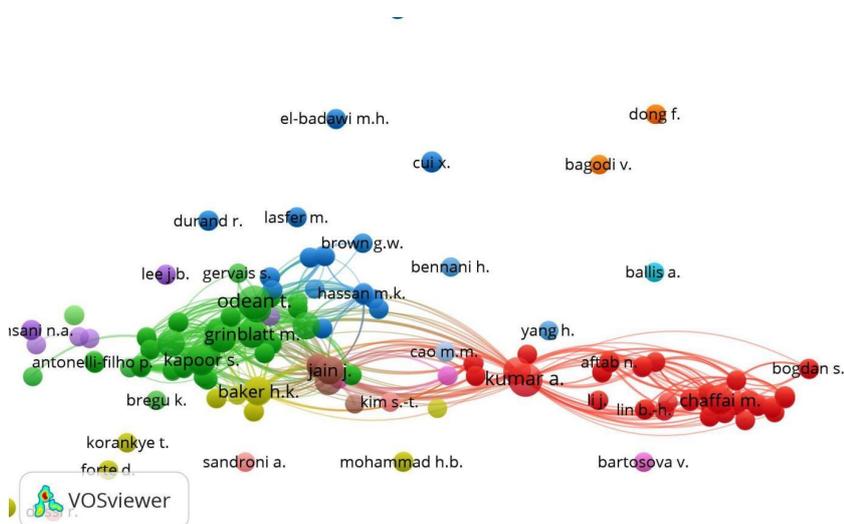
Result objective -2

Thematic analysis- our study focuses on the themes of the research papers. Figure 5 shows the thematic mapping of using the keywords from the research papers (cobo et al., 2018). The lower right quadrant shows the basic themes of the research i.e investor's investment, stock market, and trading bias. The lower left quadrant is displaying the themes that are either emerging (that are near to the centre point) and disappearing (that are near to corner at extreme left). On optimism and investor behaviour, researchers have not taken much interest. Impact of media and investor behaviour is getting attention of researchers the upper left quadrant shows the topics are developed with the connection of other disciplines. The map shows, information asymmetry, sensation seeking, mutual funds etc. The upper right quadrant shows are the motor themes. Herding, risk tolerance, emotional experiments are in this category.

Figure 5 thematic mapping
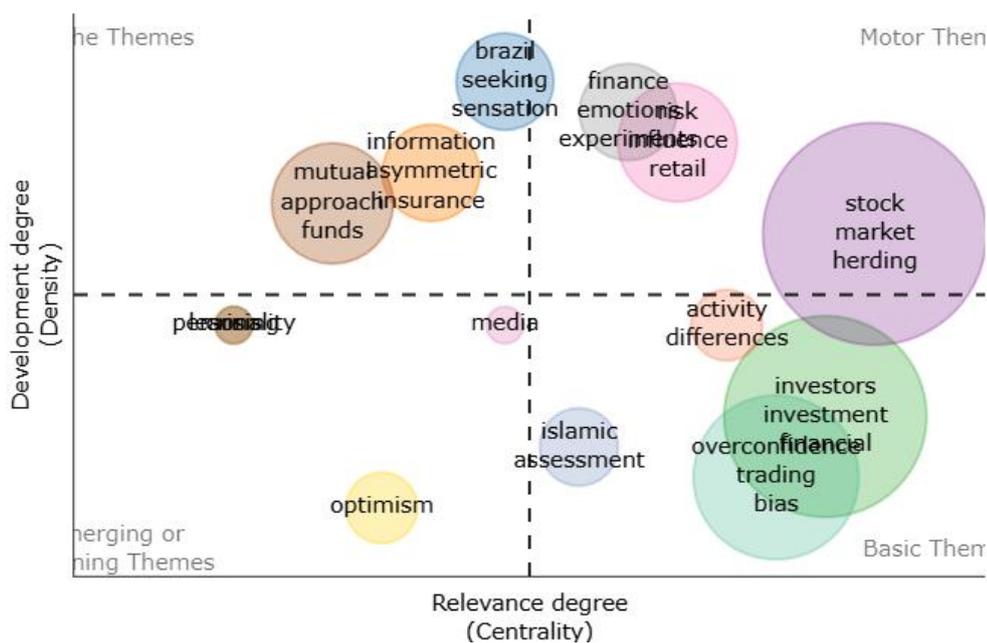
Content analysis-

1) Demographic characteristics and retail investor's bias.

Kannadhasan, (2015) identified gender, age, marital status, income, occupation and education over risk taking capability of retail investor. Scholars identified the effect of above demographic variables in shaping overconfidence[1], and herding bias[2] on an indian retail investor's psychology. Baker et al., (2019) included financial literacy with demographic variables discussed tested kannadhasan, (2015) on the indian retails investor's overconfidence, self-attribution[3], anchoring[4], representativeness[5], mental accounting[6], and herding. The results of above both study suggested that age, occupation and investment experience are significant variables in the study of investor's bias. Furthermore, gender affects the overconfidence of investor. Sutyanto et al., (2022) explored the effect of gender, age, income, occupation and their impact investor's bias on the citizens of indonesia. Shusha, (2017) in egypt, jalilvand et al., (2018) in iran. Kansal & singh, (2018) concentrated on demographic variables along with overconfidence bias of investors in delhi ncr, india. The study revealed about investors that earn high, have high frequency of investment for the

less time horizon, better investment experience, have shared financial responsibility in the family and prefer to invest in large cap stocks are subject to get affected from overconfidence bias. Ostrovsky-berman & litwin, (2019) comprehend the concept of kansal & singh, (2018). They examined the impact of investor's social network on their bias while an investor is about to retire or retired. The findings of the research suggest that the investors with a strong social network have orientation towards investment in risky instruments in comparison to those who are less connected to the family members. Respondents with single child were found less confident in investment in comparison to the respondents with large family.

A research by bailey et al., (2011) discovered that overconfidence, gambler fallacy, and framing bias are not just limited to the stock market investors, mutual fund investors also get affected from the same. Dwelling deep into the overconfidence bias, and disposition effect[7] abreu, (2019) concluded young retail investor are more prone to these bias. Mishra & metilda, (2015) investigated the investor's bias of indian mutual fund investors. Overconfidence and self-attribution bias tested against gender, experience, and education. The findings suggest there is a significant relationship between overconfidence and self-attribution bias. The study suggests that there is not just relationship between investor's bias and demographic variables. But relationship also exists between biases as well. A study conducted in indonesia by kartini & nahda, (2021) suggests that young college going students get affected from overconfidence bias easily due to high enthusiasm. Taylor & taylor, (2016) found that investor's style of investing get affected by the investor's bias. Herding is one of the prominent biases that affect the investment style of the investor. Brimble et al., (2013) explored another aspect of the human behaviour. The study revealed that religious women in australia are more conservative for the risky investment in comparison to the non-religious one. Liivamägi, (2016) categorise the investor's in three different categories. Investor's participated in national level examinations, investors with academic degree and investors with no academic degree. Investor's with no academic degree are less active to in stock trading. Investors with academic degree or participating in national level examinations are affected with self-attribution, anchoring and representative bias. Researchers claim that these biases affect positively for the investors. Furthermore, investors are able to earn better returns from the investors with no academic degree.

Researchers used questionnaire as a tool of data collection for their studies.
2)   Information availability and retail investor's bias
Sachdeva et al., (2021) suggested that market information is one of the most important drivers of herding behaviour of investor. Paul & bhattacharya, (2024) a survey conducted over indian investors that use online banking and investment services. The results claim that information and service awareness, transactional efficacy, trust, brand effect, and information technology support affect the herding behaviour. Dinç aydemir & aren, (2017) scrutinised overconfidence, illusion of control and commission bias[8] in relation to emotional intelligence, and financial literacy. High financial knowledge increases the complexity of the financial decisions due to information overload. Barber & odean, (2002) described that availability of online information about the stocks and investment instruments leads to increase overconfidence. Its sign is increase in excessive trading by the investor. Aziz & ansari, (2021) information available on the google attracts the attention of retail investors. The higher search results in the higher returns. Desagre & d'hondt, (2021) found a strong evidence of variation in trading activity and increase or decrease in google search. Hsieh et al., (2020) stated that google search positively linked with herding behaviour of retail investor. Researchers further added that herding is visible in small cap company shares. Z. Chen & craig, (2023) confirmed that information that flashes on google attracts the attention of the investors. It

further impact the demand of stocks and return of the stock as well. In the information provided to the investors on google attracts the young and inexperienced retail investors.

3)   Analysing retail investor's bias using trading data

Rashid et al., (2022) explained the relationship between overconfidence, and optimism[9] and investment decisions of retail investors in karachi stock exchange, pakistan. Researchers examined the trading volume and concluded that there is a positive relation exists between overconfidence and trading volume. Bennani, (2020) realised that a favourable and unfavourable communication from the financial institution's bulletin affects the retail investor's sentiments. It reflects in the trade volumes of the stock market. Bui et al., (2021) attempted to identify the determinants that decide the risk taking capabilities of a retail investor in vietnam. Data has been collected from retail investor's demography and researchers also analysed the trading behaviour by their analysis of specific market event. Retail investors prefer to trust on the herd mentality while investing in risky assets. Investor's miscalibarate the future prospects due to the effect of overconfidence and optimism bias. Carvalho, j., jordão da gama silva, p. V., & klotzle (2024) investigated the presence of herd behaviour in brazilian stock market from 2012 to 2020. The analysis confirmed the existence of herd behaviour in 2015 and 2019. Aziz & ansari, (2021) refer several studies in their research that claims about the relationship amid online search practices and the market returns. The researchers further concluded that with the fluctuations of google search the volume, price and returns in the market.

Desagre & d'hondt, (2021) mentioned about the positive relationship between the real-time online searches and trading activities in the stock market. Haykir & yagli, (2022) added further that google trends is a significant and only market related indicator to trace the bubble. They also recommend that google trends can be used as an variable for the future researches to estimate the bubble and take benefits from explosive price movements.

Result objective 3

Future directions of research are based on the gaps existing in the present area of research. In this section discusses the gaps explored during the bibliometric study.

1-   Methodological gap-

Studies conducted in the past decades used the survey method to analyse the investor's psychology. Several studies claims that individual suffer with "non-response bias". Berg, (2005) defined the non-response bias as individual's behaviour not responding on the questions of survey. Marquis et al., (1986) claim that an investor doesn't always resist but provide the unreliable responses on the personal details. Gupta & thornton, (2002) concluded that respondents avoid the responding over the sensitive personal information. The information that respondents provide are full of noise.

To study behavioural bias, researchers not just relay data collected through survey. Fellner-röhling & krügel, (2014), sakariyahu et al., (2024), kanojia et al., (2022), solnik & zuo, (2017), signorelli et al., (2012), paul & bhattacharya, (2024) examined the investor's bias via secondary data.

The above researchers analysed the behaviour through the act of the investor. Introduction of open source data platforms are providing new opportunities for researchers. A gap has been identified i.e lack of consideration to secondary data.

2-   Lack of longitudinal analysis

While analysing several research articles, it was observed that investor's behaviour has not been studied in the two or more different time zones. Longitudinal research on the investor behaviour can

be useful to identify the changes in the investor's behaviour in reference to change in technology, change in the political system, economic conditions, and change in the age of investor. Such study can be useful to examine the long term impact of several investment strategies. Long term trends can be studied only with the help of longitudinal studies.

3-   Questionnaire as primary source of data collection method

Several evidences administered about respondents either not interested to respond the questionnaires or respond with errors. Kansal & singh, (2018b) shah et al., (2018) moueed & hunjra, (2020) claimed that not all respondents responded correctly to the questionnaire.

In a survey method, a respondent feels pressured of giving a desirable response instead of an honest response. Especially, when response is related to sensitive topics or socially stigmatized behaviour. A limited depth of knowledge and contextual understanding influence the attitude, belief and behaviour. A fear of getting information used for purpose other than research also encourage respondent to non-response or incorrect response.

Table 5 questionnaires distributed and responses attained

Sr.n	Author	Questionnaire distributed	Relevant for response	Relevant %
1.	Kansal & singh, (2018b)	600	500	83%
2.	Shah et al., (2018)	315	143	45%
3.	Moueed & hunjra, (2020)	510	470	72%
4.	Abdallah & hilu,(2015)	179	166	92%
5.	Madaan & singh, (2019)	385	243	63%
6.	Karki et al., (2024)	163	150	92%
7.	Gupta & shrivastava, (2021)	1300	323	24%
8.	Sabir et al.,(2019)	650	340	52%
9.	Adil et al., (2021b)	281	253	80%

Conclusion-

The exploration of investor's decision making practices is been one of the prolific area among researchers. It also involves the understanding of investor's bias that affects investment decisions. Despite of existence of substantial research work the research gap remain in identifying how behavioural bias shape investment decisions. The study has applied bibliometric analysis to palpate and label the gaps deploying the tools like biblioshiny, vosviwer to scrutinize the trends of publication, thematic mapping and bibliographic coupling.

The findings unfold the upward trends in the research publication on mapping investor bias, with a considerable expansion in 2011. The analysis also underlines the pinnacle journals contributing in this field such as the journal of behavioral finance and the journal of financial economics. It also emphasize the geographical distribution of research contribution with a considerable share from the countries he usa, india, uk, and china.

Thematic analysis highlights the various research themes. The studies comprises themes like demographic characteristics and retail investor's bias, impact of information on retail investor's bias, analysis of bias using trading data.

Moreover, the study has identified the methodological gaps, such as significance of survey based data. Such data may affect from the non-responsiveness and inaccuracy. There is also a dearth of

longitudinal research in understanding the investor's behaviour over time. It can be a milestone in developing the investment strategies.

In the conclusion, the research shed a light on the landscape of investment research involving investor's psychology. It spots the areas of future research such as employing secondary data, longitudinal research and alternative sources of data collection. By considering the mentioned gaps researchers can comprehend the investor's behaviour and contribute to a well informed decision making in financial market.

Reference

1. Abdallah, s., & hilu, k. (2015). Exploring determinants to explain aspects of individual investors' financial behaviour. Australasian accounting, business and finance journal, 9(2), 4–22. Https://doi.org/10.14453/aabfj.v9i2.2
2. Abreu, m. (2019). How biased is the behavior of the individual investor in warrants? Research in international business and finance, 47, 139–149. Https://doi.org/10.1016/j.ribaf.2018.07.006
3. Adil, m., singh, y., & ansari, m. S. (2021a). How financial literacy moderate the association between behaviour biases and investment decision? Asian journal of accounting research, ahead-of-p(ahead-of-print). Https://doi.org/10.1108/ajar-09-2020-0086
4. Adil, m., singh, y., & ansari, m. S. (2021b). How financial literacy moderate the association between behaviour biases and investment decision? Asian journal of accounting research, 7(1), 17–30. Https://doi.org/10.1108/ajar-09-2020-0086
5. Ansari, a., & ansari, v. A. (2021). Do investors herd in emerging economies? Evidence from the indian equity market. Managerial finance.
6. Arora, m., & kumari, s. (2015). Risk taking in financial decisions as a function of age, gender: Mediating role of loss aversion and regret. International journal of applied psychology, 5(4), 83–89. Https://doi.org/10.5923/j.ijap.20150504.01
7. Aziz, t., & ansari, v. A. (2021). How does google search affect the stock market? Evidence from indian companies. Vision, 25(2), 224–232. Https://doi.org/10.1177/0972262920985368
8. Bailey, w., kumar, a., & ng, d. (2011). Behavioral biases of mutual fund investors. Journal of financial economics, 102(1), 1–27. Https://doi.org/10.1016/j.jfineco.2011.05.002
9. Bakar, s., & yi, a. N. C. (2016). The impact of psychological factors on investors' decision making in malaysian stock market: A case of klang valley and pahang. Procedia economics and finance, 35(october 2015), 319–328. Https://doi.org/10.1016/s2212-5671(16)00040-x
10. Baker, h. K., kumar, s., & goyal, n. (2021). Personality traits and investor sentiment. Review of behavioral finance. Https://doi.org/10.1108/rbf-08-2017-0077
11. Baker, h. K., kumar, s., goyal, n., & gaur, v. (2019). How financial literacy and demographic variables relate to behavioral biases. Managerial finance, 45(1), 124–146. Https://doi.org/10.1108/mf-01-2018-0003
12. Barber, b. M., & odean, t. (2002). Online investors: Do the slow die first? Review of financial studies, 15(2 spec.), 455–487. Https://doi.org/10.1093/rfs/15.2.455
13. Barber, b. M., odean, t., & zhu, n. (2009). Do retail trades move markets? Review of financial studies, 22(1), 151–186. Https://doi.org/10.1093/rfs/hhn035
14. Bennani, h. (2020). Central bank communication in the media and investor sentiment. Journal of economic behavior and organization, 176, 431–444. Https://doi.org/10.1016/j.jebo.2020.05.022
15. Berg, n. (2005). Munich personal repec archive non-response bias. Munich personal repec archive, 26373(1), 1–34.
16. Brimble, m., vyvyan, v., & ng, c. (2013). Belief and investing: Preferences and attitudes of the faithful. Australasian accounting, business and finance journal, 7(1), 23–41. Https://doi.org/10.14453/aabfj.v7i1.3

17. Brown, g. W., & cliff, m. T. (2005). Investor sentiment and asset valuation. Journal of business, 78(2), 405–440. Https://doi.org/10.1086/427633

18. Bui, l. D., le, t. C., quang, n., & wong, w. (2021). Determinants of the possibilities by investors ' risk- taking : Empirical evidence from vietnam. Cogent economics & finance, 9(1). Https://doi.org/10.1080/23322039.2021.1917106

19. Cao, s., & wang, j. (2021). Waiting and following: Within-industry herding behavior in annual report disclosure. China journal of accounting research, 14(3), 295–314. Https://doi.org/10.1016/j.cjar.2021.05.004

20. Carvalho, j., jordão da gama silva, p. V., & klotzle, m. C. (2024). Herding and google search queries in the brazilian stock market. Review of behavioral finance, 16(4), 341–359.

21. Chaffai, m., & medhioub, i. (2018). Herding behavior in islamic gcc stock market: A daily analysis. International journal of islamic and middle eastern finance and management, 11(2), 182–193. Https://doi.org/10.1108/imefm-08-2017-0220

22. Chen, c. S., cheng, j. C., lin, f. C., & peng, c. (2017). The role of house money effect and availability heuristic in investor behavior. Management decision., 55(8), 1598–1612. Https://doi.org/10.1108/md-10-2016-0725

23. Chen, z., & craig, k. A. (2023). Active attention, retail investor base, and stock returns. Journal of behavioral and experimental finance, 39, 100820. Https://doi.org/https://doi.org/10.1016/j.jbef.2023.100820

24. Corzo, t., prat, m., & vaquero, e. (2014). Behavioral finance in joseph de la vega's confusion de confusiones. Journal of behavioral finance, 15(4), 341–350. Https://doi.org/10.1080/15427560.2014.968722

25. Daniel, k. D., & hirshleifer, d. A. (2015). Overconfident investors, predictable returns, and excessive trading. Journal of economic perspectives, 29(4), 61–88. Https://doi.org/10.2139/ssrn.2721140

26. Daniel, k. D., hirshleifer, d., & subrahmanyam, a. (2001). Overconfidence, arbitrage, and equilibrium asset pricing. The journal of finance, 56(3), 921–965. Https://doi.org/10.1023/a:1009062519643

27. Desagre, c., & d'hondt, c. (2021). Googlization and retail trading activity. Journal of behavioral and experimental finance, 29, 100453. Https://doi.org/10.1016/j.jbef.2020.100453

28. Dinç aydemir, s., & aren, s. (2017). Do the effects of individual factors on financial risk-taking behavior diversify with financial literacy? Kybernetes, 46(10), 1706–1734. Https://doi.org/10.1108/k-10-2016-0281

29. Eduardsen, j., & marinova, s. (2020). Internationalisation and risk: Literature review, integrative framework and research agenda. International business review, 29(3).

30. Fama, e. (1970). Efficient capital markets: A review of theory and empirical work. The journal of finance, 25(2), 383–417. Https://doi.org/doi:10.2307/2325486

31. Fama, e. F. (1970). Efficient market hypothesis: A review of theory and empirical work. Journal of finance, 2(25), 28–30.

32. Fellner-röhling, g., & krügel, s. (2014). Judgmental overconfidence and trading activity. Journal of economic behavior and organization, 107(pb), 827–842. Https://doi.org/10.1016/j.jebo.2014.04.016

33. Frino a, l., & g, w. D. (2015). Investor characteristics and the disposition effect. Pac basin finance, 31, 1–12. Https://doi.org/https:// doi. Org/ 10. 1016/j. Pacfin. 2014. 10. 009

34. Gabbori, d., virk, n., aftab, n., & awartani, b. (2022). The impact of islamic events on herding behaviour in saudi arabian equities market. International journal of finance & economics. Https://doi.org/10.1002/ijfe.2678

35. Glaser, m., & weber, æ. M. (2007). Overconfidence and trading volume. Geneva risk insur rev, m(january), 1–36. Https://doi.org/10.1007/s10713-007-0003-3

36. Gleason, k. C., mathur, i., & peterson, m. A. (2004). Analysis of intraday herding behavior among the sector etfs. Journal of empirical finance, 11(5), 681–694. Https://doi.org/10.1016/j.jempfin.2003.06.003

37. Grinblatt, m., & keloharju, m. (2009). Sensation seeking, overconfidence, and trading activity. The journal of finance, 64(2), 549–578.

38. Gupta, s., & shrivastava, m. (2021). Herding and loss aversion in stock markets: Mediating role of fear of missing out (fomo) in retail investors. International journal of emerging markets. Https://doi.org/10.1108/ijoem-08-2020-0933

39. Gupta, s., & thornton, b. (2002). Circumventing social desirability response bias in personal interview surveys. American journal of mathematical and management sciences, 22(3–4), 369–383. Https://doi.org/10.1080/01966324.2002.10737599

40. Haykir, o., & yagli, i. (2022). Speculative bubbles and herding in cryptocurrencies. Financial innovation, 8(1). Https://doi.org/10.1186/s40854-022-00383-0

41. Hsieh, s., chan, c., & wang, m. (2020). Retail investor attention and herding behavior. Journal of empirical finance, 59(october 2018), 109–132. Https://doi.org/10.1016/j.jempfin.2020.09.005

42. Jain, j., walia, n., kaur, m., & singh, s. (2021). Behavioural biases affecting investors' decision-making process: A scale development approach. Management research review. Https://doi.org/10.1108/mrr-02-2021-0139

43. Jain, j., walia, n., singh, s., & jain, e. (2021). Mapping the field of behavioural biases: A literature review using bibliometric analysis. Management review quarterly, 0123456789. Https://doi.org/10.1007/s11301-021-00215-y

44. Jain, j., walia, n., singh, s., & jain, e. (2022). Mapping the field of behavioural biases: A literature review using bibliometric analysis. In management review quarterly (vol. 72, issue 3). Springer international publishing. Https://doi.org/10.1007/s11301-021-00215-y

45. Jalilvand, a., noroozabad, m. R., & switzer, j. (2018). Informed and uninformed investors in iran: Evidence from the tehran stock exchange. Journal of economics and business, 95, 47–58. Https://doi.org/10.1016/j.jeconbus.2017.08.004

46. Kahneman, d., knetsch, j. L., & thaler, r. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. Journal of economic perspectives, 5(1), 193–206. Https://doi.org/10.1257/jep.5.1.193

47. Kamesaka, a., nofsinger, j. R., & kawakita, h. (2003). Investment patterns and performance of investor groups in japan. Pacific basin finance journal, 11(1), 1–22. Https://doi.org/10.1016/s0927-538x(02)00095-1

48. Kannadhasan, m. (2015a). Retail investors' financial risk tolerance and their risk-taking behaviour: The role of demographics as differentiating and classifying factors. Iimb management review, 27(3), 175–184. Https://doi.org/10.1016/j.iimb.2015.06.004

49. Kannadhasan, m. (2015b). Retail investors' financial risk tolerance and their risk-taking behaviour: The role of demographics as differentiating and classifying factors. Iimb management review, 27(3), 175–184. Https://doi.org/10.1016/j.iimb.2015.06.004

50. Kanojia, s., singh, d., & goswami, a. (2022). Impact of herding on the returns in the indian stock market: An empirical study. Review of behavioral finance, 14(1), 115–129. Https://doi.org/10.1108/rbf-01-2020-0017

51. Kansal, p., & singh, s. (2018a). Determinants of overconfidence bias in indian stock market. Qualitative research in financial markets, 10(4), 381–394. Https://doi.org/10.1108/qrfm-03-2017-0015

52. Kansal, p., & singh, s. (2018b). Determinants of overconfidence bias in indian stock market. Qualitative research in financial markets, 10(4), 381–394. Https://doi.org/10.1108/qrfm-03-2017-0015

53. Karki, d., bhattarai, g., dahal, r. K., & sanjel, n. (2024). Investment decisions in initial public offerings and over-subscription perceptions among investors. Corporate governance and organizational behavior review, 8(1), 105–114. Https://doi.org/10.22495/cgobrv8i1p9

54. Kartini, k., & nahda, k. (2021). Behavioral biases on investment decision: A case study in indonesia. Journal of asian finance, economics and business, 8(3), 1231–1240. Https://doi.org/10.13106/jafeb.2021.vol8.no3.1231

55. Kumar, a. (2020). Empirical investigation of herding in cryptocurrency market under different market regimes. Review of behavioral finance, 13(3), 297–308.

56. Kumar, s., & goyal, n. (2016). Evidence on rationality and behavioural biases in investment decision making. Qualitative research in financial markets, 8(4), 270–287. Https://doi.org/10.1108/qrfm-05-2016-0016

57. Liivamägi, k. (2016). Investor education and trading activity on the stock market. Baltic journal of economics, 16(2), 114–131. Https://doi.org/10.1080/1406099x.2016.1189058

58. Madaan, g., & singh, s. (2019). An analysis of behavioral biases in investment decision-making. International journal of financial research, 10(4), 55–67. Https://doi.org/10.5430/ijfr.v10n4p55

59. Marquis, k. H., marquis, m. S., & polich, j. M. (1986). Response bias and reliability in sensitive topic surveys. Journal of the american statistical association, 81(394), 381–389. Https://doi.org/10.1080/01621459.1986.10478282

60. Metawa, n., hassan, m. K., metawa, s., & safa, m. F. (2019). Impact of behavioral factors on investors' financial decisions: Case of the egyptian stock market. International journal of islamic and middle eastern finance and management, 12(1), 30–55. Https://doi.org/10.1108/imefm-12-2017-0333

61. Mishra, k. C., & metilda, m. J. (2015). A study on the impact of investment experience, gender, and level of education on overconfidence and self-attribution bias. Iimb management review, 27(4), 228–239. Https://doi.org/10.1016/j.iimb.2015.09.001

62. Moueed, a., & hunjra, a. I. (2020). Use anger to guide your stock market decision-making: Results from pakistan. Cogent economics and finance, 8(1). Https://doi.org/10.1080/23322039.2020.1733279

63. Musah, g., domeher, d., & frimpong, j. M. (2022). Presidential election uncertainty and investor overconfidence bias in sub-saharan african stock markets. African journal of economic and management studies. Https://doi.org/10.1108/ajems-03-2022-0075

64. Mushinada, v. N. C. (2020). How do investors behave in the context of a market crash? Evidence from india. International journal of emerging markets, 15(6), 1201–1217. Https://doi.org/10.1108/ijoem-05-2019-0357

65. Mushinada, v. N. C., & veluri, v. S. S. (2020). Self-attribution, overconfidence and dynamic market volatility in indian stock market. Global business review, 21(4), 970–989. Https://doi.org/10.1177/0972150918779288

66. Ng, s., zhuang, z., toh, m., ong, t., & teh, b. (2022). Exploring herding behavior in an innovative- oriented stock market : Evidence from chinext. Journal of applied economics, 25(1), 523–542. Https://doi.org/10.1080/15140326.2022.2050992

67. Omane-adjepong, m., paul alagidede, i., lyimo, a. G., & tweneboah, g. (2021). Herding behaviour in cryptocurrency and emerging financial markets. Cogent economics and finance, 9(1). Https://doi.org/10.1080/23322039.2021.1933681

68. Ostrovsky-berman, e., & litwin, h. (2019). Social network and financial risk tolerance among investors nearing and during retirement. Journal of family and economic issues, 40(2), 237–249. Https://doi.org/10.1007/s10834-018-9592-5

69. Parmitasari, r. D. A., syariati, a., & sumarlin. (2022). Chain reaction of behavioral bias and risky investment decision in indonesian nascent investors. Risks, 10(8). Https://doi.org/10.3390/risks10080145

70. Paul, p., & bhattacharya, s. (2024). Impact of banking functions on online investment intention in india: Examining the mediating role of service experience. Investment management and financial innovations, 21(1), 131–145. Https://doi.org/10.21511/imfi.21(1).2024.11

71. Pessin, v. Z., yamane, l. H., & siman, r. R. (2022). Smart bibliometrics: An integrated method of science mapping and bibliometric analysis. Scientometrics, 127(6), 3695–3718. Https://doi.org/10.1007/s11192-022-04406-6

72. Piotrowski, m., & bünnings, c. (2022). How heuristics in judgement influence the securities investment decision process. Journal of financial services marketing, 29(1), 97–105. Https://doi.org/10.1057/s41264-022-00184-7

73. Pompian, m. M. (2006). Behavioral finance and wealth management how to build optimal portfolios that account for investor biases. In financial markets and portfolio management. John wiley & sons, inc. Https://doi.org/10.1007/s11408-007-0065-3

74. Prosad, j. M., kapoor, s., sengupta, j., & roychoudhary, s. (2018). Overconfidence and disposition effect in indian equity market: An empirical evidence. Global business review, 19(5), 1303–1321. Https://doi.org/10.1177/0972150917726660

75. Rashid, k., tariq, y. Bin, & rehman, m. U. (2022). Behavioural errors and stock market investment decisions: Recent evidence from pakistan. Asian journal of accounting research, 7(2), 129–145. Https://doi.org/10.1108/ajar-07-2020-0065

76. Rehman, m. Z. U., ul abidin, z., rizwan, f., abbas, z., & baig, s. A. (2017). How investor sentiments spillover from developed countries to developing countries? Cogent economics and finance, 5(1). Https://doi.org/10.1080/23322039.2017.1309096

77. Sabir, s. A., mohammad, h. Bin, & shahar, h. B. K. (2019). The role of overconfidence and past investment experience in herding behaviour with a moderating effect of financial literacy: Evidence from pakistan stock exchange. Asian economic and financial review, 9(4), 480–490. Https://doi.org/10.18488/journal.aefr.2019.94.480.490

78. Sachdeva, m., lehal, r., gupta, s., & garg, a. (2021). What make investors herd while investing in the indian stock market? A hybrid approach. Review of behavioral finance. Https://doi.org/10.1108/rbf-04-2021-0070

79. Sakariyahu, r., paterson, a., chatzivgeri, e., & lawal, r. (2024). Chasing noise in the stock market: An inquiry into the dynamics of investor sentiment and asset pricing. In review of quantitative finance and accounting (vol. 62, issue 1). Springer us. Https://doi.org/10.1007/s11156-023-01214-8

80. Scott, j., stumpp, m., & xu, p. (2009). Overconfidence bias in international stock prices. The journal of portfolio management, 29(2), 80–89. Https://doi.org/10.3905/jpm.2003.319875

81. Sha, n., & ismail, m. Y. (2021). Behavioral investor types and financial market players in oman. Journal of asian finance, economics and business, 8(1), 285–294. Https://doi.org/10.13106/jafeb.2021.vol8.no1.285

82. Shah, s. Z. A., ahmad, m., & mahmood, f. (2018). Heuristic biases in investment decision-making and perceived market efficiency: A survey at the pakistan stock exchange. Qualitative research in financial markets, 10(1), 85–110. Https://doi.org/10.1108/qrfm-04-2017-0033

83. Sharpe, w. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. The jouranal of finance, xix(3), 425–442. Https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

84. Shin, s. H., kim, k. T., & seay, m. (2020). Sources of information and portfolio allocation. Journal of economic psychology, 76(october 2019), 1–21. Https://doi.org/10.1016/j.joep.2019.102212

85. Shusha, a. A. (2017). Does financial literacy moderate the relationship among demographic characteristics and financial risk tolerance? Evidence from egypt. Australasian accounting, business and finance journal, 11(3), 67–86. Https://doi.org/10.14453/aabfj.v11i3.6

86. Signorelli, p. F. C. L., camilo-da-silva, e., & barbedo, c. H. D. S. (2012). An examination of herding behavior in the brazilian equity market. Ssrn electronic journal. Https://doi.org/10.2139/ssrn.1969319

87. Simon, h. A. (1956). Rational choice and the structure of the environment. Psychological review, 63(3).

88. Singal, v. (2006). Beyond the random walk: A guide to stock market anomalies and low-risk investing. Oxford university press.

89. Singh, s., & walia, n. (2022). Momentum investing: A systematic literature review and bibliometric analysis. Management review quarterly, 72(1), 87–113. Https://doi.org/10.1007/s11301-020-00205-6

90. Solnik, b., & zuo, l. (2017). Relative optimism and the home bias puzzle. Review of finance, 21(5), 2045–2074. Https://doi.org/10.1093/rof/rfw021

91. Stålnacke, o. (2019). Individual investors' information use, subjective expectations, and portfolio risk and return. European journal of finance, 25(15), 1351–1376. Https://doi.org/10.1080/1351847x.2019.1592769

92. Statman, m. (2014). Behavioral finance: Finance with normal people. Borsa istanbul review, 14(2), 65–73. Https://doi.org/10.1016/j.bir.2014.03.001

93. Statman, m., thorley, s., & vorkink, k. (2006). Investor overconfidence and trading volume. Review of financial studies, 19(4), 1531–1565.

94. Suresh g. (2021). Impact of financial literacy and behavioural biases on investment decision-making. Fiib business review, august. Https://doi.org/10.1177/23197145211035481

95. Sutyanto, d. N., achsani, n. A., sembel, r., & andati, t. (2022). Investment decisions in emerging market: Demographic analysis of individual investor in indonesia stock exchange. Asian economic and financial review, 12(2), 99–120. Https://doi.org/10.18488/5002.v12i2.4415

96. Taylor, s., & taylor, r. (2016). The effect of style, feedback, and context on portfolio exploratory behavior. Journal of behavioral finance, 17(3), 217–228. Https://doi.org/10.1080/15427560.2016.1170681

97. Thaler, r. H. (1999). Mental accounting matters. Journal of behavioral decision making, 206(september 1998), 183–206.

98. Virlics, a. (2013). Emotions in economic decision making: A multidisciplinary approach. Procedia - social and behavioral sciences, 92(lumen), 1011–1015. Https://doi.org/10.1016/j.sbspro.2013.08.792