Journal of Capital Markets Studies

The rise of passive investing: a systematic literature review applying PRISMA framework

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Received 3 December 2023
Revised 14 March 2024
23 March 2024
Accepted 8 April 2024

Abstract

Purpose – Passive investing has established itself as the dominant force in the world of professionally managed assets, surpassing the concept of index funds. Its meteoric rise is fueled by investors' preference for its dual benefits of strong diversification and low cost. A comprehensive study of the economic model, addressed areas and market structure has not yet been conducted, despite the existence of numerous studies on more specific topics. To address this gap, this paper examines 943 articles on passive investing published between 1998 and 2022 in SCOPUS and Web of Science.

Design/methodology/approach – The study utilizes the most pertinent tools for conducting a systematic review by the PRISMA framework. This article is the result of SLR and extensive bibliometric analysis. Contextualized systematic literature review is used to screen and select bibliographic data, which is then subjected to a variety of bibliometric analyses. The study provides a bibliometric overview of works on passive investment research that are indexed in Scopus and Web of Science. Bibliometrix, VoS Viewer and Cite Space are the tools used to conduct content and network analysis, to ascertain the present state of research, as well as its focus and direction.

Findings – Our exhaustive analysis yields important findings. One, the previous decade has witnessed a substantial increase in the number of publications and citations; in particular, the inter-disciplinary and international scope of related research has expanded; Second, the top three clusters on "active versus passive funds," "price discovery and market structures" and "exchange-traded funds (ETFs) as an alternative" account for more than fifty percent of the domain's knowledge; Third, "Leveraged ETFs (LETFs)" and "environmental, social and governance (ESG)" are the two emerging themes in the passive investing research. Fourth, despite its many benefits, passive investing is not suitable for everyone. To get the most out of what passive investing has to offer, investors, intermediaries and regulators must all exercise sufficient caution. Our study makes a substantial contribution to the field by conducting a comprehensive bibliometric analysis of the existing literature, highlighting key findings and implications, as well as future research directions.

Research limitations/implications – While the study contributes significantly to the field of knowledge, it has several limitations that must be considered when interpreting its findings and implications. With our emphasis on academic journals, the study analyzed only peer-reviewed journal articles, excluding conference papers, reports and technical articles. While we are confident that our approach resulted in a comprehensive and representative database, our reliance on Elsevier Scopus and Web of Science may have resulted in us overlooking relevant work accessible only through other databases. Additionally, specific bibliometric properties may not be time-stable, and certain common distribution patterns of the passive investing literature may still be developing.

Practical implications – With this study, it has been possible to observe and chart the high growth trajectory of passive investing research globally, especially post-US subprime crisis. Despite the widespread

JEL Classification — C23, G12, G23

Declaration of conflicting interests: The authors declared no existing or potential conflict of interests with respect to the research, authorship and/ or publication of this paper.

Research involving human participants and/or animals: The author(s) declared that the study was conducted without the involvement of human participants and/or Animals.

Informed consent: The author(s) declare that the study was conducted on well-published secondary data and does not involve any informed consent keeping with research ethics.

Journal of Capital Markets Studies
Emerald Publishing Limited
2514-4774
DOI 10.1108/JCMS-12-2023-0046

adoption of passive investing as an investment strategy, it is not a one-size-fits-all proposition. Market conditions change constantly, and it frequently requires an informed eye to determine when and how much to shift away from active investments and toward passive ones. Currency ETFs enable investors to implement a carry trade strategy in their portfolios; however, as a word of caution, currency stability and liquidity can play a significant role in international ETFs. Similarly, LETFs may be better suited for dynamic strategies and offer less value to a long-term investor. Lastly, the importance of investor education cannot be underestimated in the name of the highly diversified portfolio when using passive alternatives, for which necessary efforts are required by regulators and investors alike.

Social implications – The inexorable trend to passive investing creates numerous issues for fund management, including fee and revenue pressure, which forces traditional managers to seek new revenue streams, such as illiquid and private assets, which also implies increased portfolio risk. Additionally, the increased transparency and efficiency associated with the ETF market indicates that managers must rethink the entire value chain, beginning with technology and the way investments interact. Passive investments have triggered changes in market structure that are still not fully understood or factored in. Active management and a range of valuation opinions on whether a price is "too low" or "too high" provide much-needed depth to a market as it attempts to strike a delicate balance between demand and supply forces, ensuring liquidity at all price points.

Originality/value – I hereby certify that I am the sole author of this paper and that no part of this manuscript has been published or submitted for publication.

Keywords Passive investing, ETF, Index funds, Benchmarking, Bibliometric, Systematic

Paper type Literature review

1. Introduction

Globally, and particularly in developed countries like the United States, there has been a substantial shift in investor preference toward passive investing. Passive asset management, commonly known as passive investing, is an investment approach that monitors a market-weighted index (Sharpe, 1991). It can be accomplished by holding any or a combination of index funds, exchange-traded funds (ETFs), Index future contracts, Index futures options or Stock Market Index Swaps (Hasbrouck, 2003; Stoll and Whaley, 1990; Constantinides *et al.*, 2011) Passive investing, which is most widespread in equities, is gradually becoming more popular in other investment categories such as bonds, commodities and hedge funds (Jaeger and Wagner, 2005). When compared to actively managed funds, it provides good diversification, minimal transaction costs and lower turnover (Baks *et al.*, 2001; Pézier and White, 2008).

Passive investing is founded on the efficient market hypothesis (EMH), which was developed in the 1960s and contends that shares always trade at their fair market value and that persistent alpha generation is impossible. This theory rejected the efficacy of stock selection and market timing and represented the earliest school of thought on passive investing. Index funds were introduced in the 1970s and have been restricted to large pension and social security institutions since then (Sorensen *et al.*, 1998; Clark and Hebb, 2004; Elton *et al.*, 2007; Ayres and Curtis, 2014). Gruber (1996) brought attention to the paradox that investors purchase actively managed funds even though they underperform index funds on average. With growing investor dissatisfaction with active fund underperformance (Sorensen *et al.*, 1998; Malkiel, 2005; Sorensen *et al.*, 1998) and a desire to reduce costs across social benefit schemes, the relative appeal of passive investments has increased by multiple degrees in the aftermath of the 2008–2012 subprime crisis (Elton *et al.*, 2002). This has piqued the interest of industry, academia, and researchers alike, resulting in a slew of studies examining their performance (Avellaneda and Lee, 2010). The literature on passive investing, hence, has exploded in recent years.

The testing of the EMH, the comparative performance assessment of passive portfolios to curated folios, and investor biases in passive investing have all been topics of discussion in the past (Frino and Gallagher, 2001; Elton *et al.*, 2004; Choi *et al.*, 2010; Guercio and Reuter, 2014; Cremers *et al.*, 2016; Fahling *et al.*, 2019). Multiple studies addressing various characteristics of index funds, such as fee expense (Hortacsu and Syverson, 2004; Elton *et al.*, 2012), return

volatility (Goetzmann and Massa, 2003), tracking error (TE) (Meade and Salkin, 1990; Chen *et al.*, 2006), liquidity, investor purchase and redemption patterns (O'Neal, 2004), price discovery (Chen and Gau, 2009), hidden costs (Petajisto, 2011) and portfolio allocation (Fan *et al.*, 2016) have been conducted since the inception of index funds. Recent research on index funds has progressed to sparse portfolios (Takeda *et al.*, 2013), goal programming (Wu *et al.*, 2007), algorithm-assisted allocations (Schoenfeld, 2017) and financial innovations (Cremers *et al.*, 2016).

Lo (2007) integrated the EMH with behavioral finance to create the adaptive market hypothesis (AMH), which states that rational investors can swiftly become irrational in reaction to increased market volatility. In the aftermath of the US Subprime crisis, index funds were heavily criticized for causing the 2007–2008 spike in commodity futures prices, consequently, numerous studies examined the effect of index funds on the prices of underlying assets (Malkiel and Radisich, 2001; Michał Falkowski, 2011; Irwin and Sanders 2011; Ivanov, 2013; Hamilton and Wu, 2015).

ETFs, which manage trillions of dollars (USD) in capital flows in developed economies, are the most recent and significant development in modern capital markets after index funds. Since their introduction, various barometers of ETF performance have been explored in depth, including TE (Johnson, 2009; Shin and Soydemir, 2010; Chu, 2011), pricing efficiency (Israeli *et al.*, 2017) and fund flows (Clifford *et al.*, 2014). As ETFs gained prominence, their role in price discovery and information transmission (Tse and Martinez, 2007; Levy and Lieberman, 2013; Haslam *et al.*, 2018), volatility in prices of underlying (Gleason *et al.*, 2004), market liquidity (Boehmer and Boehmer, 2003; Ben-David *et al.*, 2017), market microstructures (Gao *et al.*, 2018), market co-integration and error correction (Chou and Chung, 2006; Delcoure and Zhong, 2007; Broman, 2016), volatility spillover (Krause and Tse, 2013; Inci, 2018) has been investigated in detail. With growing environmental consciousness, ETF research has shifted to evaluating the efficacy of investments in alternative energy (Miralles-Quirós and Miralles-Quirós, 2019). Furthermore, inter se comparison between index funds and ETFs on a variety of criteria, including substitutability, cost structure, investor types and risk-adjusted returns have been conducted (Beneish and Gardner, 1995; Kostovetsky, 2003; Harper *et al.*, 2006). Leveraged ETFs (LETFs) are one of the most recent financial developments in the ETF realm, and various studies have been conducted to explain this concept (Avellaneda and Zhang, 2010; Charupat and Miu, 2011).

Notwithstanding economic challenges, unpredictability and an initial upheaval precipitated by the coronavirus disease 2019 (COVID-19) pandemic, the asset management sector rebounded in 2022 and produced favorable returns. The assets under management (AUM) of passive funds are projected to reach USD 34 trillion by 2025, according to the Global Asset Management Report, (2021) by Boston Consulting Group. Systematic reviews serve the purpose of identifying particular domains that necessitate further research. Additionally, they enable professionals to obtain a comprehensive understanding (Randhawa *et al.*, 2016). Previous studies have conducted literature reviews on distinct aspects of passive investing strategies, such as fixed-income and index investing (Tang and Xu, 2017), the effects, trading, and institutions of ETFs (Madhavan, 2012; Joshi and Dash, 2024), and an overview of Indian index funds (Sarkar *et al.*, 2013). Despite the expanding corpus of scholarly work concerning specific facets, a comprehensive overview of the overarching passive investing strategy remains extremely scarce. Our research is most closely aligned with the findings of the Fisch *et al.* (2019) study. In light of the market mechanism, the study offers a comprehensive analysis of the theoretical framework from institutional, policy and regulatory standpoints to enlighten passive investors. However, a review of the existing literature in this field is not included in the study. Given these overarching concerns, the expansion and development of the corpus of research in numerous disciplines emphasizes the need for a quantitative investigation to establish a comprehensive framework, identify noteworthy trends and determine directions for future research. Our study investigates the subsequent research

inquiries by employing a systematic literature review (SLR) and a rigorous bibliometric analysis.

RQ1. What characterizes the current research trend in passive investing?

RQ2. Which sources, articles and authors are the most influential in this research domain?

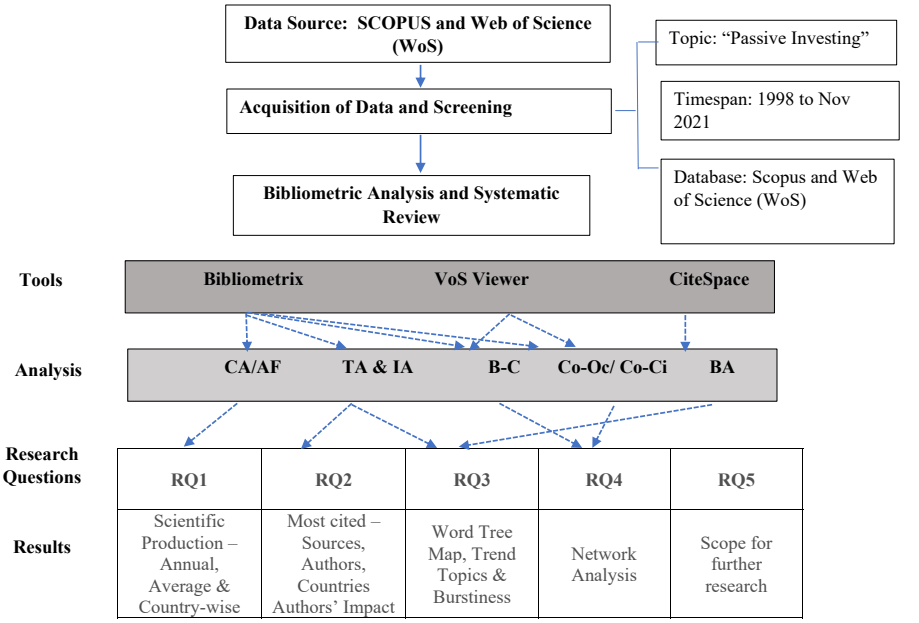
RQ3. What are the dominating themes in this field of study?

RQ4. What has been the evolution of the conceptual and intellectual structure (IS) over time?

RQ5. What is the future research scope?

2. Data and research methodology

This article is the result of SLR and extensive bibliometric analysis. Contextualized SLR (Tranfield *et al.*, 2003) is used to screen and select bibliographic data, which is then subjected to a variety of bibliometric analyses (Zupic and Čater, 2015). Bibliometric analysis as a technique entails the application of statistical tools to the examination of the bibliographic attributes of a body of literature. We follow Pattnaik *et al.* (2020) as a methodical approach for data selection and research design as depicted in Figure 1.



Note(s): Abbreviations utilized: CA/AF – Citation Analysis/ Analysis of Frequency; IA – Impact Factor Analysis; B-C – Bibliographic Coupling; Co-Oc – Co-Occurrence of keywords/titles/abstracts; Co-Ci- Co-citation analysis of References/Sources/Authors; BA- Burstiness Analysis of Citation/ References/ Sources

Source(s): Authors' own work

Figure 1.
Data selection and research design

2.1 Search criteria and data retrieval

The collected data adhered to a systematic research methodology that outlined the essential stages required to perform a literature review following the PRISMA framework. For the presentation of evidence in systematic reviews and meta-analyses, PRISMA is the acknowledged standard. Journals that underwent peer review were the only sources considered for this study. The evaluation process excluded reports, conference proceedings, publications and theses. Analyses of 943 articles indexed by Scopus and WoS were conducted to address the aforementioned research questions. In selecting these documents, five criteria were considered: (1) Refereed academic journals (to ensure the highest quality of refereeing), (2) Articles published between 1998 and 2021, (3) Indexed by Scopus and WoS, (4) Filtered using keywords and Boolean operators: "passive investing or passive invest*," or "index fund*," or "exchange-traded fund" or "ETF*" or "indexing,"; (5) The study includes all eligible non-duplicate publications in the English language that met the filtration criteria. The process of retrieving meta-data is summarized in Table 1.

2.2 Research methodology

Bibliometric approaches or analyses are now firmly established as an essential component of research evaluation methodology, particularly in scientific and applied disciplines (Ellegaard and Wallin, 2015). It helps to eliminate subjective bias in qualitative literature synthesis (Nerur *et al.*, 2008) and has been widely used in the past to analyze massive amounts of bibliographic content on topics (Blanco-Mesa *et al.*, 2017), universities (Merigó *et al.*, 2019), countries (Mas-Tur *et al.*, 2019) and journals (Donthu *et al.*, 2020). Citation and co-citation analysis are two of the most commonly used bibliographic approaches for uncovering differences in the intellectual landscapes of cited sources (Kessler, 1963; Small, 1973).

Bibliometrix, VoS Viewer and Cite Space are the tools used to conduct content and network analysis and to ascertain the present state of research in this sector, as well as its focus and direction. The descriptive analysis summarizes the trend in publications and citations (Tsay, 2009). The most influential sources, articles and authors are selected based on *h-index*, *g-index* and *m-index* (Hirsch, 2005; Ding and Cronin, 2011). Keyword analysis is used to elucidate the study domain's knowledge framework, emerging patterns and evolving themes (Hu *et al.*, 2018). The conceptual structure is deduced using word-tree analysis (WTM) (Callon *et al.*, 1983). Network analysis is performed using the bibliographic coupling (B-C) principle and network centrality strength to uncover interconnected communities (Bastian *et al.*, 2009).

Steps	Filtration criteria	Excluded	Accepted
Identification	Record identified through database screening (Boolean Operator)		1,320
Screening	Filtration on the basis of the subject (Business, Economics, Econometrics, Finance, Management, Accounting and Social Science)	308	1,012
	Duplicates removed	5	1,007
Eligibility	Document Type (Article and Review)	14	993
	Publication Stage (Final)	10	983
	Language criteria (English)	20	963
Included	Based on the content	20	943

Note(s): No restrictions on the ranking of Journals were made for meta-data selection
Source(s): Authors' own work

Table 1.
PRISMA flow diagram

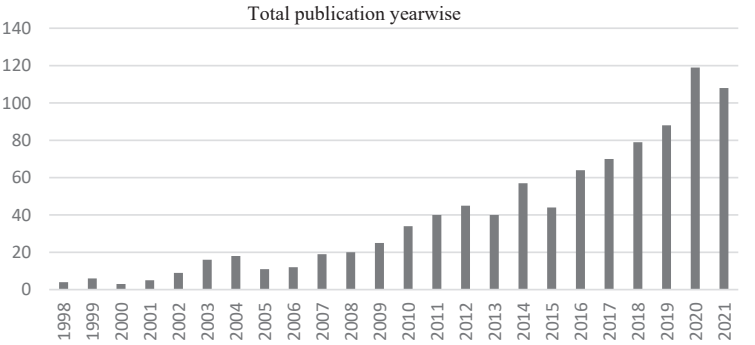
3. Descriptive statistics

3.1 Trend in research and scientific productivity

Addressing RQ1 on the research trend in passive investment, Figure 2 shows that the number of annual publications has been increasing since 2007. To be specific, over 90% of the literature included in this study was published after 2008, implying that the majority of intellectual debates in the area of passive investment occurred in the aftermath of the 2008–2012 global economic crisis.

3.2 Most influential authors, documents and sources

This section addresses the RQ2 concerning the prominent authors, articles, and sources in the field of Passive Investing. Table 2 summarizes the most influential authors on passive investing, arranged by the number of publications; additional metrics are included in the table. Tse Y is ranked first with 14 articles between 1998 and 2001, an h-index of 9, and 241 citations. Gruber MJ is the most prominent author on passive investing, with a TC count of 1,520, followed by Irwin SH (TC: 776) and Elton EJ (TC: 667). The h-index metric measures both citation and productivity impact at the author level; Irwin SH, with an h-index of 10, g (12) and m (0.833), is the most influential author in the field of passive investment, followed by Tse Y (9, 14 and 0.474).



Source(s): Authors' own work

Figure 2.
Annual scientific production

Author	*H*	*g*	*m*	TC	NP
Tse, Y.	9	14	0.474	241	14
Irwin, S. H.	10	12	0.833	776	12
Gruber, M. J.	8	11	0.242	1,520	11
Elton, E. J.	7	10	0.212	667	10
Sanders, D. R.	8	9	0.667	643	9
Frino, A.	6	8	0.286	178	8
Rompotis, G. G.	5	8	0.357	72	8
Ivanov, S. I.	4	7	0.364	80	7
Lee, C. C.	3	6	0.429	38	7
Xu, L.	3	5	0.6	32	7

Note(s): The table above enlists the top 10 authors contributing to the extant literature based on three distinct impact factors: h-index, g-index and m-index (*h*, *g* and *m* respectively). It also presents the total citation count (TC) accredited to the author along with the number of papers (NP) by the author

Source(s): Authors' own work

Table 2.
Most influential authors on passive investing based on three impact factors

As assessed by NP, Table 3 summarizes the top journals in the field of passive investment. The *Journal of Portfolio Management* tops the list with 35 contributions to the current body of knowledge, followed by Managerial Finance (NP: 28) and the *Journal of Banking and Finance* (NP: 25). It's worth noting that the top ten journals account for more than a quarter (26%) of the papers examined in this study, while the top twenty journals account for almost 40% of the total articles examined. While the Journal of Banking and Finance is the most widely cited source in the domain of passive investment, according to the *h* and *g* indexes (14 and 23 respectively), the Journal of Finance (not included in the table below) ranks first with 1,684 citations using TC as a measure of influence. Publications in reputable journals demonstrate the study domain's growth, inspiring additional research endeavors (Acedo *et al.*, 2006). The aforementioned considerations, hence, justify the remarkable increase in research in this area.

Based on the citation score, Table 4 presents the most influential papers and references on passive investing. Local citations (LCs) are based on a dataset included in the study, whereas global citations (GCs) are based on a large dataset available on Google Scholar and Web of Science. The top most influential article (GC:853) is Gruber J.'s "*Another Puzzle: The Growth in Actively Managed Mutual Funds*" (1996), followed by Shleifer A.'s "*Do Demand Curves for Stocks Slope Down?*" (1986) (GC: 589). Using LC as a metric of influence, Elton J., "*Spiders: Where Are the Bugs?*" (2002) ranks first (LC:71), followed by GruberJ., "*Managed Mutual Funds*" and Ben-David *et al.* (2018) "*Exchange-Traded Funds*" (LC: 49).

3.3 Most dominating themes in research on passive investing

In response to RQ3, Figure 3 offers an overview of the thematic evolution seen in the literature on passive investing. The frequency with which keywords appear in the literature from 1998 to the current day is used to extract the most prominent themes. Time slices were created using significant economic events that affected the development of financial markets in

Source	*H*	*g*	*m*	TC	NP
Journal of Portfolio Management	12	21	0.500	498	35
Managerial Finance	7	9	0.269	125	28
Journal of Banking and Finance	14	23	0.467	555	25
Journal of Asset Management	6	11	0.462	137	19
Journal of Index Investing	1	1	0.250	5	4
International Review of Financial Analysis	7	11	0.500	129	15
Investment Management and Financial Innovations	4	7	0.250	58	11
Journal of Futures Markets	7	13	0.368	184	15
Financial Analysts Journal	9	16	0.346	311	16
Journal of Alternative Investments	3	6	0.231	120	6
Applied Economics	5	9	0.263	94	9
Applied Economics Letters	5	7	0.417	63	11
Financial Review	8	11	0.444	210	11
Journal of Empirical Finance	7	10	0.389	366	10
Quantitative Finance	4	10	0.333	156	10
North American Journal of Economics and Finance	5	8	0.625	69	11
Review of Financial Studies	7	11	0.412	376	11
Journal of Financial Markets	8	11	0.471	261	11
Journal of Wealth Management	3	4	0.273	22	7
Applied Financial Economics	6	10	0.300	129	10

Note(s): The table above enlists the top 20 sources ranked in the order of number of papers (NP) on passive investing along with total citations (TC). The source's impact factor measured as *h*-, *g*- and *m*-index are also mentioned in the table

Source(s): Authors' own work

Table 3. Most influential sources

Author	Title	Year	LC	GC	LC/GC ratio (%)
Elton *et al.* (2002)	"Spiders: Where are the bugs?"	2002	71	105	67.62
Gruber (1996)	Another Puzzle: The Growth in Actively Managed Mutual Funds	1996	49	853	5.74
Ben-David *et al* (2017)	Exchange-Traded Funds	2017	49	41	119.51
Ben-David *et al.* (2018)	Do ETFs Increase Volatility	2018	43	82	52.44
Hasbrouck (2003)	Intraday Price Formation in US Equity Index Markets	2003	39	229	17.03
Shleifer (1986)	Do Demand Curves for Stocks Slope Down?	1986	37	589	6.28
Delcoure and Zhong (2007)	On the premiums of iShares	2007	36	52	69.23
Tse and Martinez (2007)	Price discovery and informational efficiency of international iShares funds	2007	31	52	59.62
Poterba and Shoven (2002)	Exchange-Traded Funds: A New Investment Option for Taxable Investors	2002	30	71	42.25

Table 4.
Most influential articles

Note(s): Table above enlists the top 10 cited documents on passive investing along with the local citations (LC) and Global citations (GC), author(s) and year of publication for the respective documents
Source(s): Authors' own work

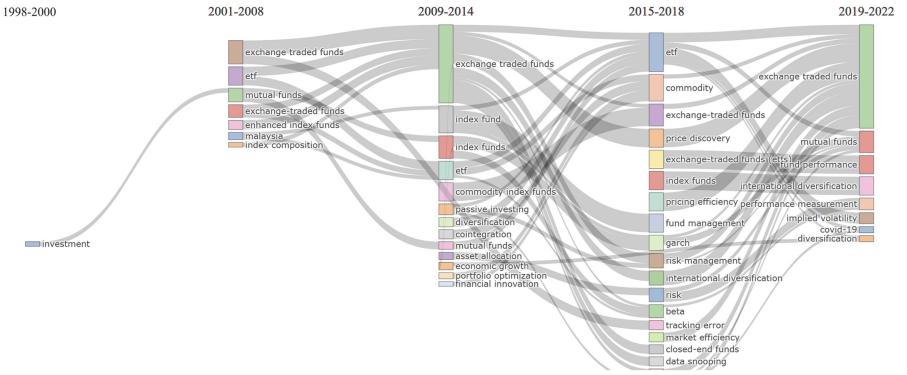


Figure 3.
Thematic evolution in passive investing research

Note(s): Figure 3 presents the thematic evolution of research in the area of passive investing across four time slices, the frequency of occurrence is the qualifying criteria for the ranking of themes
Source(s): Authors' own work

general and passive investments in particular. The first time slice, from 1998 to 2000, illustrates the closed character of financial investments before the US IT boom. With the turn of the twenty-first century and the integration of financial markets, *exchange-traded funds* and *enhanced index funds*, which seek to boost the returns produced by strict index funds, were added to the broader basket of passive investments, which index funds previously dominated. The rapid post-global financial crisis (GFC) economic recovery of the Malaysian economy [1], bolstered by robust government spending and the strengthening of foreign trade, attracted the research community's attention, as evidenced by its inclusion in the prominent themes in the period spanning 2001–2008. Passive investments experienced

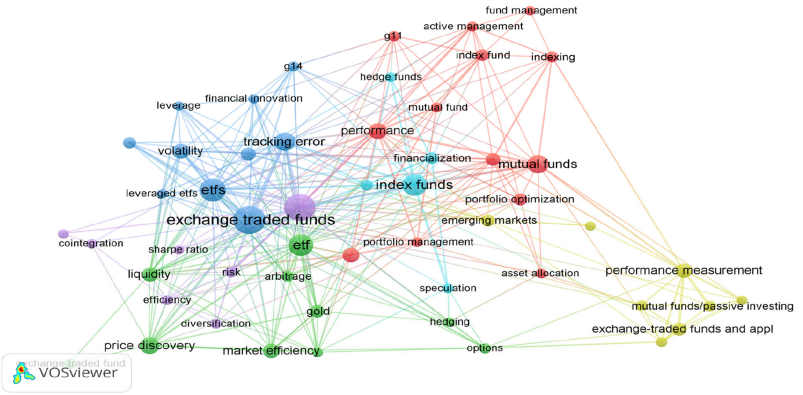
substantial growth in the aftermath of the GFC of 2007–2008, gaining extensive academic interest with the addition of *commodity index funds*, *financial innovations* and *asset allocation* to its repertoire. The increased availability of soft liquidity after quantitative easing (QE) has resulted in developing economies emerging as favored investment destinations. This development provides further rationale for the inclusion of *diversification* in the most prolific themes, alongside *portfolio optimization*. Additionally, heightened risk management awareness is a consequence of the GFC; as a result, international investors have redirected their attention toward attaining *international diversification* via ETFs that replicate global indices. The aforementioned developments have also prompted the incorporation of *TE* and *pricing efficiency* metrics into ETF performance evaluations, the implementation of *data snooping* and *GARCH* to identify patterns and the rise of leveraged ETFs (LETFs) as a novel concept in passive investing from 2015 to 2018. In 2019, asset markets experienced significant disruption and dislocation following the outbreak of COVID-19, the deadliest threat of the century. The fourth time slice commenced in that year. As a consequence, investigations into *implied volatility* in *performance evaluation, price discovery, portfolio construction* and other ETF-related studies were augmented to incorporate the quintessential *COVID-19* perspective. As environmental and sustainability concerns have grown, environmental, social and governance (ESG) orientation has emerged as a prevalent topic in passive investment research and a popular catchphrase.

4. Empirical findings

This section elaborates on the conceptual and intellectual framework of the existing literature concerning RQ4. It accomplishes this by employing a range of methodologies, including keyword analysis, B-C, keyword co-occurrence and content analysis, to identify key clusters of scholarly work in the domain of passive investing.

4.1 Network visualization of the literature

4.1.1 Keyword network analysis. In the form of a keyword co-occurrence network of the top 53 terms, Figure 4 depicts the conceptual structure of the scientific literature under investigation. Six clusters make up the network. The top cluster has 25% of all frequently co-occurring keywords in the literature, whereas the second and third clusters have 19% of all co-occurring keywords. While the fourth, fifth and sixth positions, respectively, contain 15, 13



Source(s): Authors' own work

Figure 4.
Keywords co-occurrence network

and 9% keywords. Each keyword is a node, the size of which is determined by its frequency of occurrence. The terms "exchange-traded funds," "tracking error," "index funds," "mutual funds," "performance measurement," "exchange-traded funds" and "etf" dominate in terms of network strength, implying the most prolific empirical themes in passive investing research.

4.1.2 Bibliometric content analysis of the network. Figure 5 shows the network illustrating the B-C of the top 251 articles. The network comprises nine clusters, each of which contains articles with a minimum of ten citations. The first three clusters represent more than half of all articles examined for the B-C, whereas the first five clusters represent more than 70% of all articles. The top three most popular articles in each cluster are listed in Table 5, sorted by page rank (Ding, 2011).

4.1.3 Clusterwise content analysis. With the arrival of the Science Citation Index (SCI) on the bibliographic landscape, the technique of analyzing vast scientific literature on the basis of the relationship between published papers (measured by co-referencing) has garnered huge research interest (Martyn, 1964). The B-C combined with the cluster method could provide valid depictions of the interrelationship between articles with similar referencing (Kessler, 1963). This section gives a clusterwise depiction of research in passive investing.

Cluster 1: active funds vs passive funds

The first cluster consists of 44 studies conducted from 1996 to 2019. The cluster's overarching theme is the comparative performance assessment of active funds with index funds and other passive benchmarks. The cluster is founded on the work of Gruber (1996), a research that compared active and passive funds and casts doubt on active mutual funds' meteoric expansion despite delivering lackluster performance on average (Moore *et al.*, 1999). The empirical inquiry is complemented by Elton *et al.* (1996)'s discussion of the persistence and predictability of risk-adjusted returns and fund flows as also how modern portfolio theory may be used to construct optimal portfolios generating economically significant expense-adjusted returns. The performance differential between active and passive funds (primarily index funds) has been examined from a variety of perspectives, including portfolio allocations (Keim, 1999; Baks *et al.*, 2001; Ahmed and Nanda, 2005; Bollen and Busse, 2006; Gil-Bazo and Ruiz-Verdu, 2009; Choi *et al.*, 2010; Cuthbertson *et al.*, 2010) and, non-portfolio differentiators such as fund fee expense, cash flows, trading costs and the fund management (Baks *et al.*, 2001; Gastineau, 2004; Golec, 2003; Hortacsu and Sveyorson, 2004; O'Neal, 2004; Houge and Wellman, 2007; Rompotis, 2009; Elton *et al.*, 2012; Bogle, 2014; Cremers *et al.*, 2016). Numerous studies have investigated anomalies such as in fund flows (Białkowski *et al.*, 2013) and fund

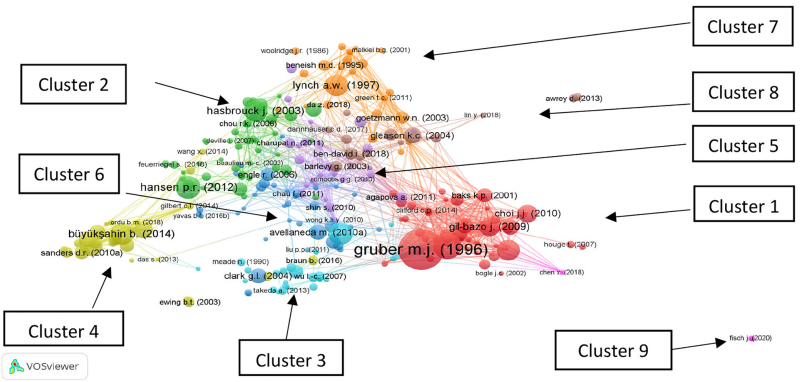


Figure 5.
Bibliographic coupling of documents (by number of citations)

Source(s): Authors' own work

Author	Title	Cluster	TC	PY	PR
Hortacsu and Syverson (2004)	Product differentiation, search costs and competition in the mutual fund industry: a case study of s&p 500 index funds	1	217	2004	1.44
Gruber (1996)	Another puzzle: the growth in actively managed mutual funds	1	853	1996	1.41
Elton *et al.* (1996)	The persistence of risk-adjusted mutual fund performance	1	336	1996	0.81
Hasbrouck (2003)	Intraday price formation in US equity index markets	2	229	2003	2.1
Elton *et al.* (2002)	Spiders: where are the bugs?	2	105	2002	1.98
Hansen *et al.* (2012)	Realized Garch: a joint model for returns and realized measures of volatility	2	265	2012	0.58
Clark and Hebb (2004)	Pension fund corporate engagement: the fifth stage of capitalism	3	112	2004	0.55
Avellaneda and Lee (2010)	Statistical arbitrage in the us equities market	3	123	2010	0.31
Malkiel and Radisich (2001)	Reflections on the EMH: 30 years later	3	93	2005	0.29
Irwin and Sanders (2012)	Testing the masters' hypothesis in commodity futures markets	4	152	2012	1.52
Büyükşahin and Robe (2014)	Speculators, commodities and cross-market linkages	4	229	2014	0.97
Irwin and Sanders (2011)	Index funds, financialization and commodity futures markets	4	211	2011	0.94
Madhavan (2012)	Exchange-traded funds, market structure and the flash crash	5	63	2012	0.91
Charupat and Mu (2011)	The pricing and performance of leveraged exchange-traded funds	5	52	2011	0.68
Agapova (2011)	Conventional mutual index funds versus exchange-traded funds	5	62	2011	0.6
Gasbarro *et al.* (2007)	Stochastic dominance analysis of ishares	6	48	2007	1.22
Fong *et al.* (2005)	International momentum strategies: a stochastic dominance approach	6	92	2005	1.07
Ippolito (1989)	Efficiency with costly information: a study of mutual fund performance, 1965–1984	6	255	1989	0.6
Goetzmann and Massa (2003)	Index funds and stock market growth	7	79	2003	1.51
Lynch and Mandenhall (1997)	New evidence on stock price effects associated with changes in the s&p 500 index	7	232	1997	0.92
Beneish and Gardner (1995)	Information costs and liquidity effects from changes in the dow Jones industrial average list	7	59	1995	0.39
Ben-David *et al.* (2018)	Do etfs increase volatility?	8	82	2018	4.34
Goetzmann and Massa (2002)	Daily momentum and contrarian behavior of index fund investors	8	70	2002	0.47
Gleason *et al.* (2004)	Analysis of intraday herding behavior among the sector etfs	8	129	2004	0.32
Chen and Scholtens (2018)	The urge to act: a comparison of active and passive socially responsible investment funds in the United States	9	13	2018	1.87
Fisch *et al.* (2019)	The new titans of wall street: a theoretical framework for passive investors	9	14	2020	1.55
Bebchuk and Hirst (2020)	The specter of the giant three	9	13	2019	1.24

Note(s): The table lists the most prolific top 3 articles of the nine bibliographic clusters created on the basis of total citations (TC). PageRanks (PR) are used to rank the articles. Publishing year (PY) and First Author name are also mentioned in the table

Source(s): Authors' own work

Table 5.
Most prolific articles on passive investing

manager names (Kumar *et al.*, 2015). Brown *et al.* (2007) and distribution channels found no conclusive evidence of underperformance relative to index funds (Guercio and Reuter, 2014). The cluster also covers quintessential comparative performance assessment studies. Lettau and Madhavan (2018) conducted an in-depth examination of the structure and organization of ETFs and various advantages offered by them with a brief reference to the disadvantages arising from market frictions. Kostovetsky (2003) discovered that ETFs are more suitable for long-term investors and that flows to ETFs are determined by individual investor characteristics and risk tolerance (Clifford *et al.*, 2014; Mikhaylov *et al.*, 2019). Deviations from the underlying benchmark, TE, its determinants and persistence have been the most researched dimension in ETF studies (Frino *et al.*, 2004; Gastineau, 2004). Blitz *et al.* (2012) expanded the analysis to include Emerging Market Economy (EME)-focused ETFs and reported much higher TE in ETFs with a developed economy focus. Notably, ETFs deliver on their underlying objective of tracking indexes and the addition of active components adds no value to ETFs Sherrill *et al.* (2017).

Cluster 2: effect of market structures

The second cluster consists of 43 publications published between 2002 and 2019. The cluster's major focus is *price formation, price discovery, market structure, and its effect on volatility and liquidity*, with ETFs as the dominant investment type. Except during periods of extreme volatility, the contribution of ETFs tracking the broad market is considerable in a complex financial market environment comprised of equity indexes, ETFs and micro future contracts (Hasbrouck, 2003; Tse and Erenburg, 2003; Chen *et al.*, 2016; Chen and Tsai, 2017). The role of spot market dynamics in comparison to futures markets has been extensively studied, and it has been determined that the introduction of small tick sizes (Beaulieu *et al.*, 2003; Wu *et al.*, 2007; Chen and Gau, 2009), market microstructure and fragmentation (Hendershott and Jones, 2005; Tse *et al.*, 2006) are economically significant. Before the introduction of computerized trading, the futures markets dominated the process of price discovery (Schlusche, 2009). Notably, ETFs now enabled by in-kind creation and redemption activity in the stock market are now leading price discovery in commodity markets (Ivanov, 2013). Increasing institutional ownership and algo-trading using high-frequency data is further aiding the price discovery mechanism (Elton *et al.*, 2002; Charupat and Miu, 2011; Chen *et al.*, 2016; Nugroho, 2021). Volatility measurement both before and after the introduction of ETFs (Hansen *et al.*, 2012) has been another frequently researched dimension, as has market fragmentation. Volatility-return relationship (Daigler *et al.*, 2014), volatility spillover and leverage effects on returns (Chen and Huang, 2010; Krause and Tse, 2013; Dedi and Yavas., 2016), as well as return predictability (Shynkevich, 2016) have been the subject of research under numerous studies. While modeling ETF returns, multiple realized volatility measures outperform single realized volatility measures, and when multiple forecasting approaches are compared, algorithmic methods and Bagging (Bootstrap aggregation) are found to be more accurate (Brownlees *et al.*, 2011). The impact of the advent of these modern trading platforms on price variations, price formation and liquidity in the ETF market, particularly with an EME concentration, remains an open subject of intellectual dispute.

Cluster 3: ETF as an investment alternative

The third cluster contains 41 publications published during 17 years beginning in 2002. The cluster's major issue is the *ETFs as an investment alternative*, with a particular emphasis on trading strategies for passive investing. ETFs combine the characteristics of closed-end funds (CEFs) and open-end funds (OEFs) (Harper *et al.*, 2006). While CEFs and ETFs are similar in terms of trading and organization, liquidity and arbitrageability set these apart (Hughen and Mathew, 2009). Both fund types overreact to domestic results; however, ETFs

more closely track the underlying index (Aber *et al.*, 2009). The gap between the net asset value (NAV) and ETF price, indicating pricing efficiency can be explained by measurement errors. However, the rate of error correction is faster in domestic ETFs compared to international ETFs with implications on portfolio diversification (Jares and Lavin, 2004; Engle and Sarkar, 2006). Price deviation (premium/discounts) has been a subject of continual investigation in ETF research; ETFs are more likely to trade on a premium basis than on a discount basis. Delcoure and Zhong (2007) argue that factors such as institutional ownership, bid-ask spread, trading volume, currency volatility, geopolitical crisis and conditional correlation between markets contribute to the formation of iShare premiums. Trading methods based on passive investments are a major focus of research in this cluster. Avellaneda and Lee (2010) examined the efficacy of model-driven statistical arbitrage and determined that strategies based on exchange-traded funds yielded a higher Sharpe ratio. Cross-border spillovers (Lee and Chen, 2020), serial dependence in returns (Baltussen *et al.*, 2019), feedback trading (Chau *et al.*, 2011) and the use of ETFs to capitalize on industry and country momentum have all been examined to determine the international diversification benefits that passive investments may provide. While ETFs have a reduced average bid-ask spread (Andreu *et al.*, 2013), index funds provide greater diversification benefits due to their lower correlations with the underlying index (Khorana *et al.*, 1998). Individual investors can easily include carry-trading into their asset allocation strategy through the use of ETFs (Das *et al.*, 2013). Gold ETFs and other index funds tracking Gold offer hedging and safe-haven features (Pullen *et al.*, 2014). Leveraged exchange-traded funds (LETFs) are the most sophisticated ETF concept. However, when Gold is used as the underlying, these exhibit tracking incapability (Leung and Ward, 2015). By and large, LETFs underperform static strategies and are regarded as unsuitable for long-term investors (Avellaneda and Zhang, 2010). The role of behavioral characteristics or investor sentiment in ETF and index fund mispricing presents future research opportunities.

Cluster 4: pricing and market efficiency

The fourth cluster consists of 28 studies that span 16 years, from 2002 to 2018. With commodities at the center of the argument, research in this cluster examines the *impact of passive investment on future prices, risk premia, market efficiency* and EMH testing. Index funds have long been blamed for increasing volatility, distorting price relationships and fueling asset commodity price bubbles (Sanders *et al.*, 2010). Empirical studies examining the relationship between index fund positions and commodity futures prices, however, found no conclusive evidence of index fund positions' impact on returns and volatility (Capelle-Blancard and Couibaly, 2011; Stoll and Whaley, 2011; Hamilton and Wu, 2015), Büyükşahin and Robe (2014) reported similar results during periods of market stress. A novel study by Gilbert and Pfuderer (2014) provided greater evidence that changes in index positions offer prognostic information for commodity prices. The financialization of commodities results in the blurring of the distinctions between commodities and stock markets (Michał Falkowski, 2011). Ordu *et al.* (2018) cited variables such as currency appreciation, availability of liquidity and the expansion of developing markets contribute to the increased volatility in raw and soft commodities markets. This problem has also been discussed with the risk premia accessible to commodity investors. Main *et al.* (2018) assert that before and after financialization, the average unconditional return on individual commodity futures markets is equal to zero.

Cluster 5: market regimes and pricing

The fifth cluster has 26 articles spanning eight years from 2010 to 2020. This cluster's central theme is *market structure, market niches and the effect of various market regimes* on the performance and pricing efficiency of passive investments. The 2010 flash crash served as a

proving ground for a variety of economic theories. Madhavan (2012) revealed that market fragmentation was a significant factor in the propagation of the liquidity shock and how securities were affected by the flash crash. Price deviations and mispricing in ETFs have been thoroughly researched since then across a range of market environments. While Wong and Shum (2010) concluded that ETF returns are not proportionate to volatility, Shanmughama and Zabiulla (2012) discovered a substantial variation in alpha generation between bearish and bullish markets, with TE and average premium being larger in bearish conditions and vice versa. As markets become more integrated, the changing market dynamics have been a continuing source of inquiry. Petajisto (2017) found that funds that invest in overseas or illiquid equities experience more price variations. Ackert and Tian (2008) assert that when country ETFs' fund premiums are compared to US ETFs' fund premiums, country ETFs demonstrate a high degree of positive autocorrelation. Their undervaluation is a result of scale effects, momentum, and illiquidity. In the Asian markets context, Shin and Soydemir (2010) found greater persistence in TEs, with currency rates playing a substantial role in the failure to track along with commonly cited market liquidity factor (Osterhoff and Kaserer, 2016; Camilleri *et al.*, 2020). On the other hand, Charteris *et al.* (2014) provide compelling evidence that ETF premiums and discounts encourage feedback trading in EMEs, which becomes more prevalent as premiums rise. LETF is a derivative-based exchange-traded fund that seeks daily returns that are a multiple of the underlying index's return. According to Tang and Xu (2013), market frictions and inefficiency greatly contribute to the LETF's return deviation. On the other hand, Li and Zhao (2014) examined how LETF trading affects the market quality of component stocks and reported a positive correlation between the trading volumes of the LETF and the stocks. ETFs have attracted enormous investor interest, making them one of the most significant financial innovations. Empirical research has discovered a strong correlation between Information and Communications Technology (ICT) penetration and ETF popularity and adoption as an investment class. The dark side of financial innovation in the domain of high-frequency data, algorithmic trading and information diffusion, on the other hand, remains a relatively untapped field of study.

Cluster 6: portfolio strategies

This cluster includes 26 studies that examine portfolio construction and optimization methodologies for passive investing. The cluster dates back more than three decades, with Ippolito (1989) providing the first evidence of the efficiency of costly information in mutual fund returns consistent with optimal trading in efficient markets. Numerous studies found that portfolios constructed using stock-specific criteria (Meade and Salkin, 1990), diversity-weighted index (Fernholz *et al.*, 1998), enhanced index investing (Wu *et al.*, 2007) and heuristics (Takeda *et al.*, 2013) generated higher returns than portfolios constructed using the market capitalization method. Estrada (2008) demonstrated that low-cost value-based strategies outperformed both price-insensitive passive and capitalization-based indexes in global portfolio building. Thompson *et al.* (2006) conducted exploratory data analysis and found data-driven programming to be superior to the several fundamental models of neoclassical computational finance. In the ETF context, numerous studies found that ETFs provide fewer diversification benefits than implied by the benchmark index's return characteristics (Bhattacharya *et al.*, 2017; Buetow and Henderson, 2012; Pedersen, 2018). Huang and Lin (2011), on the other hand, concluded that ETFs have a higher Sharpe ratio than the target market index, particularly in EMEs. With growing awareness of the interdependence of ESG challenges, sustainable investment has gained traction, allowing investors to benefit from investing in ETFs tracking firms with sustainable development goals (Miralles-Quirós and Miralles-Quirós, 2019). Analyzing hedge strategies based on

restricted passive portfolios, smart beta strategies, alternative energy and ESG investment in general gives further scope for research.

Cluster 7: varying composition of underlying indices

A total of 24 studies examining *changes in the composition of broad market indices* such as the S&P 500, the Russell 2000, the FTSE100, and the DJIA, as well as the associated price effects, form the heart of this cluster, which spans over 2 decades (1994–2018). Index funds, ETFs and other passive funds collectively represent a sizable and important institutional investor class for stocks trading on global stock markets. Any change in the composition of the larger indices tracked by index funds and ETFs causes rebalancing of index fund portfolios and so affects returns (Shleifer, 1986; Lynch and Mendelhall, 1997; Chen *et al.*, 2006), providing vital insight into market efficiency (Madhavan, 2003). This effect could be transient, consistent with the price pressure hypothesis (Woolridge and Ghosh, 1986; Vespro, 2006), or it could be permanent, consistent with Scholes's (1972) price shift followed by considerable abnormal trading volume, confirming downward-sloping demand curve hypothesis (Biktimirov, 2004). Beneish and Gardner (1995) suggested that information symbolism, price pressure, imperfect alternatives and information cost could all be explanatory variables for the stock market consequences of DJIA revisions. On the other hand, Malkiel and Radisich (2001) find no evidence that indexing has a persistent effect on the pricing of securities. According to Masse *et al.* (2000), the information content of inclusion does not fully explain the share price response. Numerous studies examined the effect of changes in the composition of market benchmarks on stock betas (Hau, 2011), the liquidity provision of index funds (Green and Jame, 2011), the demand for component stocks (Kappou *et al.*, 2010), and the home currency (Hau *et al.*, 2010). On the day of index inclusion, NYSE equities saw less severe price effects than NASDAQ stocks, demonstrating the superiority of the expert system over the dealer system in minimizing price effects (Elliott and Warr, 2003).

Cluster 8 and 9: contribution of passive investments to market volatility

This cluster focuses on the *impact exerted by passive investments on market volatility*, which is fueled by both misguided investor decisions and ETF market action driven by arbitrage. This cluster is comprised of 17 articles dating from 2002 to 2018. Herding behavior has been extensively studied during periods of market stress and volatility, and momentum flows during these periods are significant for securities pricing (Goetzmann and Massa, 2002). Investor behavior, on the other hand, is not symmetrical between bull and bear markets (Gleason *et al.*, 2004; Gopane *et al.*, 2023). Stocks with a higher proportion of ETF ownership exhibit much more volatility, which adds another layer of non-diversifiable risk to stock prices (Ben-David *et al.*, 2017). Increased ETF ownership is accompanied by increased trading costs, diminished information acquisition benefits, and an increase in voluntary disclosures (Israeli *et al.*, 2017; Schoenfeld, 2017; Lin *et al.*, 2018). ETFs, hedge funds and other institutional investors provide aggressive liquidity at competitive prices (Aitken *et al.*, 2007). Index funds have been implicated in causing the asset price bubbles and ensuing financial crisis. With the growing popularity of passive investing, the situation is likely to deteriorate further due to increased financialization via ETFs and high-speed automated algorithmic trading, as well as accumulating unfunded obligations (Sornette and Cauwels, 2014). However, the magnitude of the crash is highly dependent on the proportion of uneducated investors and the amount of unsophisticated passive investing in the market (Barlevy and Veronesi, 2003). The effect of stock inclusion in ETFs on price correlation and stock betas remains largely unknown in the EME environment, despite rising cross-sectional commonality in equities. This also highlights the importance of developing innovative risk management solutions.

Nineth cluster is the smallest cluster, consisting of three publications that make significant contributions to the literature on the dynamic role of passive investments in global financial markets. With the growing popularity, passive investments account for a sizable portion of the total AUM in the developed markets. These funds are ready to amass massive positions as their combined ownership in the most widely followed broad indices such as the S&P 500 and DJIA continues to grow at a breakneck pace (Bebchuk and Hirst, 2019). Three mega-funds in the United States control more than 40% of voting rights in companies listed on S&P and dominate the broader index. Their full potential is anticipated to manifest itself in the shift to sustainability, with passive management eclipsing active fund management in socially responsible investing (Chen and Scholtens, 2018; Fisch *et al.*, 2019). The extent to which passive funds contribute to ESG objectives remains an unanswered question.

4.2 Conceptual analysis

The conceptual model illustrated in Figure 6 summarizes a thorough content study of the literature in nine bibliographic clusters. The structure largely illustrates the various antecedents of passive investments and their impact on two major performance attributes, with liquidity, degree of financialization and capital flows serving as mediating factors. Bi-directional arrows suggest potential endogeneity in financial variables, while the link denotes the nature of the relationship studied in the available literature.

The investors' rationale for choosing active funds despite their historical underperformance in comparison to passive benchmarks and index funds has been constantly scrutinized (Goetzmann and Massa, 2003; Lichtenstein *et al.*, 1999; Fortin and Michelson, 2005; Boldin and Cici, 2010). Passive funds are intended to replicate a market-linked benchmark, and deviations from the benchmark define tracking efficiency (Johnson, 2009; Chu, 2011; Rompotis, 2011). Transitions in the macroeconomy dictate market regimes. Furthermore, market volatility is substantially influenced by corporate actions, including investor disclosures and expanding ICT penetration. Expansionary developments tend to generate more pronounced surges, as forecasting errors escalate (Lunde and Zebedee, 2009; Nguyen *et al.*, 2007; Aggarwal *et al.*, 2014). The market for passive investments reflects the cumulative impact of these forces in three broad dimensions: Market liquidity, Capital Flows and Degree of Financialization. Although the term "financialization" began to appear with increasing frequency in the early 1990s, its origins remain elusive. However, since the late 1960s, the fundamental issue of a gravitational movement toward finance in capitalism as a whole has existed. Financialization essentially implies the increasing role of financial motives, financial markets, financial actors, and financial

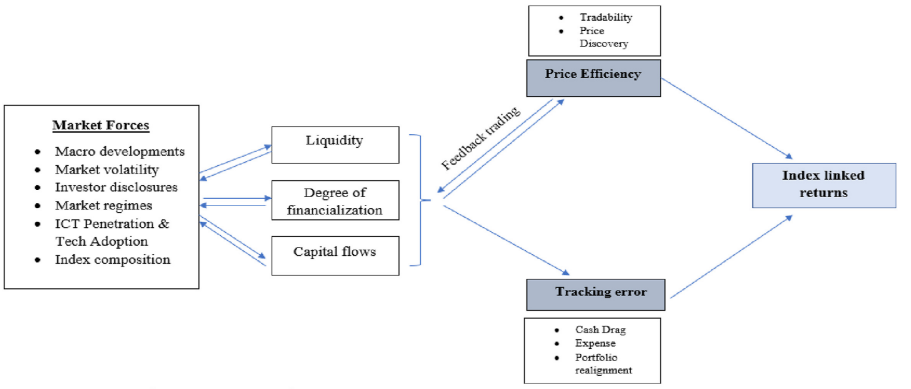


Figure 6.
This figure represents the conceptual structure developed based on analysis of the content of passive investing literature

Source(s): Authors' own work

institutions in the operation of domestic and international economies. This equally holds for passive investments.

ETFs, the most popular passive alternative, allow for secondary market trading. Authorized participants' in-kind redemption and creation processes result in price discovery in ETF markets, defining the pricing efficiency (Shanmughama and Zabiulla, 2012; Petajisto, 2017). The market's liquidity (Ackert and Tian, 2008), as well as overall volatility, determine the success of in-kind creation and redemption processes, thereby influencing the degree of financialization (Irwin and Sanders, 2011, 2012; Michał Falkowski, 2011; Ivanov, 2013). With the financial markets landscape evolving, contemporary issues such as the impact of ICT and social change on ETF performance (Lechman and Marszk, 2015), international diversification (Huang and Lin, 2011) and emerging economies perspectives (Blitz *et al.*, 2012) have become research focal points. Passive investments are gaining popularity and are establishing a dominant position as a source of investible surplus. ETFs have been instrumental in reducing market volatility (Lin and Chiang, 2005) and increasing liquidity (Hegde and McDermott, 2004; Ben-David *et al.*, 2017), and are now the primary source of price discovery (Ivanov, 2013), resulting in long-term convergence of stock betas (Sullivan and Xiong, 2012). Madura and Ngo (2008) concluded that ETFs had a sizable and beneficial effect on the valuation of their constituent equities. Petajisto (2011) coined the term "index turnover cost" to examine the effect of ETF price deviations on investment behavior. Charteris *et al.* (2014) concluded that ETF discounts/premiums encourage feedback trading, whereas Da and Shive (2018) concluded that correlations between ETF returns and stock-lagged beta provide evidence for price reversal. This also reflects the endogeneity of variables such as liquidity, capital flows and financialization degree.

5. Limitations

While the study contributes significantly to the field of knowledge, it has several limitations that must be considered when interpreting its findings and implications. With our emphasis on academic journals, the study analyzed only peer-reviewed journal articles, excluding conference papers, reports, and technical articles. As a result, contributions published in other formats that had an effect on the body of knowledge are excluded. Additionally, our keyword-based approach to article selection may introduce subjectivity bias into the process. While we are confident that our approach resulted in a comprehensive and representative database, our reliance on Elsevier Scopus and Web of Science may have resulted in us overlooking relevant work that is only accessible through other databases. Additionally, specific bibliometric properties may not be time-stable, and certain common distribution patterns of the passive investing literature may still be developing. Furthermore, it is worth noting that the graphs and citation networks were interpreted subjectively. With passive investing's growing popularity and the number of publications at an all-time high, it's clear that intellectual debate in this field has not yet reached saturation. As a result, the study's findings may not be exhaustive, and there is considerable room for additional research, as detailed in Sections 6 and 7.

6. Research implications

With this study, it has been possible to observe and chart the high growth trajectory of passive investing research globally, especially post-US Subprime crisis. The phenomenal growth story of passive investments may be attributable to increasing investor dissatisfaction with active investing which comes at a higher price. The findings of our study have key implications for various stakeholders: investors, regulators and managers, these are discussed in detail below:

6.1 Implication for investors

Despite the widespread adoption of passive investing as an investment strategy, it is not a one-size-fits-all proposition. Market conditions change constantly, and it frequently requires an informed eye to determine when and how much to shift away from active investments and toward passive ones. Active managers may outperform more frequently than passive managers in volatile markets or when the economy is weakening. On the other hand, passive strategies may be preferable when the index's constituent securities move in lockstep or when stocks have more consistent valuations. Depending on the opportunity in different sectors of the capital markets, investors may gain from a combination of passive and active techniques.

While active investing may be more profitable in cases where international diversification is required, such as investing in emerging market stocks, passive investing may make more sense in the domestic investing landscape. Additionally, an active fund manager may be better suited to manage a portfolio of illiquid securities or one that is tailored toward a specific objective, such as limiting the downside risk. It's also worth noting that investors, on average, place a higher premium on risk, return and liquidity than on cost. This is especially true for those with high net worth who have access to private equity, hedge funds and other curated alternative investments. While investing in ETFs, investors should bear in mind the effect of market regimes on TE, as deviations from the benchmark typically increase more during bearish than bullish regimes. Currency ETFs enable investors to implement a carry trade strategy in their portfolios; however, as a word of caution, currency stability and liquidity can play a significant role in international ETFs. Similarly, LETFs may be better suited for dynamic strategies and offer less value to a long-term investor. Lastly, the importance of investor education cannot be underestimated in the name of the highly diversified portfolio when using passive alternatives, for which necessary efforts are required by regulators and investors alike.

6.2 Managerial implications

The inexorable trend to passive investing creates numerous issues for fund management, including fee and revenue pressure, which forces traditional managers to seek new revenue streams, such as illiquid and private assets, which also implies increased portfolio risk. Additionally, the increased transparency and efficiency associated with the ETF market indicates that managers must rethink the entire value chain, beginning with technology and the way investments interact. ETFs outperform closed-ended funds in terms of tracking ability. Both, however, exaggerate their reactions to domestic news. Index funds may be more suitable for international diversification.

According to the research, ETF discounts and premiums promote feedback trading, which may result in panic redemptions during times of market stress. Additionally, managers must develop novel risk management strategies to reduce their reliance on cash holdings, which are a major cause of portfolio TEs. This is truer than before with the more integrated character of the world economy necessitating quicker portfolio realignments as indices reel under pressure. ETFs are now at the forefront of price discovery, and managers must adopt better volatility metrics that take macroeconomic and investment disclosure factors into account. Algorithmic approaches and bootstrap aggregation (Bagging) with superior predicting abilities may prove to be more effective in this area. With increasing sustainability and environmental concerns; however, ETFs are set to overtake active funds in the fulfillment of ESG objectives.

6.3 Implications for regulators

The passive investing phenomenon has shaken the financial industry by assuming dominance on the most closely followed global indices, which contradicts the tenet of

diversification. Passive funds are now having an impact on the creation and composition of the indices they were designed to follow, as trackers' holdings exercise significant influence over voting rights and flow momentum. Passive investments have triggered changes in market structure that are still not fully understood or factored in. Active management and a range of valuation opinions on whether a price is "too low" or "too high" provide much-needed depth to a market as it attempts to strike a delicate balance between demand and supply forces, ensuring liquidity at all price points.

Passive investments, on the other hand, have a straightforward mandate of buying on fund inflows and selling on fund outflows. If passive investments were to dominate, markets would be shallow, with liquidity available only to the extent that prices remained constant. Beyond the current price, the presence of bids and offers rapidly diminishes, increasing the risk of stocks being locked limited up/down and liquidity evaporating as price changes increase in magnitude. As previously stated, NYSE equities saw fewer price repercussions than NASDAQ equities during the index inclusion process, demonstrating the superiority of expert systems over dealer systems based on machine learning. Thus, with passive investing assuming a large role in the financial landscape, regulators will need to devise novel monitoring and discrepancy detection approaches in addition to reinstating a focus on investor education.

7. Conclusion and future scope

The study's objective is to synthesize available knowledge about passive investing and to highlight innovative advancements in this field on a worldwide scale. We analyzed 943 research publications (published between 1998 and 2021) and provided a thorough overview of the characteristics that determined the expansion of passive investment as a result of the twin benefits of diversity and low cost. The collection of studies has major managerial implications, particularly in terms of portfolio allocation, trading methods, price discovery and subsequent investment behavior. As detailed in the cluster analysis section, passive investment has become a dominant force in global financial markets, with passive funds together controlling more than two-fifths of the voting rights in the world's most widely tracked equity indices. ETFs, the most recent financial innovation in passive investing, are currently at the forefront of price discovery. With the increasing popularity of digital platforms, high-frequency trading and market interconnectedness; the impact of market regimes, microstructures and macroeconomic developments on underlying indices and stocks may define fund managers' portfolio optimization strategy. Managers must be alert and creative in weighing the costs and benefits of various options to maximize the performance of their portfolios. Furthermore, this research summarizes the available literature in terms of publication date, citations, geographic scope, intellectual environment, theories applied and research procedures. Additionally, this paper discusses some of the research issues associated with passive investing and suggests future research opportunities in this emerging field of study. Future studies pertaining to the clusters under consideration may be guided by the findings gathered in this study. The effect of contemporary trading platforms and algorithmic trading on price volatility, price formation and liquidity in ETF markets is a relatively uncharted territory within the broader category of market structures. The impact of behavioral characteristics on mispricing, future prices, risk premiums and market efficiency are all aspects that deserve attention within the pricing and market efficiency cluster. Although the number of empirically tested and generalizable studies is on the rise, further research in this area is required. Given the increasing significance of developing nations in international financial markets, there are potential areas for further academic investigation within the portfolio strategies cluster, including the impact of stock inclusions in ETFs, price correlations, stock betas and the variable composition of the indexes

tracked by these funds. Given the heightened awareness surrounding climate risk and sustainability, any discourse concerning ETFs as an alternative investment strategy must also consider the emergence of ETFs with an ESG focus. This represents a substantial aspect that merits further research, especially within the EME context.

Notes

1. The Malaysian government executed an initial monetary and fiscal stimulus package totaling RM 7 billion (USD 0.98 billion). This was succeeded by a more comprehensive stimulus package of RM 15 billion (USD 2.1 billion), which invested in locally-oriented initiatives with multiplier effects and accounted for nearly 9% of the country's GDP. In addition, tax incentives, private finance initiatives, and off-budget ventures were incorporated into the package. The stimulus package was the most comprehensive in the annals of the nation's economy and ranked second among ASEAN nations, behind only Singapore. The circumstances in Malaysia exhibited an unusual pattern, given that the worldwide financial crisis predominantly materialized as an export crisis as opposed to a currency or banking crisis. The significant repercussions were predominantly experienced inside the stock markets, resulting in a rapid outflow of portfolio investments. As a result of avoiding exposure to hazardous property asset bubbles, Malaysian banks encountered limited consequences in other financial sector domains and served as an illustrative case study of insights gained from prior crises.

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