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The evolution of retail outlet distribution: a systematic review of spatial patterns, drivers, and implications for urban development and economic growth

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The spatial patterns and evolution of retail outlet distribution are crucial to understanding urban development and economic growth. As urbanization accelerates and e-commerce continues to grow, retail landscapes worldwide are undergoing significant transformations. This study examines the evolution of retail outlet distribution in global scales, with a particular focus on the changing size and location of retail outlets across international, national, and urban scales. The primary challenge in the retail industry lies in adapting to these changes, which are influenced by various socio-economic and policy-driven factors. Despite a growing body of literature on this topic, the mechanisms behind retail evolution remain poorly understood, especially regarding how policies, consumer behavior, and technological changes shape retail spatial distribution. The objective of this study is to systematically review and analyze the historical evolution of retail outlet distribution and its driving mechanisms. A total of 7,066 articles were retrieved during the initial identification process, with 6,615 sourced from Web of Science (WoS) and 451 from Scopus. The review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria, encompassing five main steps: review protocol, formulation of research questions, identification, screening and eligibility, and quality appraisal and data extraction. The literature is analyzed through three primary themes: international, inter-city within country, and intra-city. The findings indicate that the evolution of retail distribution is closely tied to the spatial pattern of residential areas, government policies, and consumer behavior. This study highlights a significant gap in understanding the local, national, and international factors that shape retail development patterns. The implications of these findings are critical for urban planners, policymakers, and retail managers, offering insights into how retail networks can be designed more effectively, with a focus on sustainability and innovation. Future research should explore how these evolving patterns can contribute to more inclusive and balanced urban and economic growth.

KEYWORDS

economic growth, evolution, PRISMA, retail commercial, spatial pattern, sustainable business strategies, systematic literature review

1 Introduction

The retail industry plays a vital role in the socio-economic development of urban areas, closely reflecting the scale of urbanization and the consumption patterns of residents (Dunne et al., 2011). As urban populations grow and their consumption power increases, the spatial pattern and evolution of retail commercial outlets have become central topics in urban studies, with implications for economic planning, social dynamics, and policy development (Levy and Grewal, 2023; Fernie et al., 2015). Retail outlets, as core elements of urban commercial activities, not only serve as centers for consumption but also provide insight into the transformation of urban spatial structures and economic patterns (Guy, 2002). The retail industry, as a critical component of urban economies, has undergone significant spatial and functional transformations in recent decades (Getis and Getis, 1966).

Various factors have driven these changes, including rapid urbanization, evolving consumer preferences, and technological advancements (Hao et al., 2021). Retail outlets, once concentrated in city centers, are now expanding into suburban areas and beyond, spurred by strategic policies and the development of retail networks (Wang and Coe, 2021). As highlighted by researchers from Universiti Kebangsaan Malaysia (UKM), the evolution of retail distribution patterns reflects broader socio-economic trends and has implications for both urban planning and economic growth (Ahamad et al., 2022; Azmi et al., 2023; Shaharudin Bin et al., 2011; Shaharuddin Bin et al., 2010; Othman and Jaafar, 2016; Saleh et al., 2016). Moreover, e-commerce is what Rayport and Jaworski referred to in 2003 as trade in goods and services on the Internet. Its integration with physical retail spaces has become a key factor in reshaping retail strategies (Rayport and Jaworski, 2003; Nertinger et al., 2022; Goel, 2023; Kirby-Hawkins et al., 2019). This study aims to explore these trends through a systematic review of the literature, focusing on the factors driving the distribution and size evolution of commercial outlets.

The spatial organization of retail outlets, including their distribution, density, and organizational structure, is a key indicator of urban development (Baviera-Puig et al., 2016; Kickert et al., 2020). For instance, Figure 1 presents the kernel density distribution of retail outlets in the Fengtai District of Beijing, based on point of interest (POI) data collected from Gaode Map in 2023. The dataset includes all retail categories under the *Retail Trade* division as defined in the National Economic Industry Classification and Codes (GB/T 4754-2011). The data were cleaned, processed, and validated before being analyzed using ArcGIS 10.6. The kernel density estimation calculates the concentration of retail outlets per square kilometer (Benoit and Clarke, 1997; Roig-Tierno et al., 2003).

The base map was obtained from the Alibaba Cloud data visualization platform (central coordinate: 116.27915, 39.8534). The

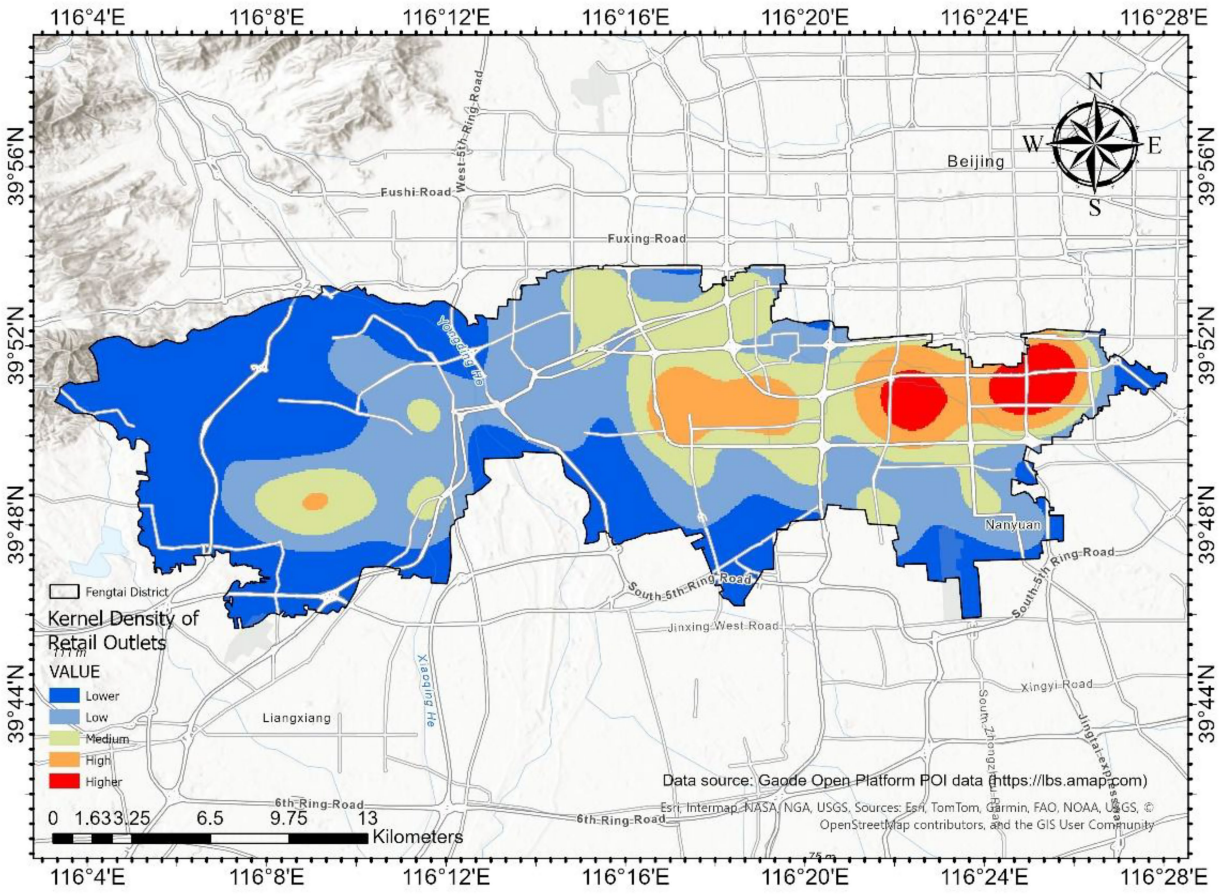

FIGURE 1
Kernel density map showing the spatial distribution of retail outlets in Fengtai District, Beijing. Values represent estimated retail outlet density per km^2.

coordinate reference system used is WGS 1984, projected with the Web Mercator projection (EPSG: 3857).

The spatial distribution of retail outlets interacts closely with urban form, manifesting in retail clusters near transport hubs, commercial centers, and high-density residential areas. This reflects broader changes in the economic landscape, influenced by urban planning, shifting consumer preferences, and the adoption of digital retail technologies (Zhang, 2008). In developed regions such as the United States, Europe, and Japan, the evolution of retail spatial structures has closely paralleled urban expansion and socio-economic change (Levy and Grewal, 2023; Guy, 2002). Retail activity has progressively shifted from traditional central business districts (CBDs) to decentralized suburban shopping malls during the post-war period, and more recently, to compact, mixed-use developments and transit-oriented retail clusters (Zhang, 2008). Furthermore, the integration of e-commerce has introduced hybrid spatial forms, blurring the boundaries between physical and digital retail environments (Rayport and Jaworski, 2003; Zhang, 2008; Burger et al., 2014; Kirby-Hawkins et al., 2019). Early studies on urban commercial location models, such as those developed by the Chicago School, laid the foundation for understanding the hierarchical and distributional patterns of urban retail systems (Yang, 2000; Guy, 2002; Hughes and Jackson, 2015).

The spatial patterns of retail outlets are shaped not only by urban planning and land-use policies but also by market forces, technological innovation, and changing consumer demands. With the rise of e-commerce, the retail landscape has witnessed a convergence of online and offline commercial spaces, introducing new complexities in spatial organization—such as the emergence of hybrid retail formats, the proliferation of last-mile delivery hubs, and the strategic placement of click-and-collect locations within urban cores (Rayport and Jaworski, 2003; Levy and Grewal, 2023; Feichtinger and Gronalt, 2021; Kirby-Hawkins et al., 2019). Recent studies on retail outlets have concentrated on analyzing urban commercial centers, hierarchical structures, and agglomeration effects, which have been crucial in understanding the dynamics of retail spatial patterns (Guy, 2002). As urbanization accelerates globally, these patterns have become increasingly multifaceted and interdisciplinary, drawing on regional economics, urban planning, and consumer behavior studies.

Technological advancements, particularly in Geographic Information System (GIS) and big data analytics, have significantly enhanced the study of spatial distributions. GIS tools have allowed for more precise and granular analysis of retail locations and their evolution over time (Benoit and Clarke, 1997; Roig-Tierno et al., 2003). Studies using point of interest (POI) data, such as those by Miao et al. (2021) in Beijing and Roig-Tierno et al. (2003) in Murcia, Spain, have provided valuable insights into urban spatial structures, focusing on the distribution and clustering of retail outlets. These methods have become indispensable in analyzing retail patterns, particularly in large cities, and have contributed to the development of location-based decision models (Hao et al., 2021). By leveraging POI data, these studies have furthered our understanding of the intricate dynamics of retail site selection, offering a nuanced view of the spatial behavior of consumers and retailers alike.

Despite the wealth of research on the spatial distribution of retail outlets in major urban centers, there remains a notable gap in the literature concerning small- and medium-sized cities. In the context of China's urban hierarchy, these typically refer to cities with a resident population of less than 1 million (small) or between 1 and 5 million (medium) (Wei, 2015; Chen, 1991). Most existing studies, such as those by Miao et al. (2021), have concentrated on first-tier cities—a term commonly used in China to denote the most economically developed and globally connected metropolitan areas, such as Beijing, Shanghai, Guangzhou, and Shenzhen (Li et al., 2022; Wei, 2015). These cities often dominate academic research due to their size, data availability, and policy prominence, while the spatial dynamics of retail development in lower-tier or less densely populated urban areas remain underexplored. These cities present unique challenges and opportunities for retail location analysis as they may exhibit distinct patterns in terms of consumer behavior, market demand, and retail clustering (Hao et al., 2021). As a result, understanding the spatial distribution of retail outlets in small- and medium-sized cities could offer valuable insights into broader urban retail trends and help refine location-based decision-making models.

Clarke (2000) emphasized the need to understand the relationship between small- and medium-sized retailers and different levels of urban development. In Clarke's study, small- and medium-sized retailers are defined in line with Organization for Economic Co-operation and Development (OECD) standards, where small enterprises typically employ 10–49 people and medium-sized enterprises 50–249 people, based on workforce size (Organisation for Economic Co-operation and Development (OECD), 2005). Recent studies by Zhang et al. (2021) have started to bridge this gap by analyzing retail evolution in southern and northern China, respectively. These studies highlight the varying dynamics of retail distribution and consumer behavior across regions with different levels of urbanization. For example, Zhang et al. (2021) explored how retail outlets in southern China have evolved in response to rapid economic growth and urban expansion, while Liu and Ma (2020) examined retail patterns in northern China. These studies contribute to a more nuanced understanding of retail evolution and demonstrate the importance of considering regional factors in retail location models. This systematic literature review aims to address significant gaps in the existing body of research regarding the spatial distribution and evolution of retail outlets in China (Yang et al., 2024; Yannan et al., 2020), with particular emphasis on the disparities between large and small cities. Two key objectives guide this review: (1) to analyze the characteristics of the spatial structure of urban retail outlets and (2) to explore the evolutionary process of retail development, focusing on the economic, social, and technological drivers that shape retail location dynamics.

2 Materials and methods

2.1 Data sources

This study employs a systematic review methodology designed to identify, evaluate, and synthesize findings from peer-reviewed studies on retail outlet distribution. The methodological framework follows best practices for evidence synthesis and is comparable to recent reviews in conservation and environmental planning that integrate spatial and policy dimensions (Németh et al., 2021; Zakharovskyi and Németh, 2021). Systematic reviews are especially useful in interdisciplinary fields for revealing emerging themes, common challenges, and research gaps.

To ensure broad disciplinary coverage and global representation, this study utilized two major academic databases: Scopus and Web of

Science. These databases are widely recognized for their comprehensive indexing of peer-reviewed journal articles across urban studies, geography, planning, and retail-related research. Their international scope, standardized metadata structure, and high academic quality make them particularly suitable for systematic reviews that explore spatially distributed phenomena. While broader platforms such as Google Scholar or regional repositories may retrieve a greater number of documents, they often lack standardized metadata, peer-review assurance, and indexing transparency. Scopus and WoS, by contrast, provide high replicability, making them well-suited for spatially comparative reviews.

2.2 Review protocol and selection process

This study adopts a systematic literature review (SLR) methodology, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. Although originally developed in medical research, PRISMA is now widely applied in urban geography and retail studies (Sarkis-Onofre et al., 2021; Ahamad et al., 2022; Azmi et al., 2023). It offers a robust framework for identifying, evaluating, and synthesizing research in a transparent and reproducible manner (Liu et al., 2022; Bonfrer et al., 2022).

To ensure comprehensive topic coverage and minimize publication bias, we systematically identified studies using two reputable databases: Scopus and Web of Science (WoS). These databases are internationally recognized for their extensive indexing of peer-reviewed literature across geography, planning, and urban studies (Gupta et al., 2022; Djeunang Mezafack et al., 2022). Keyword queries such as "retail outlet spatial patterns," "urban retail evolution," and "geographic distribution of retail" were used to retrieve relevant publications.

The selection of literature followed a structured, multi-stage protocol consistent with PRISMA guidelines. First, a total of 7,124 records were retrieved and duplicates were removed using EndNote. Titles and abstracts were screened according to predefined inclusion criteria: peer-reviewed journal articles published in English, availability of full text, and explicit relevance to retail spatial distribution. Finally, full texts were reviewed to assess methodological transparency and alignment with the research objectives. This rigorous screening process resulted in 15 studies being included in the final synthesis. While topic modeling or AI-assisted screening could offer broader coverage, the qualitative focus of this review prioritized interpretative depth over automation.

Only English-language publications were included to ensure screening consistency and accessibility of analysis. However, we acknowledge that this may introduce linguistic or regional bias, potentially underrepresenting findings from non-English-speaking regions. Future multilingual reviews could help address this limitation more comprehensively.

Although no automated selection tools were used, we adhered to a pre-established review protocol. To assess quality, we applied simplified appraisal criteria derived from Critical Appraisal Skills Program (CASP) and Standards for Reporting Qualitative Research (SRQR), focusing on empirical clarity, methodological transparency, and relevance to spatial retail research. A visual summary of the systematic review process, adapted from PRISMA logic, is presented in Figure 2, which outlines the five-phase approach adopted in this study: identification, screening, characterization, quality assessment, and data analysis.

2.3 Formulation of research questions

To ensure analytical focus and conceptual clarity in the synthesis process, research questions were developed using the Population, Interest, and Context (PICo) method, which is commonly used in qualitative and mixed-methods systematic reviews (Okoli, 2015; Gomes and Paula, 2017). This framework effectively defines the three key components of the review: the Population, Interest, and Context. In this case, the Population refers to the evolution of retail outlet distribution and size, the Interest focuses on spatial patterns, and the Context is urban retail outlets. By utilizing this structure, two main research questions were formulated to direct the focus of the review. The first question seeks to explore the evolutionary patterns of urban retail outlet distribution and size. The second question aims to identify the key factors that influence and constrain these spatial patterns. Together, these research questions serve as the foundation for analyzing the complex dynamics that shape urban retail systems, offering insights into how these patterns evolve and what factors drive or limit their development.

2.4 Systematic search strategy

The systematic search followed a structured five-step process (Okoli, 2015): identification, screening, characterization, quality assessment, and data analysis. A visual summary is provided in Figure 2.

Identification: A total of 7,066 studies were initially identified using specific keywords such as "retail outlet spatial patterns," "urban retail evolution," and "geographic distribution of retail outlets" across two academic databases, namely, Scopus and Web of Science (WoS). This ensured comprehensive coverage aligned with the study's focus.

Screening: After removing 3 duplicate records, 383 non-English studies and 2,365 publications dated before 2012 were excluded. The year 2012 was chosen as a cutoff point because the rapid expansion of e-commerce around this time significantly altered retail spatial structures, making earlier studies less relevant to current dynamics (Rayport and Jaworski, 2003; Goel, 2023; Kirby-Hawkins et al., 2019). An additional 4,090 studies were excluded after title and abstract screening as they did not directly address the spatial evolution of retail outlets. As a result, 275 studies were retained for full-text eligibility assessment.

Eligibility: Of the 275 studies retained from the screening stage, only 128 articles had accessible abstracts or full texts available for full-text review. These 128 studies were then assessed based on predefined inclusion criteria, including geographic focus, methodological rigor, and relevance to the spatial structure of retail development. As a result, 111 articles were excluded due to irrelevance or insufficient analytical depth, leaving 17 studies for final inclusion in the systematic analysis.

Quality assessment: The remaining 17 studies underwent a rigorous quality assessment to evaluate their methodological

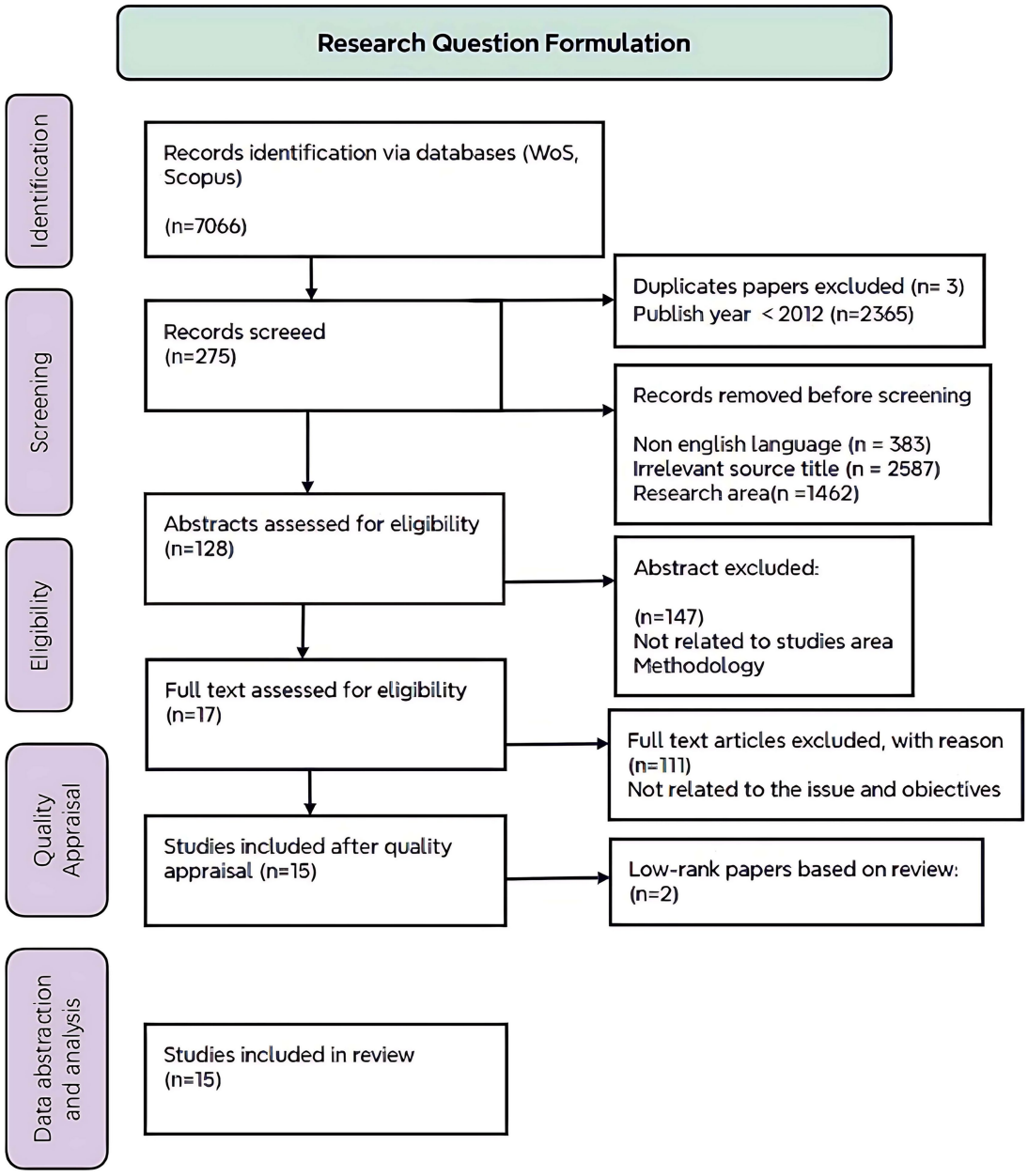

FIGURE 2
PRISMA-style flow diagram illustrating the five-stage review workflow: identification, screening, eligibility, quality assessment, and data analysis.

soundness, data reliability, and alignment with the review's objectives. Using predefined appraisal criteria, two studies were deemed to be of low quality and were excluded from the final synthesis. This step ensured that only 15 high-quality studies were included in the subsequent data analysis, thereby maintaining the credibility and robustness of the review process.

Data analysis: The final 15 studies were subjected to thematic and comparative analysis to identify prevailing trends, spatial patterns, and research gaps in the existing literature. This analysis provided critical insights into the evolution of urban retail spatial structures and contributed to a more nuanced understanding of the key drivers shaping retail outlet distribution and configuration across diverse urban contexts.

The initial search results were manually screened by two independent reviewers with expertise in urban retail geography. The title and abstract screening phase applied predefined inclusion and exclusion criteria: studies had to (1) be peer-reviewed journal articles, (2) be written in English, (3) explicitly focus on the spatial distribution or evolution of retail outlets, and (4) present empirical or methodological contributions rather than purely theoretical discussions. Any disagreement between reviewers was resolved through discussion until consensus was reached. A third senior researcher acted as an adjudicator in cases of uncertainty.

Full-text screening followed a structured protocol, considering study location, data type, analytical method, and retail typology relevance. For studies with inaccessible abstracts or full texts, exclusion

was unavoidable due to the inability to determine eligibility. The review did not include gray literature, conference proceedings, or dissertations, which is noted as a limitation.

While the dual-database approach enhanced robustness, it may still underrepresent non-English, region-specific, or industry-focused publications not indexed in Scopus or WoS, potentially introducing language and geographic bias. This limitation is acknowledged in the interpretation of findings and highlights the need for broader multilingual and cross-platform search strategies in future reviews.

2.4.1 Identification

In the identification step, relevant keywords were derived from previous related articles and employed to search for literature in the Scopus and Web of Science (WoS) databases (Djeunang Mezafack et al., 2022). The keywords were selected with great care, ensuring they were highly relevant to the research topic. These included variations and synonyms of key terms related to the spatial patterns of retail outlets, such as "retail distribution," "urban retail patterns," "spatial evolution of retail," and "geographic retail concentration" (Andi et al., 2021). The comprehensive selection of these keywords helped to capture the broad scope of studies on the spatial distribution and evolution of retail outlets. The search strings used in these databases are presented in Table 1. As a result of this initial search, a total of 7,066 articles were retrieved, with 6,615 articles sourced from WoS and 451 from Scopus. This large dataset provided a broad foundation for further screening and analysis.

2.4.1.1 Search strategy

Working with an academic librarian at our institution UKM, a systematic search of published peer-reviewed research literature was conducted in PubMed, Scopus, and CINAHL. The same forward search was used for each database.

(* = truncation Boolean operator):

Retail store distribution: retail store* OR commercial outlet* OR shopping center* OR commercial area* OR commercial street* OR supermarket* OR convenience store* OR grocery store* OR retail format* OR retail layout*.

Spatial patterns and driving factors: spatial pattern* OR spatial distribution* OR spatial structure* OR agglomeration effect* OR diffusion effect* OR regional development* OR urban development* OR economic growth* OR driving factor* OR influencing factor* OR development model* OR spatial analysis*.

Main impact: urban development* OR economic growth* OR urban planning* OR urban spatial structure* OR commercial vitality* OR retail growth* OR consumer behavior* OR spatial agglomeration* OR economic benefit* OR commercial density*.

TABLE 1 Search strings used in WoS and Scopus databases.

Database	Search string	Result count
WoS	("retail outlet spatial pattern" OR "urban retail distribution" OR "commercial outlets evolution")	6,615
Scopus	("spatial distribution of retail" OR "retail industry patterns" OR "retail outlet evolution")	451

Reference lists (Table 2) from four of the existing systematic reviews were then hand-searched to identify any articles that may have been missed (backwards search).

2.4.2 Screening

Out of the 7,066 articles identified in the initial search, a second screening was conducted to further refine the selection process (Okoli, 2015). The first exclusion criterion was language, whereby 383 non-English articles were removed. This decision was made to ensure consistency in data interpretation as the review team's language proficiency was limited to English. While this approach facilitates methodological consistency, it may introduce language bias by underrepresenting region-specific studies published in languages such as Chinese, Spanish, or German. This limitation is acknowledged and suggests that future reviews with multilingual capabilities may uncover additional perspectives, especially from emerging economies or local contexts not captured in English-language databases (Egger et al., 1997; Morrison et al., 2012).

The second exclusion criterion involved publication year, with a focus on studies published between 2013 and 2023. This time frame was selected because the retail industry has experienced profound transformations over the past decade, especially due to the rise of e-commerce, digitalization, and evolving consumer preferences (Miao et al., 2021; Andi et al., 2021). As a result, 2,365 articles published before 2013 were excluded. In addition, 3 duplicate records were removed, and 4,090 articles were excluded after screening titles and abstracts, as they were found to be unrelated to the research topic based on their content focus, geographical scope, or methodological relevance. After applying all these screening criteria, a total of 275 articles advanced to the eligibility assessment stage.

2.4.3 Eligibility

Following the second screening, the 275 articles were further assessed for eligibility (Okoli, 2015). At this stage, the titles and abstracts of the articles were carefully reviewed to determine their relevance to the systematic literature review. This step was crucial to ensure that the selected articles directly addressed the spatial distribution and evolution of retail outlets in urban areas (Djeunang Mezafack et al., 2022; Gomes and Paula, 2017). As a result of this assessment, 147 articles were excluded for being irrelevant to the research topic. This left 128 articles that were deemed potentially eligible and required a full-text review to determine their final inclusion in the review.

2.5 Quality appraisal

To ensure methodological rigor and the relevance of included studies, a structured quality appraisal was conducted using the Mixed Methods Appraisal Tool (MMAT, Version 2018) (Hong et al., 2018). This validated instrument supports the evaluation of qualitative, quantitative, and mixed-methods studies based on five core criteria: (1) clarity and relevance of research questions, (2) appropriateness of study design, (3) adequacy of data collection procedures, (4) robustness of data analysis, and (5) coherence between data, interpretation, and conclusions.

Two independent reviewers with expertise in urban geography and retail spatial analysis assessed each study using the MMAT

TABLE 2 Summary of recent systematic reviews on the evolution of retail distribution, spatial patterns, drivers, and urban impacts.

1st author	Year	N	Spatial distribution patterns and driving factors	Main impact	Dates include	Citation
Reviews specifically focused on retail food environment interventions (direct evidence)						
Agatz et al.	2008	N/R	N/R (No detailed discussion of specific geospatial distribution patterns). Factors such as e-commerce growth, consumer expectations, technological	Efficient e-fulfillment and multi-channel distribution help to improve urban retail performance and consumer satisfaction, indirectly contributing to urban economic development	2000–2008	Agatz et al. (2008)
Bonfrer et al.	2022	178	N/R (No detailed discussion of specific geospatial distribution patterns). Factors such as the design of the retail environment, the degree of competition in the market and consumer preferences	The layout and competitive dynamics of the retail sector have a direct impact on consumer flows and spending, and thus on the urban economy	N/R	Bonfrer et al. (2022)
Gomes and Paula	2017	N/R	Positive impact of large anchor tenants on the sales of small non-anchor tenants and clustering effect. Consumer shopping patterns and retailer behavior in agglomeration retail centers	Positive impact of large anchor tenants on sales of smaller non-anchor tenants	N/R	Gomes and Paula (2017)
Feichtinger and Gronalt	2021	15	N/R (No detailed discussion of specific geospatial distribution patterns). Logistics factors, population density and retail mix	Shopping behavior can change dramatically with changes in external conditions	N/R	Feichtinger and Gronalt (2021)

N, number of included papers.
N/R, not reported.
*This review used gray literature as well as peer-reviewed academic literature and reported n as number of trials.

framework. Discrepancies in scoring were resolved through discussion, and a third senior researcher was consulted in cases of disagreement. This process ensured transparency, minimized individual bias, and enhanced the reliability of the review.

The MMAT's structured approach allowed for a comprehensive appraisal across varied methodological designs, ensuring that only studies meeting an acceptable threshold of quality were included in the final analysis. This step was essential for maintaining the academic rigor and credibility of the review's findings (Mohamed Shaffril et al., 2021).

2.6 Data abstraction and analysis

In the data abstraction and analysis phase, the results obtained from the selected studies were systematically analyzed to address the research questions. This process involved integrating and synthesizing both qualitative and quantitative findings to identify patterns, trends, and insights related to the evolution of spatial patterns in retail outlets.

Three key analytical themes were identified during the synthesis process: (1) International Evolution Trends, (2) Inter-city Changes, and (3) Intra-city Evolution. Each of these themes sheds light on different dimensions of retail spatial transformation:

International evolution trends: This theme explores the global changes in the retail industry, focusing on how various countries have adapted their commercial outlets in response to urbanization and technological advancements. Studies highlighted the increasing integration of e-commerce with physical retail spaces, the impact of digital technologies on shopping behaviors, and the globalization of retail chains. Notably, countries with advanced technological infrastructure exhibited more seamless transitions toward omnichannel retail models, while others faced significant challenges in integrating online and offline retail experiences (Levy and Grewal, 2023; Feichtinger and Gronalt, 2021).

Inter-city changes: Variations in retail spatial patterns across cities within a country were explored in this theme. Research pointed to significant disparities between larger, more developed cities and smaller, less urbanized ones. In major urban centers, retail outlets often concentrated in central business districts and high-traffic areas, whereas smaller cities saw more dispersed retail structures with a focus on localized markets. In addition, the rapid urbanization of smaller cities has led to a shift in retail strategies, with an increasing emphasis on convenience and accessibility in response to growing consumer demand (Miao et al., 2021; Liu and Ma, 2020).

Intra-city evolution: This theme delves into the dynamic transformation of retail patterns within individual cities. Retail outlets within cities have evolved due to local economic conditions, social trends, and policy interventions. For example, urban gentrification and changes in land-use policies often influence where new retail outlets are established. Studies also highlighted how the growth of specific commercial districts within cities reflects changing consumer preferences, such as a greater focus on experiential retail and lifestyle shopping centers. In addition, the rise of suburban shopping malls and the decline of traditional high streets in certain cities are key examples of intra-city retail evolution (Guy, 2002; Zhang et al., 2021).

Through these themes, the analysis provided a comprehensive understanding of the evolving spatial patterns of retail outlets at both the international, inter-city, and intra-city levels.

3 Results

3.1 Context of the selected studies

As shown in Figure 2, the selected studies varied in terms of geographic scope and scale of analysis. Among the 15 studies included in the review, only 1 study adopted a global perspective on the spatial

patterns of retail outlets (Kulke and Suwala, 2016). This study offered a comprehensive view of how global trends in urbanization, technology, and e-commerce have shaped the retail landscape across different regions.

Seven studies focused on urban-scale retail patterns, providing insights into specific cities or urban regions (Saraiva and Pinho, 2017; Hao et al., 2021; Erkip and Ozuduru, 2015; Zhang et al., 2023; Zhang, 2023; Kickert et al., 2020; Li et al., 2022). These studies explored the dynamics of retail distribution within individual urban contexts, emphasizing the unique factors influencing retail spatial arrangements in cities. The findings from these urban-scale studies often highlighted the role of local policies, economic conditions, and social behaviors in shaping retail outlets and underscored the significant spatial variations between larger metropolitan areas and smaller cities or regions.

In contrast, eight studies addressed national-scale analyses, offering a broader perspective on retail distribution patterns across entire countries (Astbury and Thurstain-Goodwin, 2014; Kirby-Hawkins et al., 2019; Zhang and Wei, 2015; Burger et al., 2014; Hughes and Jackson, 2015; McGreal and Kupke, 2014; Nertinger et al., 2022; Martin, 1961; Alexander, 2008). These studies examined how retail outlets are distributed and evolve across entire national territories, revealing macro-level trends that often extend beyond the local nuances captured in urban studies. National-scale research provided valuable insights into broader patterns, such as the relationship between economic development, infrastructure expansion, and retail proliferation in different regions of a country.

This distribution of studies illustrates the diverse range of scales that researchers have applied to understand the spatial patterns and evolution of retail outlets. While urban studies dominate the research landscape, national-scale analyses offer a crucial perspective on the broader trends and forces that shape retail distribution patterns across regions. The combination of both levels of analysis enables a deeper understanding of how retail spaces evolve in response to complex socio-economic, technological, and policy-driven factors, providing a comprehensive view of the retail landscape.

To better understand the geographic scope of the reviewed studies, we classified them into three categories based on their spatial scale of analysis:

(a) Global scale: studies that examine cross-continental or multi-country retail spatial trends.
(b) Country scale: studies that focus on national retail patterns within a single country.
(c) City scale: studies that investigate retail outlet distribution within a specific urban region or metropolitan area. Figure 3 illustrates the geographic focus and scale of each selected study, highlighting the trends in spatial research of retail outlets at different scales.

3.2 Geographical distribution of studies

Excluding the one global-scale study (Kulke and Suwala, 2016), the selected articles were from diverse locations across different continents, as depicted in Figure 3. A total of 11 studies originated from Europe, including 4 from the United Kingdom (Astbury and Thurstain-Goodwin, 2014; Kirby-Hawkins et al., 2019; Hughes and Jackson, 2015; Alexander, 2008), one from Portugal (Saraiva and Pinho, 2017), the Netherlands (Burger et al., 2014), Switzerland (Nertinger et al., 2022), Turkey (Erkip and Ozuduru, 2015), France (Zhang et al., 2023), Mexico (Ortega-Avila, 2023), and whole Europe (Kunc and Križan, 2018). These studies contribute a European perspective to the literature, reflecting the region's advanced urban infrastructure and complex retail dynamics influenced by local socio-economic and cultural factors.

In addition, four articles focused on Asia, with all of them based in China (Hao et al., 2021; Li et al., 2022; Zhang, 2023; Zhang and Wei, 2015; Martin, 1961; Liao et al., 2023; Yang et al., 2024). China's rapid urbanization and diverse regional economic conditions make it an essential case for understanding retail spatial patterns in a developing economy. The research conducted in China provides valuable insights into how cities of varying sizes and economic statuses are adapting their retail landscapes in response to technological advancements and shifting consumer behaviors.

One study was conducted in the Americas, specifically the United States (Kickert et al., 2020), offering a North American perspective on retail spatial patterns. This study highlights the relationship between retail evolution and socio-economic factors in large, developed urban areas, such as those in the U. S. Finally, one study was from Australia (McGreal and Kupke, 2014), offering insights into retail spatial patterns within a developed economy characterized by vast geographic size, low population density, and highly concentrated urban centers. This study highlights how Australia's unique spatial distribution of population and infrastructure influences retail development and locational strategies.

Figure 4 illustrates the geographical distribution of the 15 reviewed studies. The work by Kulke and Suwala (2016), which adopts a global perspective without specific national focus, is represented as a symbolic point located in the Atlantic Ocean. Countries are color-coded according to the number of studies conducted within each, ranging from light to dark shades indicating one to four publications, respectively.

This geographical distribution of the studies highlights the international nature of the research on retail spatial patterns, with significant contributions from both European and Asian regions. It also underscores the growing interest in analyzing retail geography in both developed and developing economies across different continents.

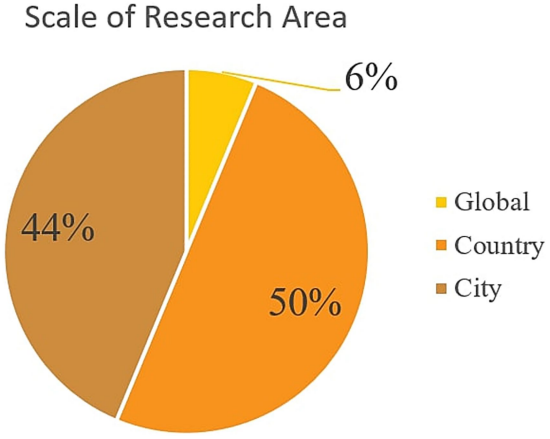

FIGURE 3
Scale of research area.

These findings indicate that the spatial organization of retail outlets is a global issue, with regional variations reflecting diverse economic contexts, urbanization rates, and technological innovations. The spread of studies across continents also points to the increasing importance of understanding retail dynamics in a globalized, interconnected world.

3.3 The main factors influencing the evolution of retail distribution patterns

The spatial evolution of retail outlets is shaped by a variety of interrelated factors that influence retailers' locational choices and operational strategies. Based on the thematic analysis of the 15 selected studies, several recurring drivers were identified, including urban planning policies, consumer behavior shifts, technological innovation, transportation accessibility, and socio-economic conditions. These factors were consistently discussed across the literature and represent the core dimensions shaping retail distribution patterns in both urban and rural contexts.

The following sections synthesize these key factors as identified and interpreted from the analyzed studies, providing a structured overview of how different forces influence the spatial organization of retail outlets.

3.3.1 Government policy

Government regulations and policies are pivotal in shaping the spatial distribution of retail outlets. Zoning laws, land-use policies, and urban planning regulations can either promote or hinder the establishment and growth of retail locations. In many cases, government incentives such as tax breaks or subsidies are designed to encourage retailers to set up in specific areas, often focusing on fostering economic development in underserved or underdeveloped regions. Urban redevelopment projects, such as converting brownfield sites into commercial zones, also directly affect the availability of retail space and influence spatial patterns (Zhang and Wei, 2015).

At the international, national, and local levels, government policies are among the most influential factors in retail distribution (Levy and Grewal, 2023). Urban planning, zoning regulations, and land-use policies serve as the framework for retail development, guiding where retail outlets are located and how they evolve over time. For instance, Hao et al. (2021) highlight the role of urban planning in determining retail locations. In Changchun, China, for example, government policies shaped the creation of commercial districts by restructuring administrative boundaries. However, as local rent prices rose due to policy shifts, retail outlets began to relocate (Chakraborty et al., 2014).

Studies by Zhang et al. (2023), Hughes and Jackson (2015), and McGreal and Kupke (2014) further emphasize the impact of

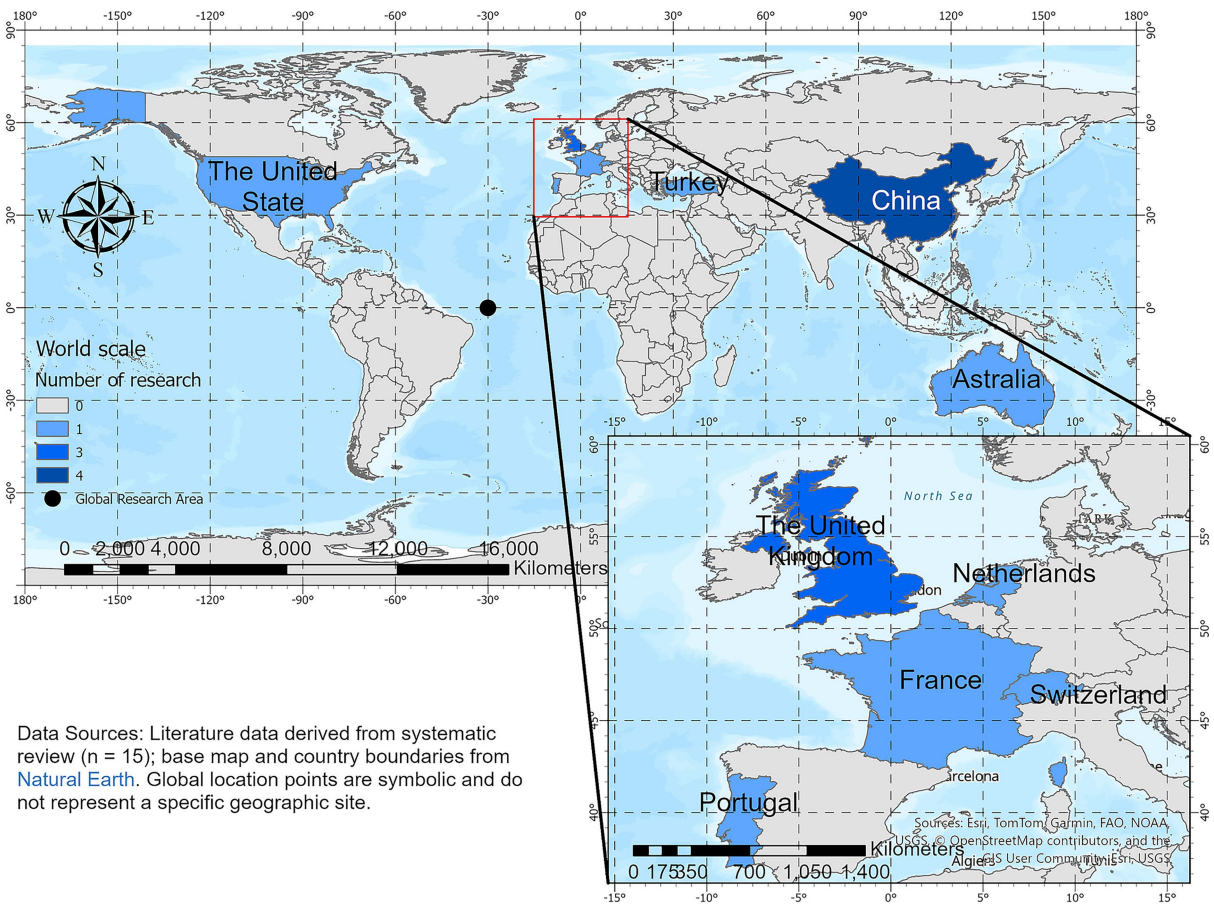

FIGURE 4
Research literature distribution map.

government policies, such as tax incentives, infrastructure development, and land availability, on retail distribution. Tax incentives can attract businesses to less developed areas, while infrastructure improvements, such as public transportation and road networks, can make certain locations more appealing for retail expansion (Blauwens et al., 2006). The availability of land also plays a key role in the growth of retail outlets as commercial spaces may become more limited in densely populated urban centers.

Government policies also influence consumer behavior by improving accessibility to retail areas, which can further shape spatial patterns. Investments in transportation infrastructure or road networks, for example, can make previously less accessible areas more desirable for retail businesses (Blauwens et al., 2006). Conversely, restrictive policies such as limits on retail hours or the size of commercial establishments may inhibit retail growth or lead to the displacement of businesses (McGreal and Kupke, 2014). Ultimately, government policies are crucial in shaping the evolution of retail outlet distribution, determining which areas become commercial hubs and how retail landscapes change over time.

3.3.2 Consumer characteristics

The characteristics of the target consumer base—such as consumption levels, preferences, and social class, play a crucial role in shaping retail distribution (Hao et al., 2021). As consumers' standards of living improve, their expectations evolve, shifting from a primary focus on price to valuing quality and the overall shopping experience (Chakraborty et al., 2014). This change in consumption habits influences retailers' location decisions as they increasingly seek integrated and specialized commercial complexes that cater to the diverse demands of more affluent consumers.

Studies by Saraiva and Pinho (2017) and Erkip and Ozuduru (2015) emphasize the impact of consumer characteristics on retail location choices. These studies note that factors such as income levels and lifestyle preferences can dictate the type of retail space required. Retailers must not only consider consumers' purchasing power but also their preferences for convenience, accessibility, and the kind of shopping experience they seek. In this regard, demographic and socio-economic factors—such as income levels, age, lifestyle, and cultural preferences—play a pivotal role in shaping the spatial distribution of retail outlets.

For example, in cities with diverse populations, niche markets often emerge, leading to the clustering of specialized retail outlets that cater to specific cultural or consumer segments (Hao et al., 2021; Zhang et al., 2023). These specialized outlets might target unique consumer needs, such as cultural products, dietary preferences, or luxury goods, and are typically located in areas where those segments are most concentrated. Understanding these consumer characteristics is essential for retailers when choosing the best locations for their stores, as it allows them to tailor their offerings to the distinct needs and desires of local populations. Therefore, consumer characteristics are key in determining the spatial patterns of retail outlets, influencing not only the types of goods offered but also the form and function of retail spaces within urban environments.

3.3.3 Transportation networks

Transportation accessibility is a critical factor influencing the spatial distribution of retail outlets (Blauwens et al., 2006). The ease with which consumers can access retail locations is largely determined by the transportation infrastructure available, including roads, public transport systems, and proximity to major transportation hubs such as airports and train stations (Saraiva and Pinho, 2017). Retail outlets situated in areas with strong transportation links tend to attract higher foot traffic, leading to increased profitability.

Hao et al. (2021) and Erkip and Ozuduru (2015) highlight the importance of transportation networks in the evolution of retail outlets. They stress that retailers are more likely to select locations with easy access to major transportation routes. Li et al. (2021) further underscore the significance of proximity to airports, noting that airports serve as major entry points for both international and domestic consumers, which can influence retail patterns.

The accessibility and connectivity of retail locations are heavily shaped by the surrounding transportation infrastructure. Areas with well-developed networks, such as highways, public transit systems, and pedestrian pathways, are more attractive for retail establishments due to the convenience they offer to consumers. Moreover, retail outlets near transportation hubs, such as bus stations, train stations, or airports, tend to see higher customer volumes because of the easy access provided by these transit points. Retail locations close to transit stations, for example, typically experience higher foot traffic due to the convenience of public transportation (McGreal and Kupke, 2014). As urban areas continue to grow and evolve, transportation networks remain one of the most crucial factors in determining the distribution of retail outlets.

3.3.4 Retail formats

The nature of retail formats plays a crucial role in determining the spatial distribution of retail outlets. Different retail types require different spatial conditions to thrive. For example, large-scale retail complexes such as shopping malls or mixed-use developments typically need locations that are easily accessible by both car and public transportation. These outlets benefit from being situated in areas with ample parking and convenient access to major roads, ensuring accessibility for a wide range of consumers (Hao et al., 2021).

In contrast, lifestyle retail businesses, which often rely on foot traffic, tend to favor locations with high pedestrian density, such as city centers or busy shopping streets (Kickert et al., 2020; Burger et al., 2014). The type of retail format influences site selection as retailers aim to align their outlets with consumer traffic patterns and the specific preferences of their target market.

The evolution of retail formats, such as shopping malls, supermarkets, online stores, and specialty shops, has a direct impact on retail distribution patterns (Feichtinger and Gronalt, 2021). The rise of large-scale shopping malls and commercial centers, particularly in densely populated urban areas, has led to the concentration of retail outlets in these hubs, where consumers can access a wide variety of goods and services in one location. However, the increasing prevalence of e-commerce has also transformed the retail landscape, introducing new spatial dynamics. In many cases, this has resulted in a hybrid model where both physical stores and online platforms coexist, each influencing the other. As retailers adapt to changing consumer behaviors and the rise of online shopping, the spatial organization of retail outlets continues to evolve, merging traditional and digital shopping experiences (Levy and Grewal, 2023; Feichtinger and Gronalt, 2021).

In addition to digital platforms and evolving consumer behaviors, emerging architectural technologies—such as 3D-printed modular

retail structures and fractal-inspired sustainable building skins—are reshaping the spatial logic of retail distribution. These innovations enable retailers to deploy adaptive, decentralized outlets that respond flexibly to site constraints and shifting urban demand. For example, Liu H. et al. (2025) and Liu Y. P. et al. (2025) demonstrate how modular 3D-printed hubs support localized production and consumption models, reducing reliance on centralized logistics and thereby influencing retail site selection. Similarly, fractal-designed building envelopes offer energy-efficient, foldable skins that optimize both environmental performance and consumer flow patterns (Liu H. et al., 2025; Liu Y. P. et al., 2025; He and Liu, 2023). By facilitating more sustainable and spatially responsive retail environments, such technofixes expand the possibilities for how and where retail formats can operate in rapidly changing urban systems.

Recent innovations in digital fabrication, particularly 3D-printed modular construction and fractal-inspired architectural design, are reshaping the spatial logic of retail environments. These technologies enable scalable, prefabricated retail shells that can be rapidly deployed in both dense city centers and underserved peripheral zones. Beyond operational flexibility, fractal-designed building skins improve passive ventilation, energy efficiency, and spatial adaptability—qualities critical in evolving urban contexts. By supporting modularity, mobility, and environmental integration, these architectural approaches align with emerging paradigms of sustainable and distributed retail infrastructure (Liu H. et al., 2025; Liu Y. P. et al., 2025; He and Liu, 2023).

3.3.5 Social culture

Socio-cultural factors, including religious beliefs, cultural practices, and social norms, significantly influence the distribution of retail outlets, especially in regions with strong cultural or religious traditions (Kulke and Suwala, 2016). In some countries, particularly those with a strong religious influence, consumer preferences for separate, enclosed shopping spaces can drive the development of specific retail formats, such as religiously neutral malls or gender-segregated spaces. Erkip and Ozuduru (2015) and Zhang and Wei (2015) emphasize how socio-cultural influences shape retail location decisions. In areas with distinct cultural or religious preferences, retailers must adapt by offering specialized products or creating retail environments that align with consumers' cultural values and expectations.

Social and cultural factors also play a pivotal role in shaping retail distribution. Cultural trends, social behaviors, and lifestyle choices influence consumer purchasing patterns, which in turn affect retailers' location decisions. For instance, in areas with a high concentration of young professionals, retailers may focus on establishing outlets that cater to trendy, fast-fashion, or technology-driven products. In addition, cultural preferences can impact the product offerings of retail outlets, with stores in multicultural cities often diversifying their product ranges to cater to the varied tastes of their customers.

Moreover, social factors such as the growing demand for "experiential" shopping—where consumers seek more than just products but a unique in-store experience—have contributed to the development of specialized retail areas designed to offer an immersive shopping environment. These experiences are becoming increasingly important, particularly in urban areas, where the desire for distinct and engaging retail environments continues to influence the location choices of retailers (Kickert et al., 2020).

Each of these factors such as government policies, consumer characteristics, transportation networks, retail formats, and social and cultural influences plays an integral role in shaping the distribution and evolution of retail outlets. By understanding the interplay of these elements, retailers and urban planners can better predict and influence the development of retail spaces, optimizing both the commercial potential and accessibility of retail outlets across urban and rural areas.

4 Discussion

This study provides a comprehensive analysis of the evolving spatial patterns of retail outlets, highlighting the dynamic and multifaceted factors that influence retail distribution across global, national, and urban scales. As retail outlets transform from simple, localized businesses into complex, integrated commercial hubs, they are profoundly shaped by technological advancements, government policies, transportation infrastructure, and changing consumer behaviors. The findings underscore that retail evolution is not a linear process but a complex interplay of economic, social, and technological forces that differ across regions and time periods (Levy and Grewal, 2023; Bonfrer et al., 2022; Zhang et al., 2023).

Furthermore, to better understand the complexity and hierarchical nature of retail spatial distribution, future research could adopt fractal dimension analysis, particularly the two-scale fractal dimension (He and Liu, 2023). This mathematical approach, widely used in urban geography and complex systems research, quantifies the self-similarity and spatial intricacy of distribution networks. Applying this method to retail clusters could reveal how spatial complexity evolves with urban expansion, decentralization trends, or policy interventions. Such an approach offers a powerful lens to analyze non-linear retail development patterns and complements the qualitative findings synthesized in this review.

Government policies emerge as a critical determinant in shaping the geographic spread of retail outlets, often serving as a guiding framework for urban and economic development (Zhang and Wei, 2015; Hao et al., 2021). The growing influence of consumer preferences—toward convenience, quality, and the overall shopping experience—has led to the rise of specialized retail formats and a shift toward larger, more integrated commercial spaces (Türk et al., 2014; Mihaela, 2015). In tandem with this, advancements in transportation and the rise of e-commerce have significantly altered the accessibility and sustainability of physical retail spaces (Hagberg and Fuentes, 2018; Bonfrer et al., 2022).

The continued decentralization of retail from city centers to suburban areas reflects broader societal trends of urbanization and counter-urbanization (Champion, 2001; Kickert et al., 2020). As cities evolve and consumer demands shift, retailers must adapt to new spatial dynamics, leveraging both physical and digital platforms to meet the diverse needs of their target markets.

To further illustrate the intra-urban disparity in retail development, Figure 5 presents a comparison between Dadongmen Street and Dahongmen Street in Fengtai District, Beijing. Data sources: Retail POI from Amap API; administrative boundaries from Beijing Municipal Open Data; base layers from Esri and OpenStreetMap. While Dadongmen exhibits a high-density clustering of retail outlets concentrated around key commercial corridors, Dahongmen shows a scattered and low-density pattern, lacking

defined retail cores. This spatial contrast reinforces our broader findings regarding the uneven distribution of retail infrastructure within urban territories, driven by factors such as accessibility, zoning, and local demand profiles.

Furthermore, socio-cultural factors, particularly in culturally and religiously diverse regions, play a crucial role in shaping the design and location of retail outlets, ensuring they cater to the distinct values and preferences of local communities (Kulke and Suwala, 2016; Erkip and Ozuduru, 2015). Moreover, integrating two-scale economic modeling frameworks—such as a revised Evans model—offers an advanced approach to simulate how retail networks respond to macroeconomic fluctuations and policy interventions (Evans, 1985). These models can formalize the relationships between spatial heterogeneity (e.g., clustering intensity and entropy) and economic outcomes (e.g., consumption patterns and GDP growth). As emphasized by Batty (2007), the integration of spatial metrics into dynamic economic modeling can serve as a powerful tool to evaluate systemic resilience and complexity. Future empirical research could apply such models to multi-scalar datasets to bridge spatial theory and urban economic forecasting.

In addition, the application of two-scale population-economic dynamic models presents a promising avenue for forecasting retail demand (Anas et al., 1998). These models integrate micro-scale demographic changes—such as population flows, income mobility, and land-use transitions—with macroeconomic shifts including urban expansion strategies and national development policies. This multi-scalar framework captures the feedback loop between local retail transformations and structural economic evolution. Incorporating such models could enhance spatial planning accuracy and support adaptive retail infrastructure strategies under demographic and policy uncertainty.

This study emphasizes that the global retail landscape is at a critical juncture, driven by continuous changes in technological, social, and economic contexts. Future research should delve deeper into how these various factors interact and evolve, offering further insights into the future trajectory of retail distribution and the implications for both businesses and urban development. Understanding these forces will allow policymakers and retailers to better anticipate shifts in consumer behavior and adapt strategically to the changing retail environment (Zhang et al., 2023; Levy and Grewal, 2023).

To further explore the implications of spatial complexity in retail systems, future research could adopt quantitative modeling approaches that more explicitly formalize the link between spatial patterns and economic performance. A promising direction involves adapting simplified dynamic economic models—such as a modified Evans model (Evans, 1985)—to examine how variables such as fractal dimension or network entropy correlate with urban economic indicators, including GDP growth or retail productivity. This modeling framework could help quantify the hypothesis that greater spatial diversity and interconnectivity within retail networks foster enhanced economic resilience. Such an approach is consistent with recent work

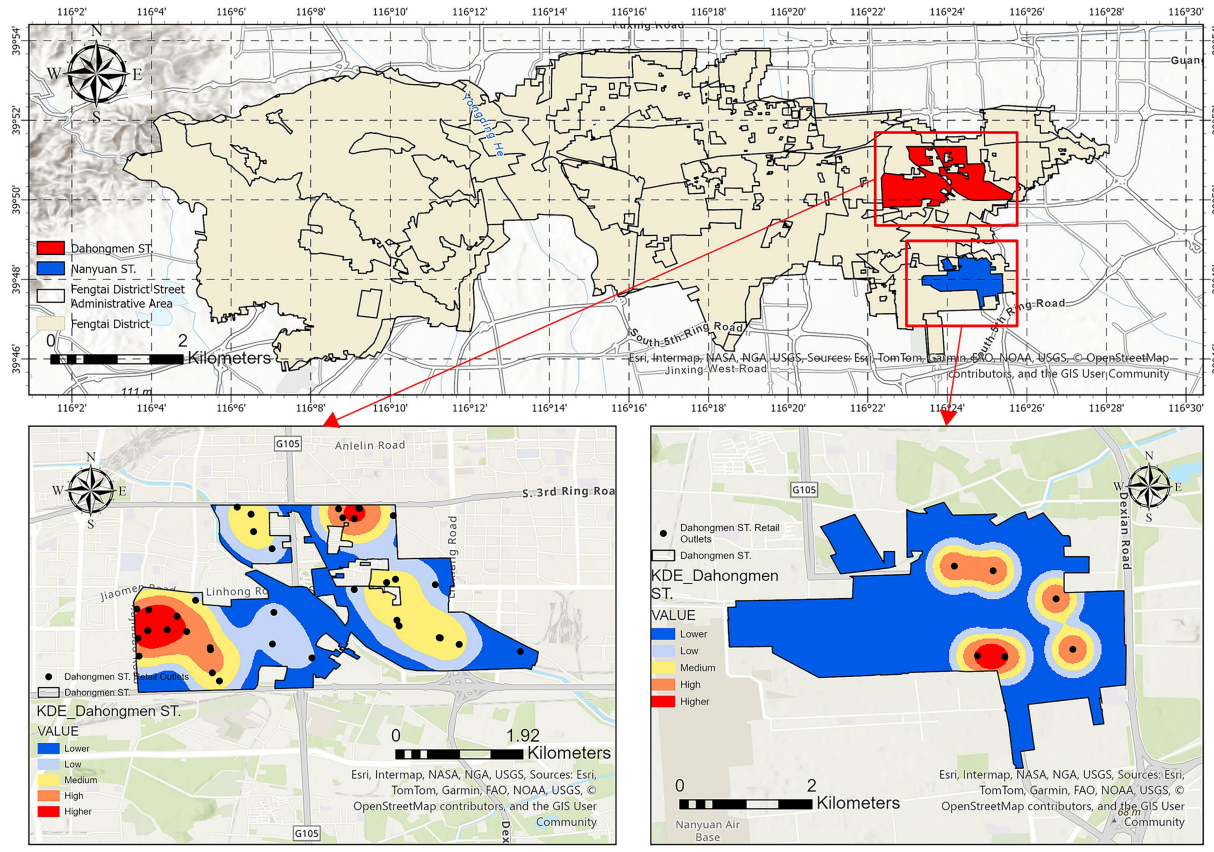

FIGURE 5
Visual comparison of retail density between two neighborhoods in Fengtai District, Beijing.

in urban complexity, which emphasizes the integration of spatial structure into economic modeling to better capture systemic urban behavior (Batty, 2005). By incorporating spatial metrics into economic analysis, researchers and policymakers would gain deeper insights into how retail spatial strategies contribute to balanced and sustainable urban development.

In light of the systematic review approach adopted in this study, it is important to reflect on the methodological scope and global relevance of the findings. While the review synthesized a relatively small number of studies, the insights derived reveal consistent patterns in the spatial evolution of retail systems across diverse contexts. This aligns with other systematic reviews in urban and retail research, which also emphasize the critical role of spatial configuration, governance regimes, and socio-economic transitions in shaping distributional outcomes (Németh et al., 2021; Zakharovskyi and Németh, 2021).

We acknowledge that variations in data availability, national research focus, and the exclusion of non-English sources may limit the representativeness of the evidence base. Nevertheless, the synthesis offers a valuable global overview of how retail landscapes are being transformed by urbanization and technological innovation. Future research could build on this work by incorporating multilingual corpora, region-specific frameworks, or automated mapping tools to enhance the breadth and granularity of analysis.

Despite the valuable insights generated through this review, several limitations merit discussion. First, the geographic concentration of studies in North America, Europe, and East Asia highlights a notable imbalance in the global literature on retail spatial patterns. Regions such as Africa, Latin America, and parts of Southeast Asia are conspicuously absent from the reviewed studies. This gap may stem from language-based publication bias, underrepresentation in mainstream academic databases such as Scopus and WoS, or limited research capacity and data availability in these regions. As a result, the findings of this review—though comprehensive within their context—may not fully reflect the diversity of retail spatial evolution worldwide.

Second, the methodological framework adopted—while grounded in a rigorous systematic review—relies on a relatively small and thematically clustered sample of 15 high-quality studies. This constrained sample size, due to strict inclusion criteria, affects the generalizability of the findings. While the identified patterns are robust within urbanized, high-income contexts, their applicability to less formalized or rapidly urbanizing regions remains uncertain.

Furthermore, scale remains a critical issue in retail spatial analysis. Most studies reviewed here focus either on national or urban contexts, with little engagement with intermediate scales (e.g., regional corridors and cross-border retail zones) or multi-scalar interactions (e.g., how global trends cascade into local retail morphologies). Future research should explicitly address these scale dynamics by employing multi-level modeling, comparative regional studies, or cross-scalar GIS analyses to deepen our understanding of retail system evolution in a globalized world.

To advance this field, future systematic reviews should incorporate multilingual databases, include gray literature, and actively seek contributions from underrepresented regions. Doing so would not only improve the global representativeness of research but also uncover alternative retail models and innovations emerging from the Global South.

Ultimately, enhancing methodological pluralism, data inclusivity, and regional equity in retail geography research will not only strengthen empirical generalizability but also support evidence-based policy formulation for inclusive and sustainable urban commercial planning worldwide.

5 Conclusion

This study reviewed 15 articles that explored trends in the distribution of retail business outlets and the factors influencing these trends, systematically analyzing the evolution of retail patterns at international, national, and urban levels over the past decade. The geographic diversity of the studies, covering regions in Europe, the Americas, Australia, and Asia, strengthens the credibility and generalizability of the findings, offering a comprehensive perspective on global retail distribution.

The key issues addressed in this study revolve around the primary trends and influential factors shaping retail distribution patterns. The research categorized retail distribution trends into three primary dimensions: (1) international trends, (2) inter-city variations within countries, and (3) intra-city dynamics. The influencing factors were further grouped into five major categories: (a) government policies, (b) consumer characteristics, (c) transportation infrastructure, (d) retail formats, and (e) socio-cultural influences. These factors interact in complex ways, contributing to the multifaceted nature of retail distribution across various scales.

The study's findings underscore the significant role played by government policies, consumer demand, transportation infrastructure, retail formats, and socio-cultural factors in shaping retail distribution. These influences vary by region and scale, resulting in diverse retail patterns globally. For instance, while some regions experience retail decentralization and suburbanization, others may face urban consolidation, highlighting the impact of local contexts on retail evolution. This diversity is crucial for understanding the complexities of retail patterns and their alignment with broader societal and economic trends.

The conclusions drawn from this study offer valuable insights for both retailers and policymakers. For governments, the ability to analyze and understand retail industry developments provides a theoretical foundation for informed urban and commercial planning. Policymakers can use these insights to optimize spatial planning, design policies that foster retail growth, and ensure alignment with retail trends. For retail executives, understanding the evolution of retail layouts and the factors influencing their development can inform strategic decisions, helping to choose optimal locations that align with urban development plans and contribute to long-term business success.

Future research could build on this study by expanding the geographical scope and incorporating diverse cultural, economic, and environmental factors across different regions. This would provide a deeper understanding of how various socio-economic dynamics interact to shape retail distribution patterns. A more extensive exploration of these dimensions across various cultural and economic

contexts will enhance our global understanding of the retail landscape and further refine strategies for adapting to the ever-evolving retail environment.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Author contributions

XL: Conceptualization, Data curation, Formal analysis, Software, Visualization, Writing – original draft. RC: Conceptualization, Data curation, Funding acquisition, Investigation, Project administration, Supervision, Validation, Writing – review & editing. AA: Supervision, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

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