“Foreign direct investment and its influence on China’s economic growth: A comprehensive review”

AUTHORS	Md Kamal Hossain Eszter Lukacs Laszlo Vasa

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Md Kamal Hossain (Hungary), **Eszter Lukács** (Hungary), **László Vasa** (Hungary)

FOREIGN DIRECT INVESTMENT AND ITS INFLUENCE ON CHINA'S ECONOMIC GROWTH: A COMPREHENSIVE REVIEW

Abstract

This study aims to systematically analyze and synthesize the existing scientific literature on the determinants of long-term capital flows, particularly Foreign Direct Investment (FDI) into China, with a focus on how prior empirical studies examine the roles of trade openness, infrastructure development, institutional quality, and financial modernization. Using the PRISMA framework, the study systematically reviewed 114 peer-reviewed articles published between 1990 and 2025 to identify recent patterns, evaluate the impact of core sources, and highlight thematic trends in academic literature. The finding of this study indicates a clear upward trend in article production, with a significant jump from 124 publications in the UK to 1,855 in China, with China emerging as the leading contributor and host to several highly influential articles. The Journal of International Trade/Economics is the leading source with 109 documents, followed by China Economic Review (63), Research in Emerging Markets Finance and Trade (45), and Economic Modeling (36). A total of 780 authors contributed to these works, with 2.96 co-authors per document on average, but international co-authorship was limited. This study also highlighted FDI as a key theme with 254 counts following Economic Growth/Development (181 mentions) and Trade (146), which indicates a strong research interest in the role of capital flows and macroeconomic performance in the Chinese context. This study analyzed 639 articles for the bibliometric review, with a primary focus on FDI. However, other significant components of long-term capital flows, such as portfolio investment, external debt, and remittances, were not adequately covered, representing a key limitation of this study. Additionally, the direction of causality between FDI and China's economic growth was not covered by this study.

Keywords long-term capital flow, China's economic growth, capital flow determinants, macroeconomic trends, foreign direct investment, portfolio investment

JEL Classification C58, F21, F43, G11

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Md Kamal Hossain, Ph.D., Doctoral School of Regional and Business Administration Sciences, Doctoral Program in Business Administration Sciences, Széchenyi István University, Hungary. (Corresponding author)

Eszter Lukács, Associate Professor, Doctoral School of Regional and Business Administration Sciences, Doctoral Program in Business Administration Sciences, Széchenyi István University, Hungary.

László Vasa, Professor, Doctoral School of Regional and Business Administration Sciences, Doctoral Program in Business Administration Sciences, Széchenyi István University, Hungary.

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INTRODUCTION

China's rise as a global economic powerhouse over the past four decades has been closely tied to substantial inflows of long-term capital. These flows encompassing FDI, portfolio investments in equities and bonds, and external debt have been pivotal in driving macroeconomic transformation, technological progress, and regional development. This study focuses on the nature of these capital flows and their short- and long-term impacts on economic growth through various economic channels, specifically within the Chinese context, to explore how long-term capital contributes to the nation's sustainable economic development. Understanding these dynamics addresses a key challenge for emerging markets: harnessing foreign capital not merely for short-term benefits, but for fostering sustainable, innovation-driven, and inclusive growth. As a key driver of globalization and economic integration, these capital flows significantly influence macroeconomic trends, technological innovation, and regional development. While many works explore macroeconomic impacts, there has been limited

research on the integrated dynamic roles of financial digitalization, institutional quality, and regional disparities in shaping the effectiveness of these flows. There is also a lack of in-depth analysis on how technological innovations like blockchain interact with capital inflows to influence productivity and financial inclusion. Furthermore, most empirical studies fail to utilize advanced econometric techniques or bibliometric methods that could provide a more robust, multidimensional knowledge of the determinants and consequences of long-term capital movements in China. To achieve the primary and secondary goals, the following key research questions were developed as RQ1. What are the key factors attracting long-term capital inflows to China, and how do these factors interact with China's macroeconomic trends and policies? RQ2. How do trade openness, infrastructure development, and institutional quality interact with long-term capital inflow and growth of the Chinese economy? RQ3. How do financial development and digitalization contribute to shaping the impact of long-term capital inflows on productivity, innovation, and regional disparities in China?

1. LITERATURE REVIEW

1.1. Bibliometric analyses

The literature on long-term international capital flows has grown rapidly, with many studies emphasizing systematic reviews, bibliometric mappings, and meta-analyses to synthesize findings across hundreds or thousands of papers. In line with the PRISMA framework, recent overviews have rigorously filtered the literature to identify core themes and trends (Farzam et al., 2025). These reviews reveal that China, the USA, and other major economies dominate publications on foreign investment, and highlight key determinants of capital inflows such as trade openness, infrastructure quality, institutional strength, and financial development. Similarly, Islam and Beloucif (2023) identified market size as the most consistent determinant, followed by trade openness, infrastructure quality, labor costs, macroeconomic stability, human capital, and future growth potential. These factors are recurring themes across reviews and meta-studies, emphasizing how domestic conditions interact with global push-pull forces of capital flows (Koepke, 2015).

This review organizes the literature into three categories: bibliometric analyses, which map publication trends and knowledge structures; meta-analyses, which synthesize quantitative results across empirical studies; and systematic literature reviews, which qualitatively summarize findings. Each section critically evaluates methods (e.g., PRISMA, Biblioshiny, VOSviewer, and meta-regression), highlighting strengths and limitations and drawing implications for China's long-run investment inflows and growth.

Bibliometric and scientometric studies use large databases to trace publication volume, co-authorship networks, and thematic clusters. These methods excel at revealing broad research trends but depend on database coverage and chosen keywords. For example, Raza et al. (2024) used WoS data to show that only about 15% of FDI research addresses climate change during 1961-2023, yet those papers have higher citation impact. This indicates an emerging shift toward "green" foreign investment themes. Similarly, Nobanee et al. (2024) applied bibliometric laws to 4,525 FDI articles (1942–2020) and identified six major research streams, such as labor, energy consumption, financial infrastructure improvement, innovation, corruption, and spillovers, reflecting broad topical emphases. Such taxonomies help pinpoint gaps and set agendas for China-relevant topics like sustainable investment. Nazzal et al. (2025) conducted a bibliometric analysis of 533 articles on FDI's role in multinational companies. They found that only a few authors and journals dominate the field, and they mapped four sub-themes – FDI determinants, entry modes, performance of MNCs, and globalization pathways. These themes overlap with China's experience: many studies focus on what drives foreign capital and how it translates into firm- or country-level outcomes. The finding that top journals are the International Business Review and the International Journal of Emerging Markets suggests where China-related research tends to appear. However, bibliometric maps cannot assess causality or consistency of results across studies; they only outline "who wrote what" and the co-occurrence of keywords. Critics note that

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relying solely on citation databases may miss relevant policy reports or regional journals, potentially biasing conclusions.

Farzam et al. (2025) combined bibliometric and systematic review methods on 167 articles (2003–2021) about foreign capital flows, institutional quality, and financial development. They reported an annual publication growth of about 5.6% and noted that China, Malaysia, and the USA are among the most prolific contributors in this literature. Their thematic mapping showed that "institutional quality," "financial development," and "FDI" were central themes. This underscores that scholars see institutional and financial capacities as core to understanding capital flows, precisely the moderating factors our research question highlights. Migliavacca et al. (2023) conducted a bibliometric analysis of 242 articles on portfolio diversification published between 1974 and 2022 in top-tier journals. Using VOSviewer and content analysis, they identified four key research streams, such as portfolio diversification (PD) theory, strategies, geographic focus on emerging markets, and asset class benefits, and outlined 57 future research questions, providing a structured agenda for ongoing inquiry. Sharma et al. (2023) identified clusters around leveraged buyouts, governance, and exit strategies in 302 PE articles, while highlighting gaps such as employment effects and sustainable private equity (PE). Silva-Oliveira et al. (2021) analyzed 806 FDI studies in emerging markets, revealing themes of inward flows, institutional environments, and location choice, with underexplored areas including subnational institutions and environmental sustainability. Both studies provide structured overviews and point to future research directions in capital movement literature.

Rodríguez-Chávez et al. (2024) conducted a bibliometric and systematic review of FDI's role in sustainable development, covering 667 articles (2019 – early 2024). Their bibliometric results showed Asia as the most-studied region for FDI–SDG topics. Qualitatively, they found that the economic and environmental perspectives dominate the literature, whereas the social impacts of FDI are under-researched. Key clusters included "sustainable innovation," "renewable transition," and "environmental degradation." For China specifically, these findings imply that while trade- and GDP-related growth effects of FDI are well covered, issues such as inequality or firm ownership structures need more attention. The combination of tools gives a rounded picture, though, like all such reviews, it may overlook the latest unpublished work or niche journals. Other bibliometric studies reinforce similar points. Wang et al. (2022) mapped 1,075 FDI–economic growth papers and identified three core clusters: technology & firm performance, theoretical inquiry, and econometric modeling. They noted a rising focus (post-2010) on sustainability issues (FDI–CO_2, environment), and stressed context-specific factors in the FDI-growth nexus. While not cited directly here, this work agrees with our meta-analytical findings on moderation. Likewise, Keh et al. (2024) reviewed 2,484 documents on financial development–growth and found that recent years have seen bursts around "green finance," "environment," and "renewable energy", indicating a shift toward sustainability. Their country network analysis highlights China as a major collaborator, reflecting its central role in global FDI research. Mahmoud et al. (2024) conducted a bibliometric review of 303 capital structure studies (2012–2022) using VOSviewer, highlighting corporate governance, leverage, and financial performance as key themes. The study noted a research peak in 2020 and emphasized growing interest during global crises such as COVID-19.

1.2. Meta-analyses

Meta-analyses aggregate numerical results from many studies to estimate average effects and test how they vary by context. They provide quantitative rigor but face challenges of publication bias and heterogeneity. For example, Cazachevici et al. (2020) meta-analyzed 538 estimates of remittances' impact on growth. They found a highly mixed picture: 40% of studies report a positive effect, 20% negative, and the remaining 40% showed no effect. After correcting for publication bias, they conclude that remittances have a small but positive effect on long-term growth overall, with significant regional differences. Crucially, findings show that many studies overestimate effects by failing to control for other capital inflows or endogeneity. Kharb et al. (2024) performed a meta-analysis of 43,861 observations from 97 studies

on investment determinants and environmental sustainability. They found evidence for the Pollution Haven Hypothesis: FDI, trade openness, and globalization tend to increase carbon emissions, whereas green innovation strongly reduces emissions. They also showed that institutional and regulatory quality significantly moderates these effects. In other words, the environmental impact of capital flows depends on governance.

Fan et al. (2019) meta-analyzed 694 estimates from 24 studies on FDI backward spillovers in China. They report substantial productivity gains for domestic suppliers: their best estimates suggest that a 10 percentage rise in foreign presence yields about a 10.6% increase in suppliers' production. However, spillovers vary widely by firm type and ownership. Notably, export-oriented JVs and joint ventures generate the largest backward spillovers, while wholly foreign-owned subsidiaries (WOSs) generate the least. Fan et al. (2019) used Bayesian Model Averaging meta-regression and found that attributes like foreign firm origin and whether local firms are technology-intensive explain much of the variation. This analysis highlights that in China's case, FDI can transfer technology locally, but benefits depend on how and where it enters. Yerrabati and Hawkes (2014) synthesized 633 estimates from 37 studies on FDI's impact on GDP in South, East Asia, and the Pacific. They found a significant positive overall effect of FDI on growth, even after correcting for endogeneity and publication bias. However, they also detected large regional differences: Southeast Asia shows a robust positive effect, whereas East Asia exhibits an insignificant or even slightly negative effect. The authors attribute this heterogeneity to factors like institutional quality and FDI type. For instance, China's rapid growth might have been driven by other factors so that marginal FDI appears less growth-enhancing. This meta-review thus cautions that aggregate FDI-growth findings may not apply uniformly: country-specific conditions matter greatly. It also exemplifies the critical meta task of exploring what study features systematically influence results.

Other meta-analyses support the importance of complementary conditions. Durham (2004) found that FDI and equity portfolio flows only spur growth when a country has sufficient absorptive capacity. Meyer and Sinani (2009) similarly reported a U-shaped pattern of FDI spillovers by income level, with middle-income countries often seeing crowding-out rather than positive spillovers, due to technology gaps. Havranek and Irsova (2012) meta-analyzed horizontal spillovers and found them generally small and context-dependent, where joint ventures yield more spillovers than wholly-owned firms, and spillovers are smaller in more open economies. Finally, Anwar and Iwasaki (2022) meta-examined how host-country institutional quality affects FDI inflows from BRICS nations; they found the effect was modest, and emerging-market investors are often less deterred by weak institutions than Western firms. Arestis et al. (2015) conduct a meta-analysis of 1,151 estimates and find a moderate but positive link between financial development and economic growth. The effect varies by data type, financial indicators used, and endogeneity controls, highlighting the relationship's sensitivity to methodological choices. The PRISMA-guided systematic approach of Farzam et al. (2025) pointed out that existing findings on FDI, institutional quality, and finance remain ambiguous and contradictory, partly due to varied methods and scopes. In short, meta-analysis highlights that any policy on liberalizing capital flows must consider the national context.

1.3. Systematic reviews

Systematic literature reviews (SLRs) apply explicit protocols to search and synthesize studies qualitatively. They offer depth and transparency but can be labor-intensive and still subject to author selection biases. Islam and Beloucif (2023) present a textbook SLR of 112 studies on FDI determinants. Following the Denyer and Tranfield method, they categorized factors by study type and region. Consistent with empirical findings, they report market size as the strongest determinant, since most FDI is market-seeking. They also emphasize infrastructure quality and macro stability. Notably, their review places trade openness and human capital high among determinants, aligning well with the variables of interest in our research question. This SLR is valuable because it systematically collates literature findings and suggests that, for China's FDI, its large market and improving infrastructure have been key attraction factors. A

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limitation, as with most SLRs, is that it depends on search keywords and databases; very new studies or non-English work may be underrepresented.) FDI generally supports growth, though its impact depends on factors like labor, trade liberalization, and institutional quality (Almfraji and Almsafir 2014). Igan et al. (2020) show that capital inflows boost industry growth in emerging markets, especially through equity, but their effects weaken during crises and depend on financial institutions. Park and Yang (2021) reveal that capital network centrality enhances growth in stable times but spreads shocks during crises, emphasizing the need for strong macroprudential policies.

Koepke (2015) offers a classic narrative survey and augmented push-pull framework of capital flow drivers. He concludes that global factors strongly drive volatile portfolio flows, whereas domestic factors dominate FDI. In particular, FDI is relatively insensitive to global risk sentiments, implying it is driven by longer-term domestic fundamentals. His "push vs pull" classification remains influential, and he cautions that much empirical work overemphasizes cyclical drivers at the expense of structural ones like institutional quality and financial depth. For China, this suggests that while short-term flows may spike with global ebbs and flows, long-run FDI growth depends more on enduring domestic reforms. Koepke's review is qualitative, so it does not produce pooled estimates, but it does critically assess methodologies and highlights neglected factors. Other SLRs focus on niche topics but reinforce our themes. For instance, Bumann et al. (2013) meta-reviewed finance liberalization studies and found positive growth effects on average but noted that effects weaken in countries with already developed financial systems, implying that China's continued liberalization may yield only modest gains unless complemented by reform. An SLR by Cazachevici et al. (2020) on remittances similarly highlights the need to control for co-movements with other flows. These methodological critiques are important: they remind us that many published estimates may suffer omitted-variable or endogeneity biases.

Across bibliometric and systematic studies, two common caveats emerge. First, the choice of keywords and databases determines which articles enter the review (a known bias in SLRs). For example, Farzam et al. (2025) relied on WoS/Scopus and Biblioshiny, which may omit conference papers or local journals. Second, bibliometric tools like VOSviewer or co-citation mapping produce visually appealing clusters, but their interpretation can be somewhat subjective, and they tell us "what's hot" rather than "what's true." PRISMA-driven reviews mitigate some selection bias but still require careful screening. Lastly, meta-analyses depend on the quality of underlying studies: publication bias tends to overstate positive findings and diverse estimation techniques across studies can inflate heterogeneity. We must therefore interpret aggregated effects with caution.

Combining these strands yields several insights into long-run capital flows to China. Bibliometric analyses indicate that China is a dominant player (often among the top publishers and collaborators) in the global FDI and capital flows literature. Core topics include institutional and financial quality, trade openness, and increasingly, sustainability. Systematic reviews and meta-analyses suggest that domestic absorptive factors condition the growth impact of these flows: for instance, studies repeatedly find that without sound institutions and deep financial markets, FDI's growth effects are muted. China's experience echoes this – its massive FDI inflows in the 1990s paid off only after significant financial and legal reforms. Meta-analyses reinforce that the relationship between capital flows (FDI, portfolio, debt) and growth is context-dependent: positive on average but heterogeneous, with weaker or even adverse effects in the absence of strong absorptive capacity. From a methods perspective, our review reveals that rigorous PRISMA-style screening is feasible for broad topics like "capital flows" (Farzam et al., 2025), but researchers must be transparent about inclusion criteria and potential biases. Bibliometric maps should be interpreted as mapping exercises and supplemented by content analysis for nuance. In reporting future work, scholars should explicitly address heterogeneity and endogeneity. The convergence of bibliometric, meta-analytic, and systematic review evidence paints a complex picture: Long-term capital movements into China have broadly supported economic growth, but this relationship is non-uniform. Key drivers of these flows include China's large market, improving infrastructure, and gradually liberalized finance, while institutional quality and global conditions modulate their effectiveness.

This collection of studies reveals the complex interplay between FDI, technological advancement, financial development, and economic policy across diverse contexts. Central findings highlight that FDI enhances productivity, innovation, and resource optimization, particularly in capital-intensive and high-tech industries. However, challenges, such as the digital divide, income inequality, and limited technology spillovers in labor-intensive sectors, still persist. Furthermore, while FDI fosters technological progress and economic growth, it may exacerbate competition and negatively impact export quality and domestic firm productivity. The moderating roles of financial development, trade openness, and governance quality are also evident, with administrative and institutional barriers impeding optimal outcomes. Despite the wealth of insights, notable research gaps remain. Key limitations include regional and sectoral biases, insufficient exploration of FDI's long-term impacts, and the absence of granular data on entry modes and industrial linkages. Additionally, the nuanced effects of digital finance, policy uncertainty, and infrastructure disparities require further examination. Addressing these gaps could inform more targeted strategies to maximize FDI's developmental impact and foster sustainable economic integration. Therefore, this study aims to systematically analyze and synthesize the existing scientific literature on the determinants of long-term capital flows, particularly Foreign Direct Investment (FDI) into China, with a focus on how prior empirical studies examine the roles of trade openness, infrastructure development, institutional quality, and financial modernization.

2. METHOD

This study explored the relationship between long-term capital flows, their key determinants, and their impact on China's economic growth. To maintain a structured and systematic approach, the research utilized the PICOS framework (Population, Intervention, Comparison, Outcomes, and Setting) to formulate research questions and classify data. This framework ensures alignment between the collected data and research objectives, enabling a thorough analysis to identify the intricate link between foreign capital movement and economic development in China. This study organizes keywords into three hierarchical levels. The top level represents the main concept, Long-term capital flow, with sub-keywords like FDI, portfolio investment, and external debts. The middle level focuses on the outcome, China's economic growth, with sub-keywords like China GDP growth and Chinese economic development. Finally, the bottom level explores factors that influence capital flow, such as capital flow determinants, exchange rates, and capital flow. This structure helps organize and refine search queries for information related to the impact of long-term capital flow on China's economic growth.

2.1. Search strategy

Table 1 presents the benchmark of inclusion and exclusion with PICOS. Studies that matched PICOS criteria were included in the analysis. Conversely, we excluded studies if they did not meet all inclusion criteria. By ensuring the inclusion of only relevant and high-quality studies, this framework enhanced the rigor and validity of the research findings.

Bibliometric analysis was conducted using the Bibliometrix package in the R statistical environment (version 4.3.1). Biblioshiny, a web interface included in Bibliometrix, was employed to facilitate the data analysis process through an interactive platform (see Table A5). This command starts a local Shiny server and opens Biblioshiny in the default web browser (e.g., at http://127.0.0.1:7075). The application provides a graphical interface that enables users to upload bibliographic datasets (e.g., Scopus, Web of Science, and Dimensions), preprocess them, and perform a wide range of bibliometric and scientometric analyses, including descriptive statistics, citation analysis, co-authorship networks, and conceptual structure mapping. All analyses and visualizations reported in this study (e.g., keyword co-occurrence networks, thematic evolution, and citation impact) were generated using Biblioshiny. The outputs were then exported as tables and figures to support interpretation and discussion.

The bibliographic dataset was retrieved from the Web of Science (WoS) Core Collection using the Advanced Search function (see Table 2). To ensure both rigor and relevance, a series of refine-

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Table 1. Benchmark of inclusion and exclusion with the PICOS framework

Element	Inclusion Criteria	Exclusion Criteria
Population (P)	Studies focusing on China's economy in relation to international capital flows (FDI, portfolio equity, bonds, external debt, and remittances).	Studies not related to China (e.g., global/regional analyses without China-specific findings).
Intervention / Exposure (I)	Long-term capital inflows and their determinants: trade openness, institutional quality, infrastructure, financial development, and digitalization.	Short-term capital movements (e.g., speculative flows, hot money), purely monetary/FX flows without a link to growth.
Comparison (C)	Comparative analyses of different types of capital flows, regional differences within China, or cross-country comparisons including China.	Studies without a clear comparison of capital types or without a measurable link to economic outcomes.
Outcomes (O)	Economic growth outcomes: GDP growth, productivity, innovation, trade, employment, regional development, and financial stability.	Outcomes not related to economic growth (e.g., purely political/ideological debates without economic indicators).
Study Design (S)	Peer-reviewed empirical studies, bibliometric analyses, review articles, and meta-analyses. Published in English, indexed in WoS (SCI-EXPANDED, SSCI, ESCI) between 1990–2025.	Non-peer-reviewed sources (e.g., working papers, reports, dissertations, conference abstracts), non-English, outside 1990–2025.

Table 2. Complete Web of Science search query

Search Component	Field Code	Search Criteria
Document Type	DT	Article/ review
Language	LA	English
Web of Science Categories	WC	Economics OR Business OR Management OR Business Finance
Source Titles	SO	See Appendix B for the complete list of 87 journals
Subject Area	SU	Business Economics
Country/Region	CU	Peoples R China
Publication Years	PY	1990-2025

Note: The Web of Science Core Collection was searched on July 26, 2025.

ment criteria was applied. First, the search was restricted to document type: "Article" and language: English. Second, only records indexed under the Web of Science Categories of Economics, Business, Management, or Business Finance were considered. Third, to capture research at the intersection of international trade, growth, and business studies, the query was further limited to articles published in leading peer-reviewed journals, such as Journal of International Business Studies, Economic Modelling, Energy Economics, Research Policy, World Development, Ecological Economics, American Economic Review, among others.

Geographic focus was ensured by restricting results to publications with authors affiliated with the People's Republic of China (CU = PEOPLES R CHINA). The temporal scope of the dataset was defined as 1990–2025, covering the most recent 35 years of scholarly output. Finally, the research area filter Business Economics was applied to narrow the scope to relevant disciplinary contributions. This query yielded a total of N = 639 bibliographic records, which were subsequently exported in plain text format for analysis in the R package Bibliometrix and its Shiny-based application Biblioshiny.

2.2. PRISMA model

Key bibliometric statistics related to research output from 1990 to 2025 show that 639 documents were published through 56 sources, where the annual growth rate was 12.91%. A total of 780 authors contributed to these works, with 2.96 co-authors per document, but international co-authorship was limited, with the corresponding authors predominantly based in China, contributing 82.3% of the publications (see Table A3 of Appendix). Keywords, references, and average citations per document are notably minimal, indicating limited bibliometric depth in terms of citation and reference density. However, each document received an average of 21.1 citations, which suggests a moderate level of research impact.

In the systematic review (Figure 1), 639 studies were identified from databases (Web of Science). After screening, 483 studies were removed, as

they did not satisfy the inclusion requirements. All 156 studies sought for retrieval were successfully located and determined to be eligible for inclusion in the study. During the eligibility phase, 42 studies were excluded due to wrong settings (22), wrong indications (12), or unsuitable study designs (8). Ultimately, a total of 114 studies were finalized to include in this study. The PRISMA diagram in Figure 1 clearly outlines the study selection process and highlights potential areas of bias. The search strategy utilized broad keywords, ensuring a comprehensive inclusion of articles focused on the relevant research topic. All included studies underwent peer review and aligned with the analysis criteria.

2.3. Study selection and screening process

The study selection process followed the PRISMA 2020 statement guidelines. Search results from Web of Science were exported in plain text and BibTeX format and imported into the Rayyan online systematic review platform for screening and deduplication. Automatic deduplication was first performed within Rayyan, followed by a manual check to ensure all duplicates were eliminated before the screening phase. Two independent reviewers (Reviewer Hossain and Reviewer László) conducted the screening process, where Hossain is a doctoral researcher, and László is a senior re-

Source: Prisma diagram.

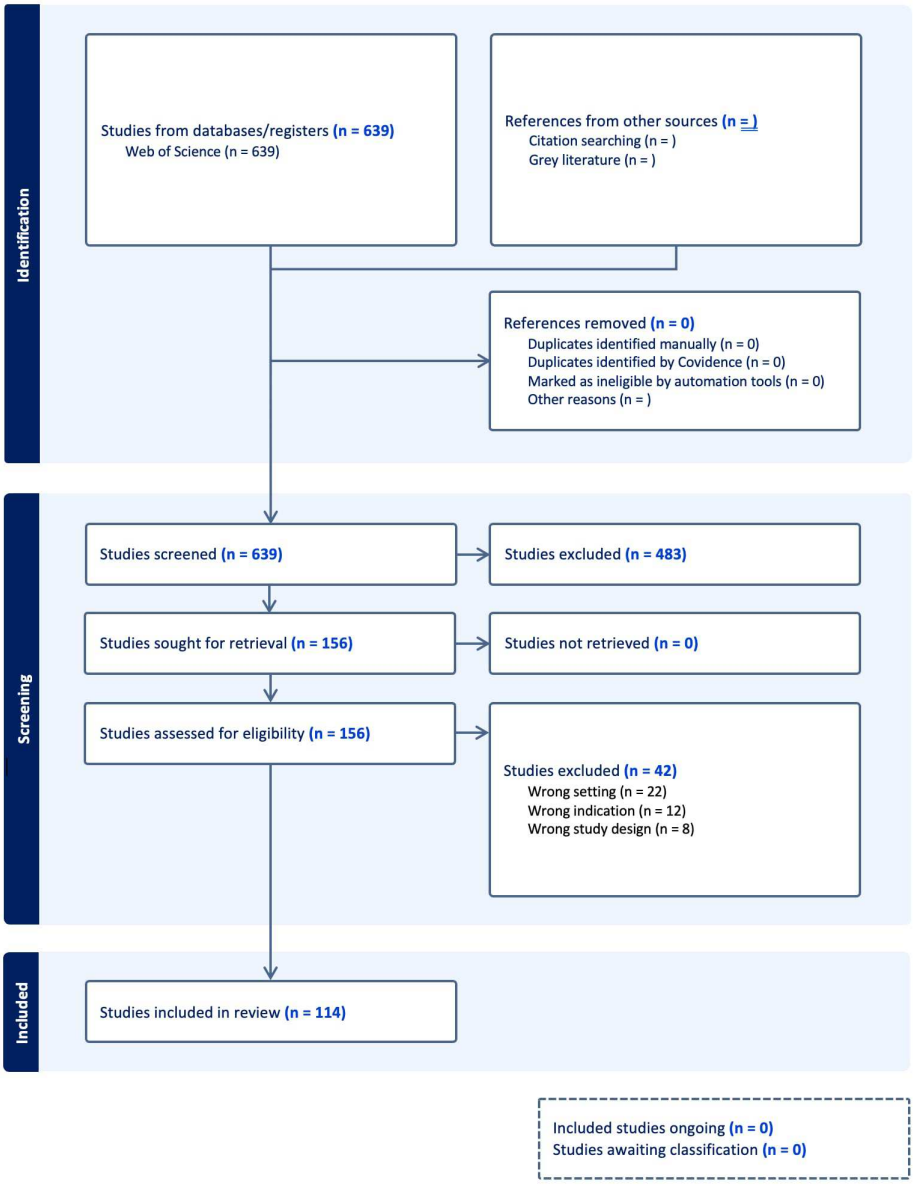

Figure 1. PRISMA model

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searcher with expertise in international economics and finance. Before formal screening, a calibration exercise was conducted on a random sample of 50 records to ensure a consistent understanding of the inclusion and exclusion criteria. The screening was performed in two steps. First, both reviewers screened titles and abstracts for selected articles using the pre-defined eligibility criteria (Table 1). Records marked as "include" by either reviewer were promoted to the full-text screening stage. As a second step, full-text articles of all studies identified as potentially relevant during the abstract screening phase were successfully retrieved for thorough evaluation.

2.4. Extraction of data and quality appraisal

A uniform data extraction form was developed in Microsoft Excel to gather key information from the selected studies, such as author(s), publication year, journal, study objectives, type of capital flow studied, methodology, key findings, and context (e.g., national, regional, firm-level). Given that the primary aim of this review was to provide a bibliometric and systematic mapping of the literature rather than a statistical synthesis of quantitative results, we acknowledge and discuss the potential for several biases inherent in the methodology:

Database Bias: The reliance solely on Web of Science may have omitted influential studies published in journals not indexed in this database or in other publication types (e.g., books, reports from international organizations).

Language Bias: The restriction to English-language articles excludes relevant research published in Chinese and other languages, potentially skewing the thematic coverage.

Publication Bias: The corpus likely over-represents studies with positive or statistically significant findings, as null results are less frequently published.

Citation Bias: Bibliometric analyses are inherently influenced by citation practices, where older or highly cited papers gain more visibility, potentially at the expense of newer or more niche contributions. These biases are considered a limitation of the present study and are further discussed in Section 7.

2.5. Bibliometric analysis

The final corpus of 114 included studies was exported from Rayyan and analyzed using the Bibliometrix package in R software 4.3.1. The analysis encompassed both performance analysis (publication trends, core sources, influential authors) and science mapping (co-word analysis, conceptual structure, thematic evolution, collaboration networks).

3. RESULTS

Figure 2 presents bibliometric indicators capturing annual citation trends for research on long-term capital inflows and their impact on Chinese

Source: Bibliometrix package generated in R programming and presented using an Excel graph.

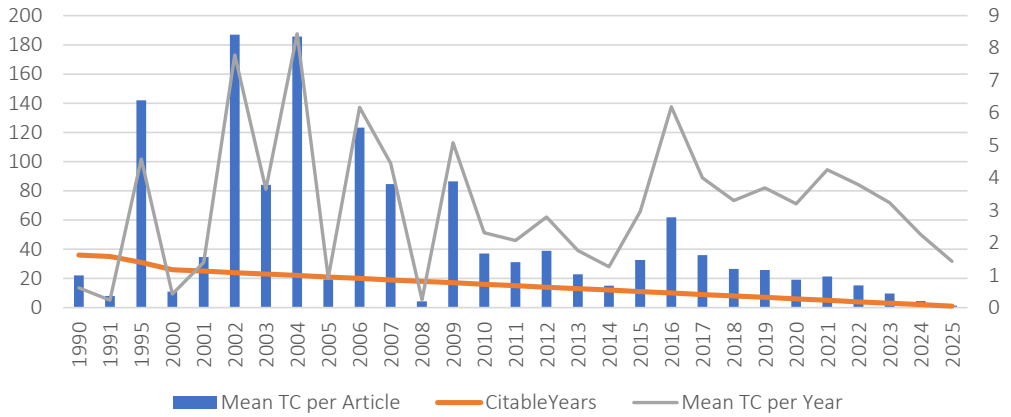

Figure 2. Citation trends in long-term capital flow research and their impact on economic growth over time

Source: Bibliometrix package generated in R programming.

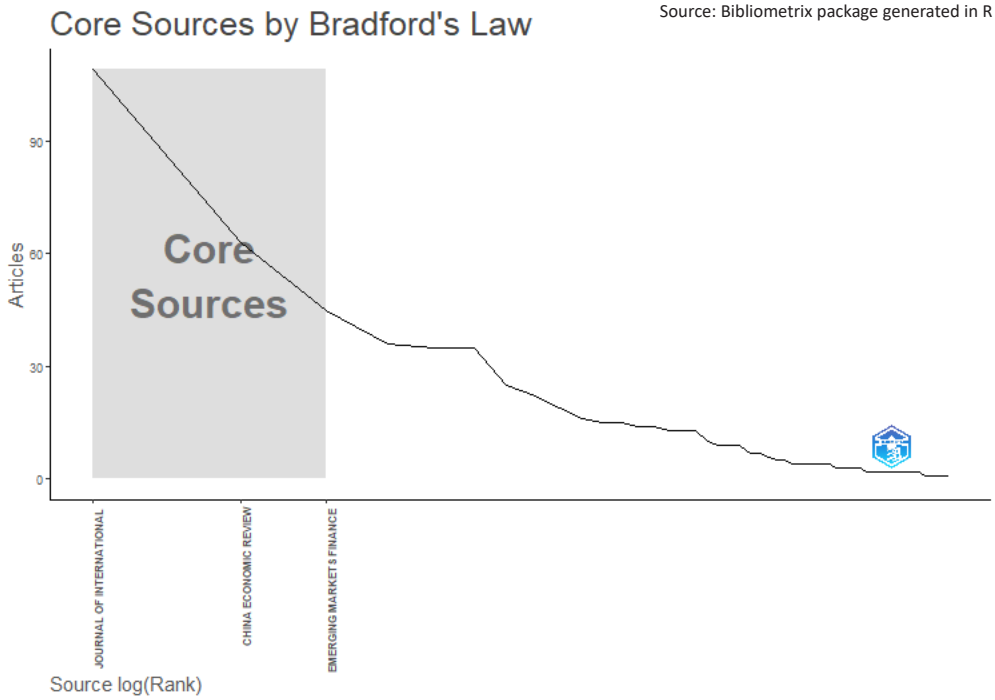

Figure 3. Bradford's Law presenting core sources on long-term capital inflows and their interaction with economic growth

economic growth. Three key metrics are shown: Mean total citations (TC) per article, presenting the average number of citations; Citable Years indicating the number of years a publication has been available for citation since its publication date; and Mean TC per Year showing the total years a publication has been available for citation (current year minus publication year). Mean TC per Article reflects the average number of citations per publication in a given year, with notable peaks in 2002 (187), 2004 (185.67), and 1995 (142), indicating periods of high-impact publications. Peaks in citation averages are observed in the early 2000s, particularly around 2003–2004, indicating periods of heightened scholarly attention. Citable Years showing a steady decline from 36 years in 1990 to just 1 year in 2025, consistent with recency effects. Mean TC per Year shows average annual citation rates, peaking in 2004 (8.44), 2002 (7.79), and 2016 (6.19), suggesting heightened scholarly attention during these periods.

Bradford's Law states that a small number of sources contribute to a disproportionately large number of articles. Figure 3 shows a steep initial decline, indicating that a few core sources account for a significant portion of the articles. The shaded area highlights the core sources, emphasizing their importance in research. This visualization demonstrates that researchers can focus their efforts on a limited number of core sources to access a significant portion of relevant literature, thereby improving efficiency and effectiveness in their research endeavors.

In Figure 4, FDI appears as a central hub, connected to a wide range of concepts. This suggests that FDI is a key concept with strong associations across various economic domains. This study observes connections between FDI and other crucial factors like economic growth, human capital, technology spillovers, trade, and competition. This network visually highlights the interconnected nature of these concepts and their relevance in understanding FDI's interaction with the global economy. Therefore, the network provides a valuable tool for researchers to explore the complex relationships between different economic concepts and identify potential research avenues based on co-occurrence patterns.

Table 3 presents the thematic dimensions and associated keywords that frame the study of long-term capital flows and economic growth in China. These themes directly correspond to the research questions and highlight the factors, mechanisms,

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Source: Bibliometrix package generated Co-Occurrence Network in R programming.

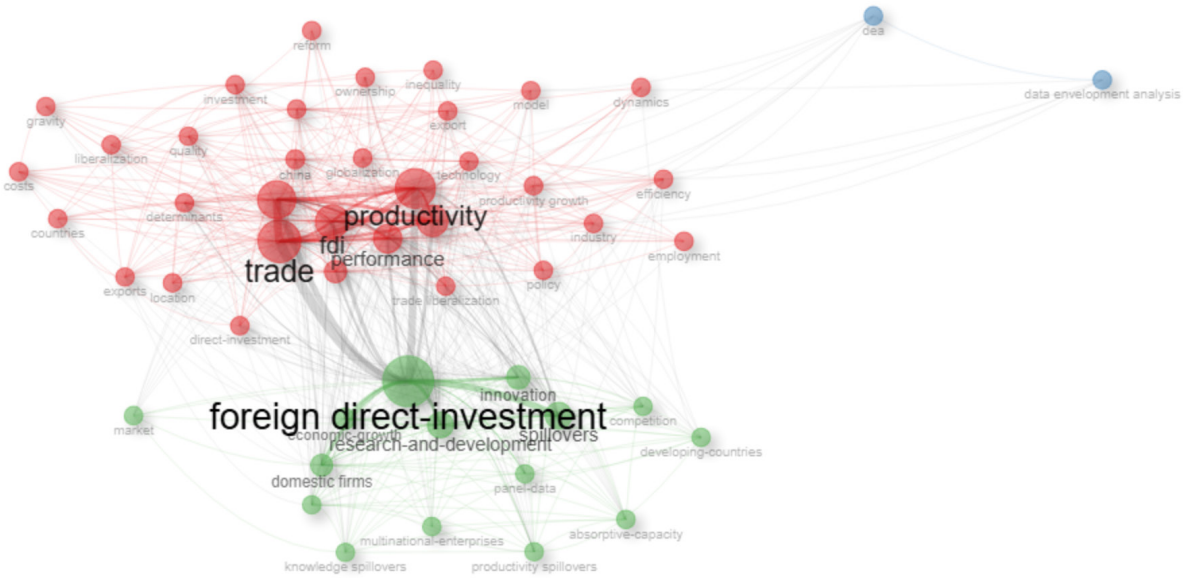

Figure 4. Keyword co-occurrence network map of research on long-term capital flows and economic growth in China

and outcomes most relevant to the analysis. The categorization provides a conceptual foundation linking keywords to the broader dynamics of capital inflows and economic development. There is a clear upward trend in article production, with a significant jump from 124 publications in the UK to 1,855 in China. The trend continues with a gradual decrease in the number of articles for subsequent regions, indicating a decreasing level of research output. The cumulative occurrences of selected keywords over time, likely extracted from academic literature or news sources. Key terms like FDI, Economic Growth, and China have shown a consistent upward trend, indicating increasing research attention. Human Capital and Innovation also exhibited an increasing growth, suggesting a growing focus on their role in China's development. "Average Citations per Year" illustrates the annual citation trends of a particular academic topic or set of publications from 1990 to 2025. The data reveals significant fluctuations, with notable citation peaks around 2002, 2004, and 2006, where average citations exceeded 8 per year, indicating close academic attention during that period. Following 2008, citation rates generally declined, showing smaller spikes in 2016 and 2021. The most recent years (2023–2024) reflect a sharp drop, possibly due to the recency of publications that have not yet accumulated citations. Overall, the graph suggests that while scholarly interest was intense in the early 2000s, it has tapered off in recent years. Figure 4 illustrates author productivity following Lotka's Law, showing that most authors contributed only one publication. As the number of documents written increases, the percentage of contributing authors drops sharply.

Table 4 summarizes the major thematic clusters identified in the literature on long-term capital movements and their influence on China's economic growth. Each cluster reflects a distinct research focus derived from keyword co-occurrence,

Table 3. Keyword themes informing the analysis of long-term capital flows and economic growth

Themes	Keywords
Capital Flow Drivers	FDI, Portfolio Investment, Macroeconomic Trends, Policies, Interest Rates, Exchange Rates, Risk, Regulation, Political Stability, Economic Growth, Financial Development
Trade & Institutional Impact	Trade, Infrastructure Development, Institutional Quality, Economic Growth, Technological Advancement, Productivity, Innovation, Global Value Chain, Belt and Road Initiative
Finance & Digitalization	Financial Development, Digitalization, Efficiency, Equity, Regional Disparities, Sectoral Outcomes, Financial Inclusion, Income Inequality, Human Capital, Education

Note: Themes are derived from the research question in relation to keywords.

Table 4. Thematic clusters of long-term capital flow literature

Theme	Link with capital flow	Authors
Trade openness & Export	By fostering trade liberalization, FDI has enabled Chinese firms to integrate into global markets, improve export capacity, and gain access to foreign technology and practices.	Kong et al. (2021); Saidi et al. (2020); Rehman et al. (2020); Sun et al. (2020); Bao et al. (2022); Ng et al. (2022); Yang et al. (2021); Liu et al. (2024); Cai and Hao (2025); Chen et al. (2025); Fan et al. (2025); Iftikhar et al. (2025); Kong et al. (2025); Li and Jiang (2025); Peng and Deng (2025); Shu et al. (2025); Ul-Haq et al. (2024); Xiaoli et al. (2025); Xiong et al. (2025); Zheng (2025); Zhu et al. (2025)
Economic Growth/ Development	This theme explores the direct and indirect effects of capital inflows on China's macroeconomic growth.	Zhang and Zhang, (2023); Deng et al. (2023); Yu et al. (2024); Liu et al. (2020); Huang et al. (2021); Wang et al. (2022); Song et al. (2021); Zhang and Wang (2021); Wang et al. (2020); Yang et al. (2022); Majeed et al. (2021); Fan et al. (2023); Binder et al. (2024); Liu and Zhang (2020); Wang et al. (2024); Li et al. (2023); Zhang and Yan (2022); Zhou and Latorre (2021); Lombardi et al. (2022); Davis et al. (2021); Chen, Dong et al. (2025a); Fang et al. (2025); Garred and Yuan (2025); Glushenkova (2025); Hou et al. (2025); Huang, Cui et al. (2025); Lin et al. (2025); Peng and Zhong (2025); Yu and Liu (2025); Zhang et al. (2025); Wang and Wu (2021)
Productivity	FDI brings not just capital, but also managerial know-how, technology, and organizational innovations. These factors enhance the efficiency and productivity of both foreign-invested enterprises and their domestic counterparts through spillover effects, particularly in manufacturing and high-tech sectors.	Han et al. (2022); Li et al. (2020); Lin et al. (2020); Gao et al. (2024); Wang and Liu, (2023); Tang and Zhang (2021); Yao and Salim (2020); Wang and Chen (2024); Yu et al. (2024); Huang et al. (2025); Liang et al. (2025); Liu et al., (2025), Huang et al. (2025); Niu et al. (2025); Wen et al. (2025); Chen et al. (2025)
Technology & Spillovers	This theme captures how capital movements act as conduits for upgrading China's technological base, a vital driver for sustained economic growth.	Li et al. (2024); Gong and Zhang (2023); Ning et al. (2023); Zhou (2021), Feng and Li (2021); Zheng and Wu (2024); Ding et al. (2024); Guo et al. (2022); Mai et al. (2025); Wang et al. (2025); Wang, Li et al. (2025)
Firms' structure, level & size	FDI affects firms differently depending on their size, sector, and ownership. Larger or export-oriented firms are more likely to attract and utilize foreign capital effectively. This theme examines structural adjustments in Chinese enterprises in response to foreign capital inflows, highlighting firm growth, competition, and industrial consolidation.	Min et al. (2022); Chang and Chen (2021); Feng and Wen (2023); Hsu et al. (2023); Wang et al. (2020); Rong et al. (2020); Huang et al. (2023); Feng et al. (2022); Shah et al. (2020); Chen et al. (2020); Dai and Tian (2021); Lu et al. (2020); Walheer and He (2020); Min et al. (2022); Hong et al. (2025); Cao et al. (2025); Zhang et al. (2025)
Innovation & digitalization	This theme links capital flows with advancements in digital infrastructure and innovation capacity, which are now central pillars of China's high-quality growth strategy.	Deng et al. (2024); Gou et al. (2024); Liu and Walheer (2022); Kou et al. (2022); Zhong and Ma (2024); Okubo and Watabe (2023); Guo et al. (2021); Lu et al. (2024); Chen et al. (2022); Xu et al. (2024); Ma et al. (2024); Zhang (2021); Ke et al. (2025); Lee and Zhao (2025); Li et al. (2025); Liu et al. (2025); Qiao et al. (2025); Wang et al. (2025)

revealing how scholars have conceptualized the roles of FDI, financial development, trade, infrastructure, institutional quality, and digitalization. These clusters align with the key channels through which capital flows impact China's macroeconomic and structural transformation.

Figure 6 identifies key concepts like FDI, Trade, Economic Growth, Financial Development, Human Capital, Technological Innovation, and Income Inequality. These concepts are represented as nodes on the map. Lines or arrows connect these nodes to depict the relationships between them. For instance, there is a strong link between FDI and Technological Innovation, as FDI often brings advanced technologies.

The relevance of sources suggests that The Journal of International Trade/Economics emerges as the most significant source, contributing 109 documents, far surpassing the others. Other notable sources include the China Economic Review with 63 documents and Research in Emerging Markets Finance and Trade with 45 documents, and Economic Modeling with 36. Mid-tier sources range from the International Review of Economics and Finance (35 documents) to World Economy (25 documents). A sharp drop in document contri-

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Source: Bibliometrix package generated Author Productivity in R programming.

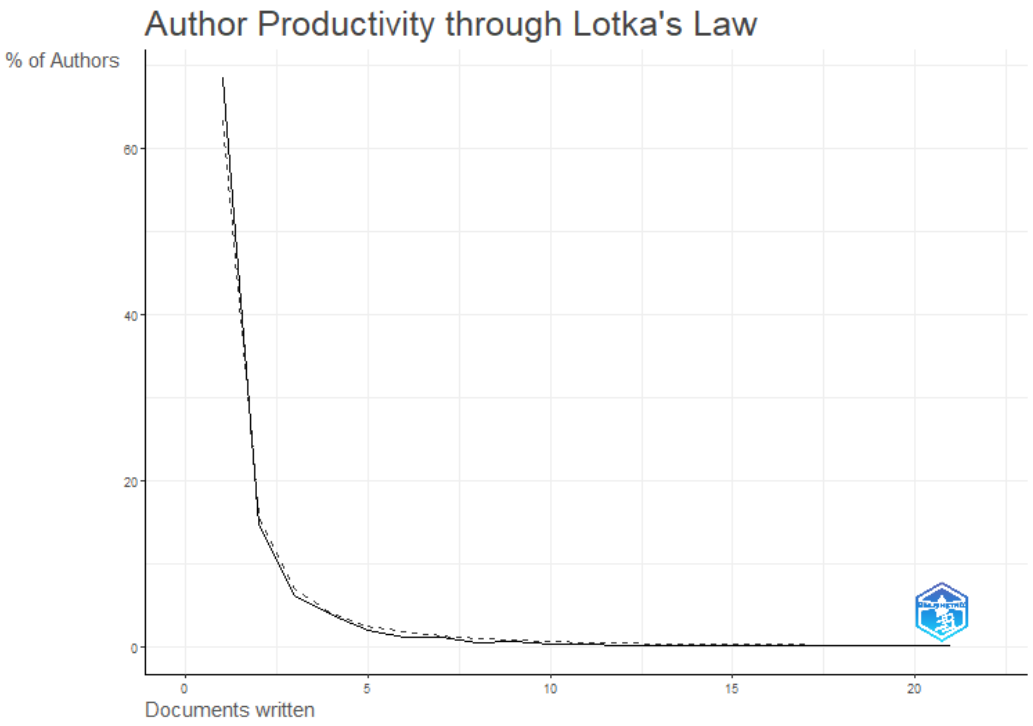

Figure 5. Author productivity distribution based on Lotka's Law

Source: Bibliometrix package generated Factorial Analysis in R programming.

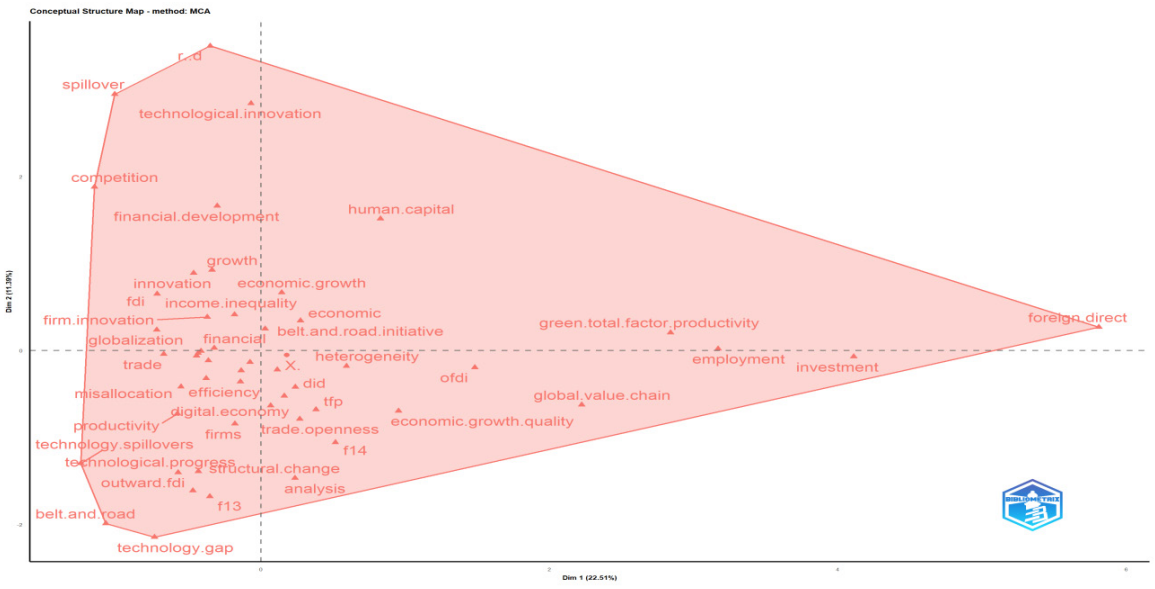

Figure 6. Conceptual structure map of research on long-term capital flows and economic growth based on factorial analysis

butions beyond the top three sources underscores their dominant significance.

Figure 7 presents themes that include FDI inflows, trade liberalization, human capital development, technology innovation, income inequality, and economic growth. Thematic Maps visually represent these themes as nodes on a map, where node size reflects the frequency or importance of each node within the corpus. Lines or edges connect related themes, indicating their relationships and interdependencies. By analyzing the map, re-

Source: Bibliometrix package generated Thematic Maps in R programming.

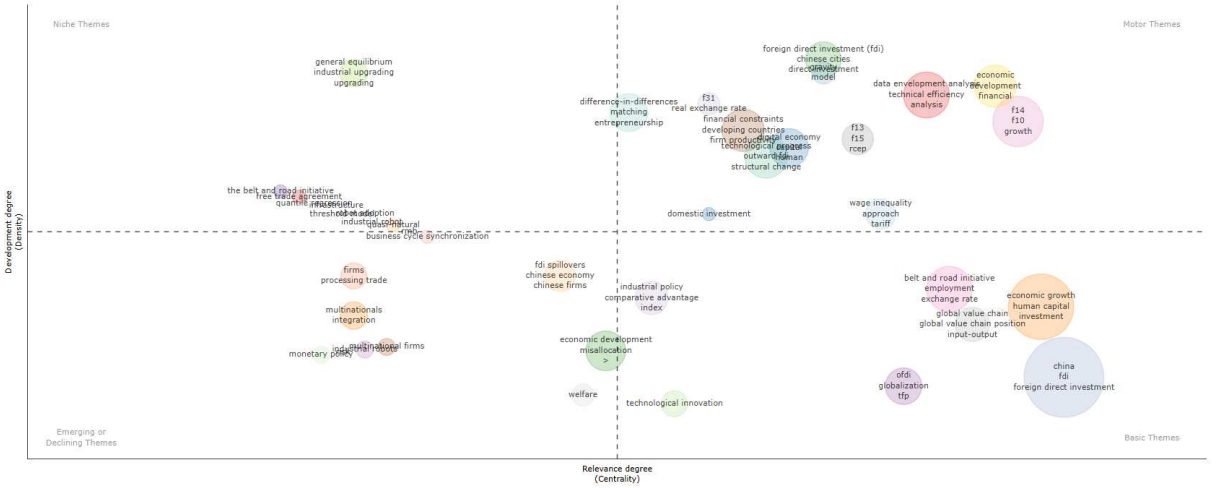

Figure 7. Thematic map of research on long-term capital flows and economic growth

searchers can identify key clusters of themes and emerging or declining themes, and understand the factors driving China's economic growth due to long-term capital movements.

Based on the Tree Map (Table 5, the articles published in the reviewed literature primarily focus on key themes such as FDI (254), Economic Growth/Development (181 mentions), and Trade (146), which indicates a strong research interest in the role of capital flows and macroeconomic performance in the Chinese context. Other frequently explored topics include Human Capital, Financial Development, and Innovation, which reflect a growing emphasis on productivity, technology, and inclusive growth. Emerging themes, such as the Digital Economy, Belt and Road Initiative, and Technological Innovation, also feature prominently, pointing to evolving research trends.

Figure 8 presents the analysis for the corpus of article publications, including journal articles and conference papers published over a period of time. Trend Topics analysis can identify which terms and concepts are gaining prominence or declining in relevance. Conversely, it might show a decline in research focusing on specific aspects of financial liberalization. By visualizing these trends, researchers can acquire valuable insights into the dynamic nature of the research landscape and identify emerging areas of scholarly investigation, and anticipate future directions in the field.

Figure 9 presents the thematic evolution of research topics on long-term capital flows and their relationship to economic growth over four distinct periods: 1991–2016, 2017–2020, 2021–2023, and 2024–2025. From 1991–2016, key themes included exchange rates, firm heterogeneity, and international trade, which evolved into a stronger focus

Table 5. Tree map, presenting the frequency of key terms in long-term capital flow literature

Source: Bibliometrix package generated Thematic Maps in R programming.

Term	Frequency	Term	Frequency
FDI	254	Export	64
Economic Growth/Development	181	Technology	38
Trade	146	Determines	37
Productivity	119	Investment	30
Performance	76	Competition	29
Spillovers	62	Policy	26
Innovation	61	Trade Liberalization	24
R&D	60	Technology Transfer	22
Firms	57	Productivity Growth	21
Domestic Firms	46	Knowledge Spillovers	17
China	44	Liberalization	15

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Source: Bibliometrix package generated Trend Topics in R programming.

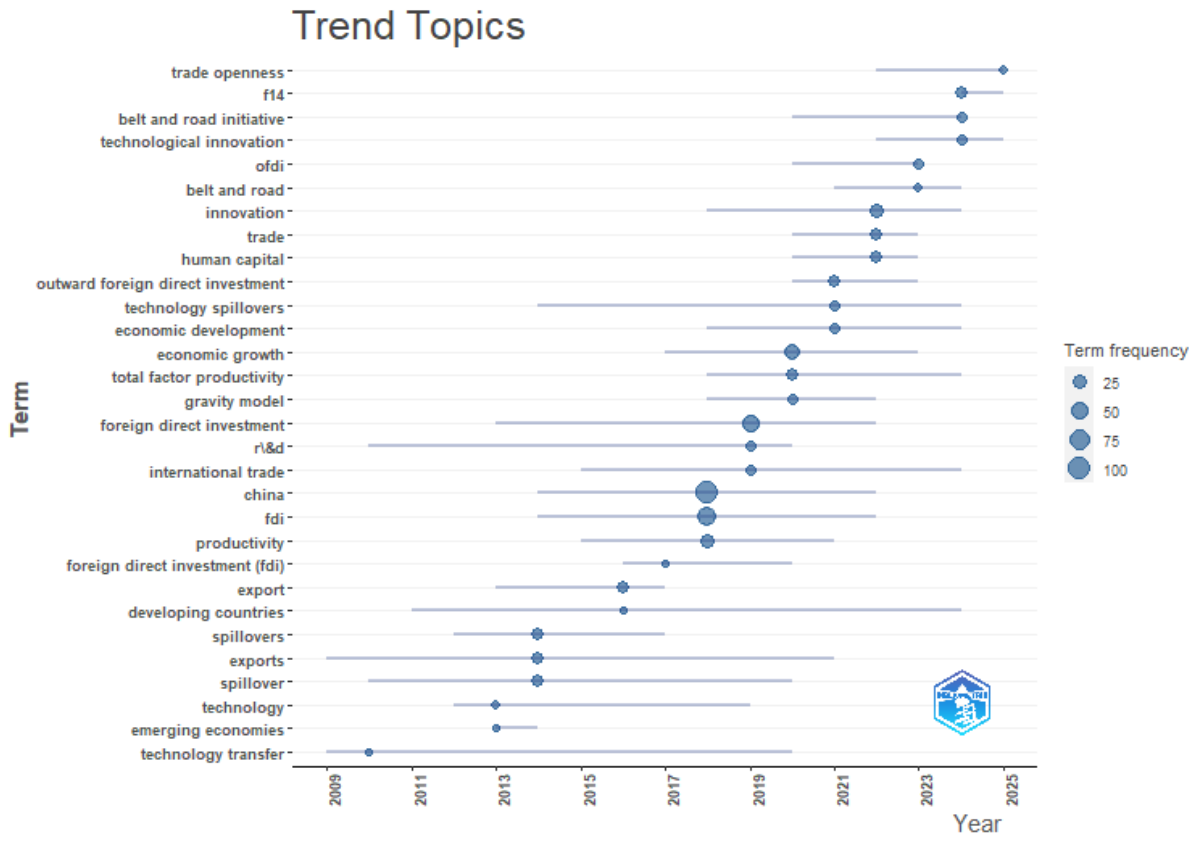

Figure 8. Trend analysis of key terms in research literature

Source: Bibliometrix package generated Thematic Evolution in R programming.

Figure 9. Thematic evolution of research on long-term capital flows and economic growth

on economic growth, free trade, technological progress, and exchange rate analysis from 2017 to 2020. The 2021–2023 period shows diversification into empirical and firm-level studies, with emphasis on human capital, panel data, mechanism analysis, and positive impacts. Finally, in 2024–2025, research trends converge toward more applied and region-specific themes such as digital economy, eastern regions, manufacturing firms, technological innovation, and a continued focus on economic growth and panel data. This progression highlights a shift from foundational macroeconomic variables toward more micro-level, empirical, and regionally focused investigations, reflecting the growing complexity and specialization of the field.

4. DISCUSSION

This study explored the critical role of long-term capital flows by highlighting how FDI and portfolio investment play a primary role in the growth of the Chinese economy. The research questions focused on the determinants of these flows, their interaction with macroeconomic trends, and the interaction of trade liberalization, infrastructure development, institutional quality, financial development, and digitalization. The PRISMA framework was utilized to systematically review studies from 1990 to 2025, ensuring the inclusion of high-quality, peer-reviewed literature that aligns with these objectives. Among the 639 studies identified, 114 met the inclusion criteria, highlighting a strong focus on FDI's interaction on economic development, technological innovation, and manpower development. Bibliometric analysis underscored the growing interest in research, as reflected in an annual growth rate of 12.91%. Most articles were published in China; however, the limited presence of international co-authorship highlights opportunities for expanding global research collaboration.

The findings revealed that trade openness, infrastructure advancements, and institutional quality significantly shaped the effectiveness of long-term capital flows in fostering economic growth. For instance, FDI emerged as a central node in the co-occurrence network (Figure 4), which linked it to pivotal concepts, such as technology transfer, competition, and regional economic integration. Thematic maps (Figure 7) and factorial analysis (Figure 6) further illustrated how these factors intertwined, emphasizing the importance of institutional reforms and infrastructure modernization in attracting and efficiently utilizing capital flows. Moreover, regions with robust governance and trade liberalization policies demonstrated higher capital absorption capacity, resulting in accelerated economic development. This dynamic underscored the interplay between policy frameworks and external investments, highlighting the strategic role of macroeconomic stability in fostering sustainable growth.

The analysis also highlighted financial development and digitalization as transformative forces in enhancing the productivity of long-term capital flows. Digitalization, for instance, streamlines financial services, increases transparency, and fosters innovation. Financial development, as captured in the keyword co-occurrence network and trend topic analysis (Figures 7 and 8), reduces transaction costs and expands access to capital markets, ensuring equitable distribution of resources across regions. However, the findings also point to regional disparities, where underdeveloped financial systems and inadequate digital infrastructure hinder the full utilization of capital inflows. This emphasizes the need for targeted policy interventions to bridge these gaps, enabling inclusive economic growth.

The study's use of advanced bibliometric tools, such as Bradford's Law (Figure 3), thematic mapping (Figure 7), and trend analysis (Figure 8), provided a nuanced understanding of the evolving research landscape. Core sources, including the Journal of International Economics and China Economic Review, dominated the literature, reflecting their pivotal role in advancing knowledge in this domain. However, the uneven distribution of research output suggests that further exploration of underrepresented regions and themes, such as green finance and sustainable development importance, could provide a more comprehensive view. Moreover, this study underscored the multifaceted interaction of long-term capital inflows on economic growth, offering actionable insights for policymakers to optimize capital utilization and address regional inequalities.

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CONCLUSION

This comprehensive review examined the critical role of long-term capital flows, specifically FDI and portfolio investment, in shaping China's economic growth. The research delved into the determinants of these flows, their interaction with macroeconomic trends, and the influence of trade liberalization, infrastructure development, institutional quality, financial development, and digitalization. Employing the PRISMA framework, the study systematically reviewed 114 peer-reviewed articles published between 1990 and 2025, ensuring a rigorous and comprehensive analysis. Bibliometric analysis revealed a growing research interest in this area, with an annual growth rate of 12.91%; however, international co-authorship remains limited, and most articles were published in China. Moreover, the limited presence of international co-authorship highlights opportunities for expanding global research collaboration. The findings underscore the significant impact of trade liberalization, infrastructure development, and governance standards on the effectiveness of long-term capital flows in fostering economic growth. Thematic maps and factorial analysis further illustrate the intricate interplay between these factors, emphasizing the crucial role of institutional reforms and infrastructure modernization in attracting and efficiently utilizing capital inflows. Regions with robust governance and trade liberalization policies demonstrated higher capital absorption capacity, leading to accelerated economic development. This highlights the synergistic relationship between policy frameworks and external investments, emphasizing the strategic importance of macroeconomic stability for sustainable growth.

FUTURE DIRECTIONS

Despite its rigorous design, this review is subject to several limitations. The reliance on a single database (Web of Science) may introduce database and language biases, potentially omitting influential studies from other indexes or published in Chinese. Furthermore, as a mapping review, it did not formally assess the risk of bias in individual studies, and the overarching findings remain susceptible to the publication bias inherent in the underlying literature. In the future, researchers should investigate the nuanced impacts of diverse long-term capital inflows, beyond FDI and portfolio investment, such as sovereign wealth funds and private equity, external debts, and remittances. Another important area for research is which type of capital has the most significant relation with Chinese economic growth. Throughout this study, it is evident that only FDI and portfolio investment were analyzed to assess their impact on economic growth. Key sources of capital, such as debt, remittances, and national savings, were not included. Further research is needed to examine the growth effects of these additional investment types. Additionally, research should explore the evolving role of technology, particularly AI and blockchain, in shaping the future of capital inflows, including how they interact with financial stability, cross-border investment, and regulatory frameworks. Investigating the impact of geopolitical risks, such as trade wars and global pandemics, on the dynamics of long-term capital movement and their implications for China's economic growth is also critical. Furthermore, improving the methodological rigor of studies in this area should be a priority for future research. This includes incorporating more sophisticated econometric techniques, such as panel data analysis and machine learning algorithms, to address endogeneity issues, which may improve the accuracy of empirical findings.

AUTHOR CONTRIBUTIONS

Conceptualization: Md Kamal Hossain.
Data curation: Md Kamal Hossain.
Formal analysis: Md Kamal Hossain.
Funding acquisition: Md Kamal Hossain, Eszter Lukács, László Vasa.
Investigation: Md Kamal Hossain.
Methodology: Md Kamal Hossain.
Project administration: Md Kamal Hossain, Eszter Lukács, László Vasa.

Resources: Md Kamal Hossain, Eszter Lukács, László Vasa.
Software: Md Kamal Hossain.
Supervision: Md Kamal Hossain, Eszter Lukács, László Vasa.
Validation: Md Kamal Hossain.
Visualization: Md Kamal Hossain, Eszter Lukács, László Vasa.
Writing – original draft: Md Kamal Hossain.
Writing – review & editing: Md Kamal Hossain, Eszter Lukács, László Vasa.

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APPENDIX A

Table A1. Key bibliometric indicators for the most influential authors in capital flow and economic growth of China

Author	h_index	g_index	m_index	TC	NP	PY_start
LIU X	12	15	0.6	758	15	2006
ZHANG Y	11	21	0.64705882	462	21	2009
WANG C	9	11	0.47368421	622	11	2007
WANG X	9	13	1	188	19	2017
CHEN Y	7	11	0.38888889	226	11	2008
LI J	7	10	0.5	201	10	2012
WEI Y	7	7	0.35	490	7	2006
ANWAR S	6	9	0.5	173	9	2014
CHEN X	6	10	0.66666667	179	10	2017
CHEN Z	6	9	0.3	227	9	2006
SUN S	6	6	0.5	154	6	2014
WANG H	6	8	0.35294118	130	8	2009
WANG J	6	11	0.46153846	121	11	2013
WANG Y	6	10	0.46153846	117	13	2013
ZHANG H	6	11	0.6	126	12	2016
ZHANG J	6	11	0.5	201	11	2014
ZHANG L	6	10	0.54545455	179	10	2015
LI H	5	8	0.71428571	138	8	2019
LI T	5	5	0.5	81	5	2016
LIN F	5	5	0.45454545	234	5	2015
LIN JY	5	7	0.14285714	80	7	1991
LIU H	5	9	0.5	85	10	2016
LIU Q	5	6	0.41666667	385	6	2014
NING L	5	5	0.38461538	180	5	2013
WANG D	5	5	0.5	201	5	2016
WANG W	5	7	0.41666667	63	8	2014
WANG Z	5	8	0.41666667	72	9	2014
WU Y	5	6	0.38461538	89	6	2013
YANG J	5	7	0.45454545	104	7	2015
ZHANG C	5	9	0.41666667	105	9	2014
ZHANG X	5	8	0.41666667	106	8	2014
ZHOU Y	5	7	0.38461538	174	7	2013
BALEZENTIS T	4	4	0.5	131	4	2018
CHEN C	4	4	0.12903226	197	4	1995
CHEN J	4	9	0.66666667	115	9	2020
DING H	4	6	0.8	46	7	2021
FAN H	4	9	0.5	142	9	2018
GAO Y	4	5	0.33333333	41	5	2014

Table A2. List of institutions with 10 or more publications related to the capital flow and economic growth of China

Affiliation	Articles
PEKING UNIV	85
RENMIN UNIV CHINA	67
CENT UNIV FINANCE AND ECON	54
UNIV INT BUSINESS AND ECON	48
NANKAI UNIV	46
FUDAN UNIV	45
XIAMEN UNIV	44
ZHEJIANG UNIV	43

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Table A2 (cont.). List of institutions with 10 or more publications related to the capital flow and economic growth of China

Affiliation	Articles
NANJING UNIV FINANCE AND ECON	39
SOUTHWESTERN UNIV FINANCE AND ECON	35
SHANGHAI UNIV FINANCE AND ECON	33
JINAN UNIV	32
HUAZHONG UNIV SCI AND TECHNOL	31
ZHONGNAN UNIV ECON AND LAW	30
NANJING UNIV	28
EAST CHINA NORMAL UNIV	27
TSINGHUA UNIV	25
CITY UNIV HONG KONG	24
GUANGDONG UNIV FOREIGN STUDIES	23
SICHUAN UNIV	23
BEIJING NORMAL UNIV	22
HONG KONG UNIV SCI AND TECHNOL	21
HUNAN UNIV	21
ZHEJIANG GONGSHANG UNIV	20
XI AN JIAO TONG UNIV	19
CHINESE UNIV HONG KONG	18
UNIV SUNSHINE COAST	18
SOOCHOW UNIV	17
UNIV NOTTINGHAM	15
ZHEJIANG UNIV FINANCE AND ECON	15
CHINA AGR UNIV	14
HONG KONG POLYTECH UNIV	14
WUHAN UNIV	14
NANCHANG UNIV	13
SHANGHAI LIXIN UNIV ACCOUNTING AND FINANCE	13
UNIV CHINESE ACAD SCI	13
UNIV LEEDS	13
LINGNAN UNIV	12
OCEAN UNIV CHINA	12
SCH MANAGEMENT	12
SHANDONG UNIV	12
XIAN JIAOTONG LIVERPOOL UNIV	12
ANHUI UNIV FINANCE AND ECON	11
LIAONING UNIV	11
SHANGHAI JIAO TONG UNIV	10
TIANJIN UNIV	10

Table A3. Country-wise distribution of articles and international collaboration patterns

Country	Articles	Articles %	SCP	MCP	MCP %
CHINA	526	82.3161189	389	137	26.0456274
USA	29	4.53834116	0	29	100
UNITED KINGDOM	24	3.75586854	0	24	100
AUSTRALIA	15	2.34741784	0	15	100
CANADA	9	1.4084507	0	9	100
GERMANY	5	0.78247261	0	5	100
JAPAN	3	0.46948357	0	3	100
MALAYSIA	3	0.46948357	0	3	100
SINGAPORE	3	0.46948357	0	3	100
SPAIN	3	0.46948357	0	3	100
CROATIA	2	0.31298905	0	2	100

Table A3 (cont.). Country-wise distribution of articles and international collaboration patterns

Country	Articles	Articles %	SCP	MCP	MCP %
ITALY	2	0.31298905	0	2	100
NETHERLANDS	2	0.31298905	0	2	100
NEW ZEALAND	2	0.31298905	0	2	100
PAKISTAN	2	0.31298905	0	2	100
BELGIUM	1	0.15649452	0	1	100
GHANA	1	0.15649452	0	1	100
IRELAND	1	0.15649452	0	1	100
KOREA	1	0.15649452	0	1	100
LATVIA	1	0.15649452	0	1	100
LITHUANIA	1	0.15649452	0	1	100
PHILIPPINES	1	0.15649452	0	1	100

Table A4. Annual citation metrics related to the capital flow and economic growth of China

Year	MeanTCperArt	N	MeanTCperYear	N
1990	22	1	0.61	36
1991	8	1	0.23	35
1995	142	1	4.58	31
2000	11	1	0.42	26
2001	34.67	3	1.39	25
2002	187	1	7.79	24
2003	84	1	3.65	23
2004	185.67	3	8.44	22
2005	19.33	3	0.92	21
2006	123.33	3	6.17	20
2007	84.6	5	4.45	19
2008	4.33	3	0.24	18
2009	86.38	8	5.08	17
2010	37	7	2.31	16
2011	31.12	8	2.07	15
2012	39	11	2.79	14
2013	22.9	21	1.76	13
2014	15.1	29	1.26	12
2015	32.64	14	2.97	11
2016	61.86	28	6.19	10
2017	36	28	4	9
2018	26.42	33	3.3	8
2019	25.82	40	3.69	7
2020	19.2	50	3.2	6
2021	21.27	41	4.25	5
2022	15.15	54	3.79	4
2023	9.68	65	3.23	3
2024	4.5	106	2.25	2
2025	1.43	70	1.43	1

Note: MeanTCPerArt: Mean Total Citations per Article (the average total number of citations articles from that year have received); N: Number of articles published in that year that is in your dataset. MeanTCPerYear: Mean Total Citations per Year (a normalized metric that shows the average annual citation rate, evening out the advantage older papers have); CitableYears: The number of years articles from that publication year have been available to be cited (e.g., a paper from 1990 had 36 years until your study's cutoff date).

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Table A5. R script used in Biblioshiny application

The software was initialized by running the following R script
Install and load the bibliometrix package
if (!require("bibliometrix")) install.packages("bibliometrix")
library(bibliometrix)
Launch the Biblioshiny application
biblioshiny()

APPENDIX B

Table B1. List of journals used in Web of Science query

List of Journals
TECHNOLOGICAL AND ECONOMIC DEVELOPMENT OF ECONOMY OR
JOURNAL OF INTERNATIONAL TRADE ECONOMIC DEVELOPMENT OR
ECONOMIC DEVELOPMENT AND CULTURAL CHANGE OR
ENERGY ECONOMICS OR
ENERGY POLICY OR
WORLD ECONOMY OR
WORLD DEVELOPMENT OR
FINANCIAL AND CREDIT ACTIVITY PROBLEMS OF THEORY AND PRACTICE OR
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE OR
ECONOMIC MODELLING OR
INTERNATIONAL BUSINESS REVIEW OR
REGIONAL STUDIES OR
EMERGING MARKETS FINANCE AND TRADE OR
INTERNATIONAL REVIEW OF ECONOMICS FINANCE OR
JOURNAL OF BUSINESS RESEARCH OR
CHINA ECONOMIC REVIEW OR
STRUCTURAL CHANGE AND ECONOMIC DYNAMICS OR
ECONOMIC ANALYSIS AND POLICY OR
EMPIRICAL ECONOMICS OR
JOURNAL OF INTERNATIONAL BUSINESS STUDIES OR
JOURNAL OF DEVELOPMENT ECONOMICS OR
JOURNAL OF WORLD BUSINESS OR
LOCAL ECONOMY OR
ECOLOGICAL ECONOMICS OR
FINANCE RESEARCH LETTERS OR
THUNDERBIRD INTERNATIONAL BUSINESS REVIEW OR
RESEARCH IN INTERNATIONAL BUSINESS AND FINANCE OR
SMALL BUSINESS ECONOMICS OR
JOURNAL OF ECONOMIC BEHAVIOR ORGANIZATION OR
JOURNAL OF POLICY MODELING OR
JOURNAL OF COMPARATIVE ECONOMICS OR
SOCIO ECONOMIC PLANNING SCIENCES OR
JOURNAL OF INTERNATIONAL MONEY AND FINANCE OR
RESEARCH POLICY OR
REVIEW OF WORLD ECONOMICS OR
JOURNAL OF INTERNATIONAL MANAGEMENT OR
JOURNAL OF TECHNOLOGY TRANSFER OR
MANAGEMENT INTERNATIONAL REVIEW OR
JOURNAL OF INTERNATIONAL ECONOMICS OR
JOURNAL OF DEVELOPMENT STUDIES OR

Table B1 (cont.). List of journals used in Web of Science query

List of Journals
GLOBAL STRATEGY JOURNAL OR
MULTINATIONAL BUSINESS REVIEW OR
ANNALS OF REGIONAL SCIENCE OR
TRANSPORT POLICY OR
REVIEW OF INTERNATIONAL POLITICAL ECONOMY OR
INTERNATIONAL JOURNAL OF FORECASTING OR
PAPERS IN REGIONAL SCIENCE OR
INTERNATIONAL REVIEW OF FINANCIAL ANALYSIS OR
JOURNAL OF TRANSPORT GEOGRAPHY OR
EQUILIBRIUM QUARTERLY JOURNAL OF ECONOMICS AND ECONOMIC POLICY OR
EUROPEAN ECONOMIC REVIEW OR
EUROPEAN JOURNAL OF POLITICAL ECONOMY OR
TOURISM ECONOMICS OR
NORTH AMERICAN JOURNAL OF ECONOMICS AND FINANCE OR
JOURNAL OF ECONOMIC GEOGRAPHY OR
BUSINESS STRATEGY AND THE ENVIRONMENT OR
ECONOMIC HISTORY REVIEW OR
ENTREPRENEURIAL BUSINESS AND ECONOMICS REVIEW OR
JOURNAL OF INSTITUTIONAL ECONOMICS OR
TRANSPORTATION RESEARCH PART A POLICY AND PRACTICE OR
CAMBRIDGE JOURNAL OF REGIONS ECONOMY AND SOCIETY OR
FOREST POLICY AND ECONOMICS OR
WORLD BANK ECONOMIC REVIEW OR
JOURNAL OF INTERNATIONAL BUSINESS POLICY OR
INTERNATIONAL ENTREPRENEURSHIP AND MANAGEMENT JOURNAL OR
BUSINESS HISTORY OR
JOURNAL OF COMPETITIVENESS OR
MANAGEMENT DECISION OR
JOURNAL OF REGIONAL SCIENCE OR
ASIA PACIFIC JOURNAL OF MANAGEMENT OR
JOURNAL OF ECONOMIC SURVEYS OR
ECONOMIC INQUIRY OR
REGIONAL SCIENCE AND URBAN ECONOMICS OR
OECONOMIA COPERNICANA OR
PACIFIC BASIN FINANCE JOURNAL OR
AMERICAN ECONOMIC REVIEW OR
ENVIRONMENT AND DEVELOPMENT ECONOMICS OR
NEW POLITICAL ECONOMY OR
ECONOMIC GEOGRAPHY OR
JOURNAL OF ECONOMIC GROWTH OR
BORSA ISTANBUL REVIEW OR
EMERGING MARKETS REVIEW OR
INDUSTRIAL AND CORPORATE CHANGE OR
MANAGEMENT AND ORGANIZATION REVIEW OR
PUBLIC CHOICE OR
ASIAN ECONOMIC PAPERS OR
CHINA ECONOMIC JOURNAL OR
JOURNAL OF SMALL BUSINESS AND ENTERPRISE DEVELOPMENT OR
TECHNOVATION OR
TOURISM MANAGEMENT

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