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A Systematic and Bibliometric Literature Review of Global Value Chain

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Abstract
Numerous exploratory, conceptual and pragmatic investigations into the Global Value Chain (GVC) are available in development theories, business management and international economics literature. This problem is that insufficient effort is made to show an extensive 'science map' of this area. Thus, the purpose of the research is to (1) determine the relevance, effectiveness, and significance of the topic, (2) describe the research methodology, and (3) set forth the conceptual structure.

Keywords: International Trade, Global Value Chain, Supply Chain Management, Bibliometric analysis, Science mapping.

1. Introduction

In the academic community, various pioneering works (Prahalad and Ramaswamy 2000), the theory of service economics (Vargo and Lusch's 2004), and numerous other studies have produced extensive and diversified research (Ranjan and Read, 2016), which transcends traditional perspectives of value chains and addition. A traditional perception of a manufacturer based on products and services could be interpreted as value addition (Ballantyne, 2004). Bringing goods and services to customers is achieved by integrating the expertise and capabilities of the partners. This is possible in a service-oriented atmosphere (Vargo et al., 2008). There is ample evidence that competition and cooperation environments enable value generation. Ngongoni and Grobbelaar (2017) studied the role of multiple stakeholders in activating value creation in this entrepreneurship system (Bansal, Rohit. bakshi, 2023; Maurya, PK Rohit Bansal, Yasmeen Ansari, 2023; Prince, Kumar Maurya. Rohit, Bansal. Yasmeen, Ansari. Anand, 2023).
Furthermore, Crick et al. (2020) investigated how the competitive environment impacts the enhancement of wine's value creation activities. For this reason, the breakup of conventional buyer-seller relationships may be highly desirable in service-dominant economies. By connecting the clusters of firms to a larger system of related goods and suppliers, knowledgeable workers, and industry networks, the cluster model helps firms to concentrate on their expertise areas (Giuliani et al., 2005), ensuring the efficient use of technology, workers, and industry connections and competitiveness. For a region to thrive

economically, it needs adequate infrastructure connectivity and specialized networks to compete more effectively and at a comparative advantage (Porter, 1990, 2000). Currently, manufacturing goods and services is viewed as a process that is only viable when the required materials are readily available. Efficiency and reliability are also major considerations. It considers the activities outside of the network and the role of partnering with appropriate and

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independent parties (Gereffi, 1999; Giuliani et al., 2005). Researchers and pioneers in various fields are becoming increasingly interested in the clustering of industries. In recent years, different studies on these strategies have

expanded rapidly as they are widely regarded as effective ways to improve the performance of multinational corporations (Giuliani et al., 2005) (Bansal et al., 2021; Vikas & Bansal, 2019; Zahera & Bansal, 2018).

Analyzing published literature in fields provides a domain based on bibliographic studies. The recent literature on the bibliometric study in the context of world trade is discussed in a realm such as Global Value Chain (Pietrobelli C., Rabellotti R 2014, Dedrick J., Kraemer K.L., Linden G. 2011), Governance in Global Value Chain (Ponte S. et al. 2014, Bush S.R. et al. 2015), Labour and Poverty in the Global Value Chain (Riisgaard L., Hammer N.2011, Selwyn B.2019), Environment and Sustainability (Wang Z., Li M., Meng B., Peters G.P. 2018, Oosterveer P., Bush S.R., Bailey M., Mol A.P.J. 2015), Artificial Intelligence and Technology (Strange R., Zucchella A. 2017, Lund-Thomsen P., Lindgreen A. 2014, Hobday M., Rush H.2007), COVID 19 and Global Value Chain (Juergensen J., Guimón J., Narula R.2020, Oldekop J.A., Horner R., et. al. 2020), and Women's participation in the global value chain (Said-Allsopp M., Tallontire A. 2015). Throughout history, the area of the global value chain has developed into a multidisciplinary area. An overview of the development of research concerning relevant literature is presented in this paper. This study analysed multiple patterns to dig deep into the sporadic studies using bibliometric analysis.

2. Research Questions

i. What is theLiteraturee onthe evolutionary history of Global value Chain

ii. What are the most important, productive and prestigious journals and who are the productive and prestigious

authors in the global value chain domai?

iii. What documents contributed to the intellectual framework of the study on global value chains

iv. What is the rational cognition of the research fraternity?

v. Wha is cross-sector nexus?

vi. How has this concept and its management developed and what are the main challenges and ideas talked about?

These research questions are interpreted into the following *objectives* for this study.

Objective 1: To analyze and identify trends in the dissemination of intellectual contributions in the context of this topic.

Objective 2: To comprehensively describe and articulate the scientific significance of this topic.

Objective 3: To gain insights and develop a comprehensive understanding of this topic by exploring its conceptual structure.

Objective 4: To identify and emphasize the most relevant clusters of information or concepts associated with this topic.

3. Theoretical Model

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Since the globalization of production and trade has become mainstream, global production and trade are being restructured by focusing on comparative advantage and expansion (Gereffi 2011). Global trade is travelling into a leading divergence position (Fung, 2011), whichat has substantial inference for economic and social welfare. Inputs, transformation processes or intermediate inputs collectively produce output. Intermediate factors need to be produced by themselves and involved further in producing intermediate inputs. This process will continue till all

intermediate factors are measured (Leontief 1936). Thus, complex and dynamic global economic activities are fragmented, highlighting the importance of global consumers and producers in correlating inter-firm and intra-firm networks in global production and distribution (Gereffi, 1994).

Global trade through intermediate factors is flourishing faster than the trade in final goods. Intermediate factors or goods are widely used in different industries and countries, value chains are expanding, and every exported final product uses imported inputs (Rashmi, 2013). The value chain refers to the sequential stages involved in the flow of services and inputs throughout the product design and refinement process, ultimately leading to the delivery of the product to the customer(Webber and Labaste, 2009). Hence, the value chain describes how a product is delivered. Typically, product consumption occurs after various stages, such as processing, blending with other products, transportation, packaging, and marketing, which collectively transform the product before it reaches the end consumer. Along this value chain, value is consistently added by manufacturers, suppliers, buyers, distributors, and purchasers (UNIDO 2009, Kapilnsky & Marris, 2000).

Efficient and effective management of value chain activities ascertains the competitiveness level of the firm in domestic and international trade (Mitchell et al. 2009). The firm's activities are differentiated as initial activities because these activities are attached directly to the production process, and ancillary activities add value to measure inter-firm activities. The public and private sectors use the value chain structure to prepare industrial policy and development.

Gains from trade are taking into account the value-addition by virtual trade (Porter 1985) and a competitive advantage is also studied based on related activities and tasks (Gereffi 1999). Interlinked producers and buyers are involved in global trade through different activities through *global value addition* because goods transfer the boundaries and move among their different associates in the chain. The value chain concept helps to identify areas where countries can gain a competitive advantage in the global economy by specializing in specific sectors. Like, a country might specialize in producing parts for a large product, while another specilaize in assembling the finished goods. By understanding the global economy, policy-makers can determine which sector to focus on to gain a competitive advantage. Since 1970, development strategies in developing countries have changed significantly. They have shifted from import substitution policies to export-based policies that have also changed the investment climate and trade. Goods and services are produced and assembled along the supply chain at different stages within and across the countries.

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Reduced trade barriers facilitated by the WTO and robust government policies provide a solid foundation for success in international trade, particularly in a landscape where global production processes are intricately interconnected. Foreign Direct Investments (FDIs) and the presence of Multinational Corporations (MNCs) prominently contribute to the interlinked activities fostering global trade growth (Yamin & Sinkovics 2009, Gifford et al. 2010, Meyer 2004). Therefore, The global value chain can adversely affect the world economy through its adverse effects on market dynamics, competitiveness, macroeconomic policies, and the economic inter-dependencies between nations (Amador and Cabral 2014). In contrast, a global value chain is one in which each participant goes about executing a particular undertaking, and distinct participants contribute to different parts of the manufacturing or service chain, providing them with distinct advantages, and this helps companies analyze their competitiveness based on the global value chain (UN 2010). Countries have the flexibility to join the value chain at different levels and can realize benefits by enhancing their production processes in proportion to their level of involvement.

Throughout the transformation of physical goods, firms and nations' management of supply chains enhances their competitiveness. Additionally, increased access to finance strengthens their financial solvency, while a continuous flow of knowledge drives innovation in new directions. Firms in developed countries outsource the production and service activities in domestic and global markets where they are not specialized. Developing countries' firms extensively provide these services (Mishra et al., 2023; Verma & Bansal, 2021) (Gereffi and Humphrey 2005).

Next, we can understand the chain's links, including the economic activities associated with them, by mapping the value chain (Grote and Winter 2009). *Governance* represents a dynamic component in which the leading members possess authority and capability throughout the chain while the other members follow the rules and regulations (Mark 2019, Gereffi 1994) . It controls raw materials, inputs, and financial and human resources to make decisions related to the central problems of the economy (Humphrey and Schmitz 2009).

Although globalization has given a high degree of *interlinkages* and participation among countries, the gain from trade and social welfare is not equally experienced by all inputs and countries when exchanging in the production process to perform a set of tasks (OECD 2015, Harrison,2011). The global value chain enhances countries' benefits when their national firms perform better, draw more foreign investment, and possess greater technological expertise (Tanglioni and Winkler 2016). These spillover effects in economic development are analyzed through forward and backward networks in the global value chain (Bansal et al., 2021; Verma & Bansal, 2023) (Schmitz and Nadavi 1999). Forward network or downstream participation means the relationship between the supplying firm or buying firm where the final good of the supplier is used as input. Similarly, when linkages are between the exporting and importing countries, the country exports inputs to produce more goods for export (Javorsek and Camacho 2015). Backward linkages or upstream participation show the relationship where firms of importing countries import intermediate inputs to produce more export goods (Tefera 2010). Participants' benefits improve with the intensity of their participation. However, the social benefits are not positive for many emerging countries.

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From innovation to the final consumption, countries participate at different stages based on their comparative advantage by adding values (Ye, Meng and Wi 2015). *Intangible activities* like research and development, design, and brand building at the initial stage to marketing and distribution of the good are linked with developed countries and offshore the *tangible producing activities* to less advanced technology developing countries. Global value chain provides opportunity by diversifying their exports for the developing countries in economic terms only but social benefits are not equal for them.

Over the past decade, there has been a notable transformation in the challenges faced within the global value chain. Exporters from developing countries have shifted their approach, adapting to global demand rather than relying solely on their exports. These exporters now specialize in producing small components for final consumption, actively managing the fragmented supply chain. In the historical context, a substantial body of research, encompassing conceptual, mathematical, and empirical studies, has been conducted to explore these evolving dynamics. However, it is dispersed across disciplines like development theories and international business. The importance of the international value chain helps shape the economic development of many developing countries. However, some studies used a systematic approach to compile the literature, but they were context-specific, thematic, or focused on theoretical frameworks.

4. Methodology of research

Research for this study was conducted by creating a database then using that database for research. A repository is determined after reviewing and determining relevant statistical information. Several distinct keyphrases are then merged to form a comprehensive analysis. Analytical software builds a data set by considering and discarding
pertinent standard deviations. As a first step, a descriptive analysis of the data is performed based on the documents, sources, and authors. Further data analysis uses principal component analysis and multiple correspondence analysis. An optimal data visualization map is then built, enabling conceptual, intellectual, and social comprehension of the data. Journal articles must be presented logically in the index to perform Bibliometric analysis. Bibliometrix software integrates the scope of publications and genres of journals R studio offers into Bibliometrix. Title, abstract, and keywords were used to retrieve the SCOPUS database. SCOPUS is considered the premier index of abstracts and citations of the scientific literature. Data mining is facilitated by using SCOPUS as opposed to other platforms, as it includes only high-quality journals from different disciplines, excluding magazines and other non-scholarly publications. Journal Citation Reports are widely regarded as markers of impact among academics. All articles were validated and checked for accuracy before they were imported from SCOPUS in simple file form. A total of 84 records were evaluated according to the guidelines. Many scientific papers employ similar terminology, including terms like "Value Chain," "Product Chain," and "Linking Network."

We embarked on an extensive review of publications spanning from 2005 to 2021, with the primary objective of identifying trends in the global value chain across the domains, like international business, management, economics, and corporate social responsibility. This methodological approach was meticulously employed to ensure no groundbreaking work within our database was overlooked. Our database was systematically categorized into various topics, encompassing diverse disciplines such as

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economics, commerce, and management. Thus far, we have amassed a comprehensive dataset consisting of 510 records.

To further refine our dataset, we prudently excluded proceedings papers. This curation process yielded a final selection of 510 documents, comprising various content types including book chapters, articles, open-access resources, and reviews. Prior to this, we had diligently assessed the English proficiency of these shortlisted documents. Leveraging the capabilities of Biblioshiny, we processed the topics, authors, abstracts, and keywords in plain text format. Subsequent to removing duplicate documents and ensuring uniform formatting, we seamlessly integrated these 510 documents into the Bibliometric framework for subsequent in-depth analysis. As part of our comprehensive mapping process, library and information science experts have applied a bibliometric approach that has previously been employed for analyzing scientific reviews. This approach has proven to enhance efficiency and productivity within the library and information science domain. Utilizing the Bibliometrix R-package enables us to analyze and visually represent data effectively. Researchers incorporate various bibliometric factors into their studies, including metrics like the total number of publications, annual citations, citation statistics, co-citation networks, author co-citation networks, and keyword analysis.This method enables science mapping analysis, efficiently conducted using open-source Bibliometrix software.

Analysis of Data A descriptive study examines bibliometric data by pinpointing essential elements such as documents (a), authors (b), and sources/journals (c). On the other hand, (2) scientific mapping enables a comprehensive understanding of the knowledge landscape through a combination of data visualizations, thematic maps, three-field plots, network analysis, and knowledge network determination.Our systematic keyword search in the SCOPUS repository resulted in the discovery of 510 documents aligning with the bibliometric criteria. iThey were cited in 511 sources, showing the importance of research in recent years.

Data Overview:

- Key Data Highlights Time Frame: 2005–2021 Source: Scopus
  Total Articles: 1,138, Average Years Since Publication: (Not specified)
- Document Types; Sources (Books, Journals): 511
- Document Content; Keywords Plus: 465, Author’s Keywords: 1,326
- Authors Information; Total Authors: 832; Appearances of Authors: 2,912
  Multi-authored Work: 2,028

Total Annual Publications

Journal of Regional Studies published the initial study on these topics in 2002 (Humphrey and Schmitz, 2002). Annual scientific production during the period 2005-21 is having an increased trend. There was a sharp increase in the year 2020 when supply chain and hence, global trade was disturbed due to COVID-19 and lock-downs, which started from China. Much research work was cited after 2013 when the importance of international trade and the global value chain was taking place and many new studies were conducted. Most of the writing materials are six years old and touches the maximum number in 2020 as shown in

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figure 1. It implies a great opportunity and scope of research in this field. Growth in research is experiencing, as a forerunner, rampant growth, integrating its knowledge and then decreasing in the number of studies.

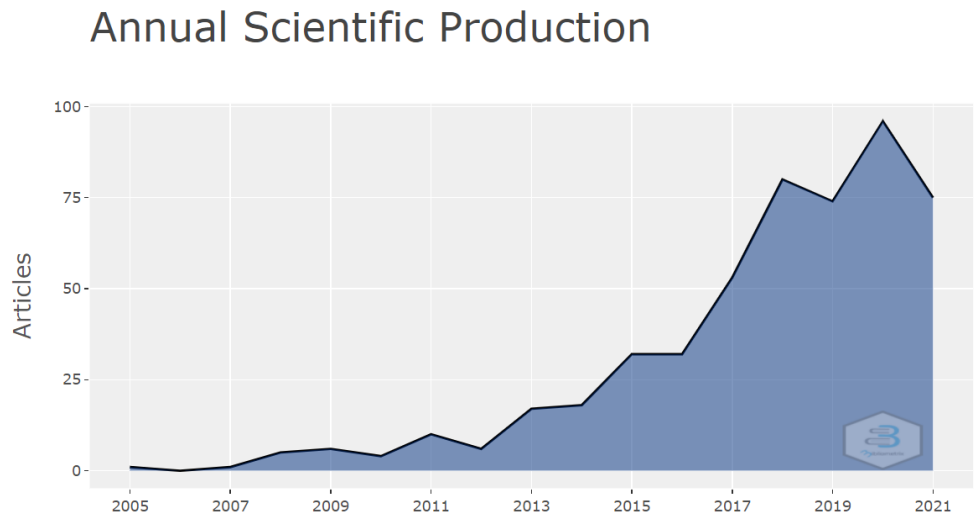

Figure 1.

Development tendencies of this concept are recognized eventually and most of the works are concerned with the analysis of merging of countries and fragmentation of value creation and supply chain, however many other factors also become part of the study over a period of time.

(a) Change in the governance structures in coordination with global value chains, and global and intellectual monopoly capitalism after the financial crisis (Greffi 2014)
(b) Aids in enhancing information access, knowledge, and technology for developing nations (Pietrobelli C., Rabellotti R. 2011).
(c) Change in the financial value with the innovation in the global supply chains which further changes the role for industry evolution, network linking and the bargaining power (Kraemer K.L., Dedrick J., Linden G.2009)
(d) Implications of block-chain in supply chain management (Treiblmaier H.2018) and assessing the potential of emerging technologies in the areas of IoT, big data and statistics, robotics, and manufacturing additives, to streamline the workflow of the global value chain (Strange R., Zucchella A.2017)
(e) Relationship between pollution, environment and international trade (Zhang Z., Zhu K. et. al 2017)
(f) Advanced and more rich in knowledge countries do not have the solution of all problems (Lee J.M., Liu Y., Lee C. 2020) and it is resilience, strategic agility, and entrepreneurship to fight against COVID19 (Oldekop J.A. et al 2020). Methodologies adopted by cited work conceptualize and re-conceptualize the work of global value chain, empirical analysis and mathematical approach input-output analysis and statistical-panel data analysis to study the concerned field.

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Average Citation: Co-citation analysis is identified here through the citation of different journals and from the other authors. It assists in appreciating a specific research trend. Available material was investigated in the above mentioned year-wise phase, and the global value chain is highly related with governance, supply chain management, innovation, technology and sustainable development.

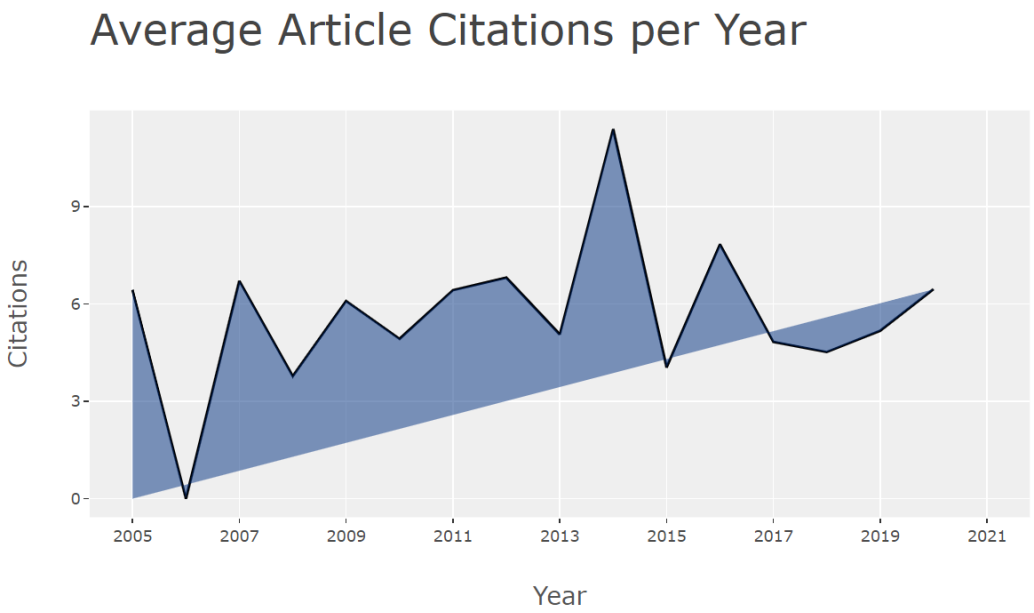

Figure 2.

Journals The most pertinent sources, as depicted in Figure 3, for understanding the global value chain include Review of International Political Economy, World Development, and World Economy. These sources hold significant importance in the realms of international trade and regional development, particularly concerning emerging economies. Apart from domain-specific journals related to Business and Management, Economics Developmental Theory and Corporate Social Responsibility, interdisciplinary research in Journal of Cleaner Production, Journal of Technological, Innovation, Review of International Political Economy, and Development and

Global Policy are also the most cited journals. Research area is wrapped with a large number of journals which implicitly diversity of research ideas and multifaceted world of research disciplines (Low and Siegel, 2019).

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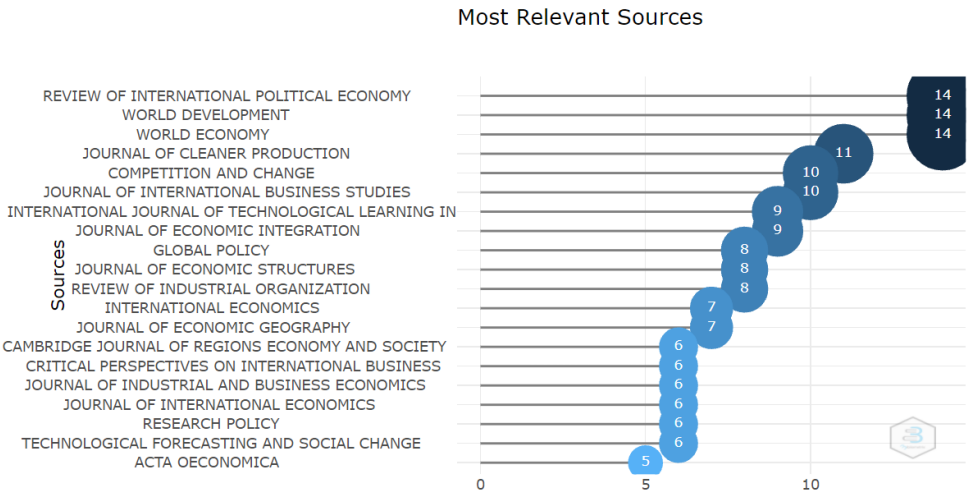
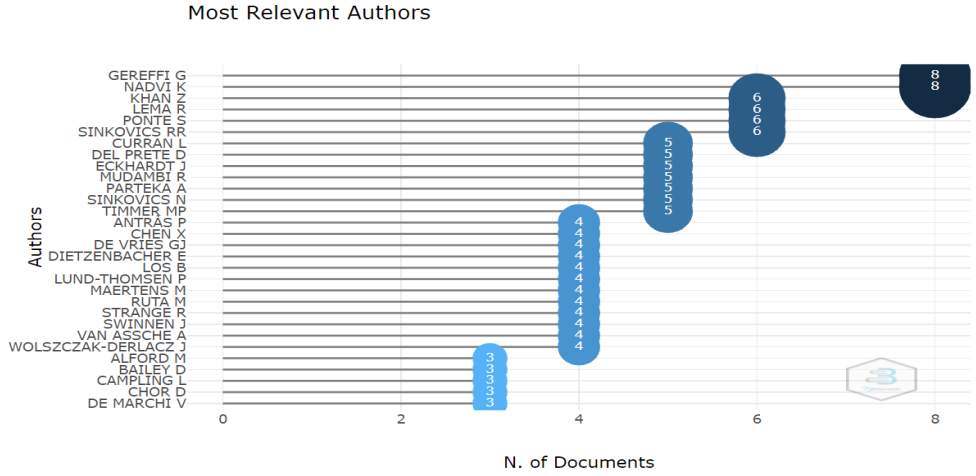


Figure 3.

Authors While the integration of companies from emerging markets into global value chains is regarded as a catalyst for business development, it has given rise to numerous challenges. Addressing these issues necessitates the involvement of local entities, multinational corporations, external agencies, or a combination thereof. Multiple factors collectively play a significant role in shaping appropriate policies for advancement, according to the research of Gereffi G. Nadavi, Khan Z, Lema R, Pointe S and Sinkovics RR. Various publications are used to accomplish this, primarily through case studies and literature reviews. Gereffi G. Nadavi, Khan Z, Lema R, Pointe S and Sinkovics RR are the most potent authors with the most extreme works in this area. Gereffi G. Nadavi and Khan Z, each has 8 articles published on this topic as shown figure 4. Gereffi G. Nadavi, Khan Z, Lema R, Pointe S and Sinkovics RR are also authors with h-index impactful authors. Their output is original, unique and very significant for future research in this area. Keywords are the primary components of a particular area of study, and render an aspect of the



artifact of knowledge and research trends. In bibliometric research, citation of authors helps to understand the

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rational and conceptual network of scholars in a particular area.

Figure 4.

Intellectual Structure and Thematic Organization: Identifying cross-references in co-citations is one way of determining how a book or article is organized intellectually and thematically. When articles are cited simultaneously, there is a thematic convergence and resemblance. In this study, different citation types are utilized for analysis, each suited to its specific analytical method (Small 1973, Shafique 2013). Through co-citations, most commonly referenced papers on global value chains can be analyzed.

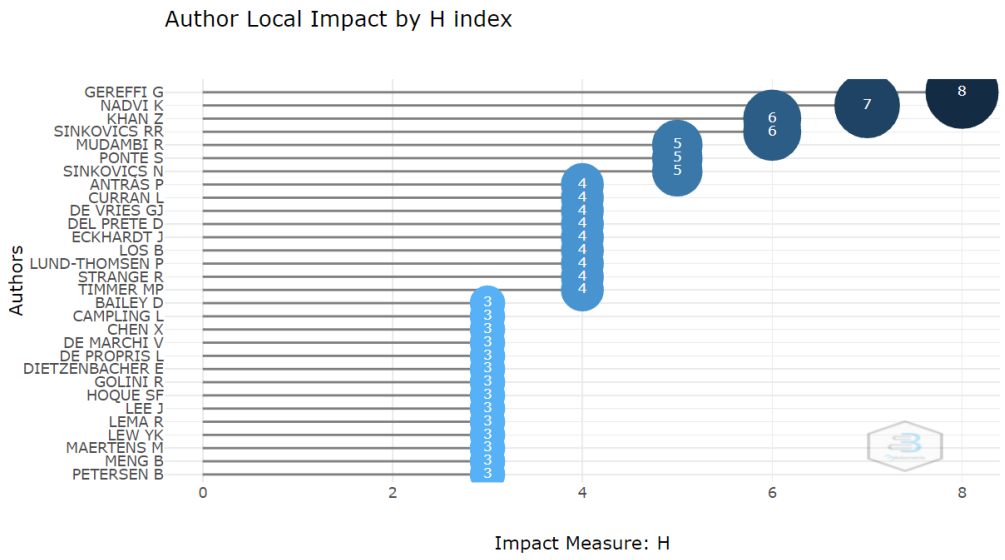

Figure 5

Authorship Citation Based on the volume of citations, the most influential documents are those with the greatest impact. Consequently, citation analysis enables researchers to gauge the significance of specific documents within a given subject area. Notably, the top 30 authors have received more than 100 citations each. The works of Gereffi, Timer, and Pietrobelli have each garnered over 300 citations, underscoring their substantial contributions to the global value chain field. Gereffi, in particular, stands out with 376 citations, while Erumban A.A., Stehrer R., De Vries G.J., Los B., and Timmer M.P., collectively received 324 citations in 2014, and Pietrobelli C. and Rabellotti R. received 304 citations in their work in 2011, as illustrated in Figure 5. Authors of highly cited articles are used as main references in writing on GVC, innovation, technology, sustainability, and governance, and their numerous citations and their inter-connectivity signifies their prominent status in this field and their publications and research converge to direct future research agenda. Scholarly cooperation can benefit researchers, and insights from diverse perspectives can lead to breakthroughs. As a result of the clustering, the researchers' work becomes more effective

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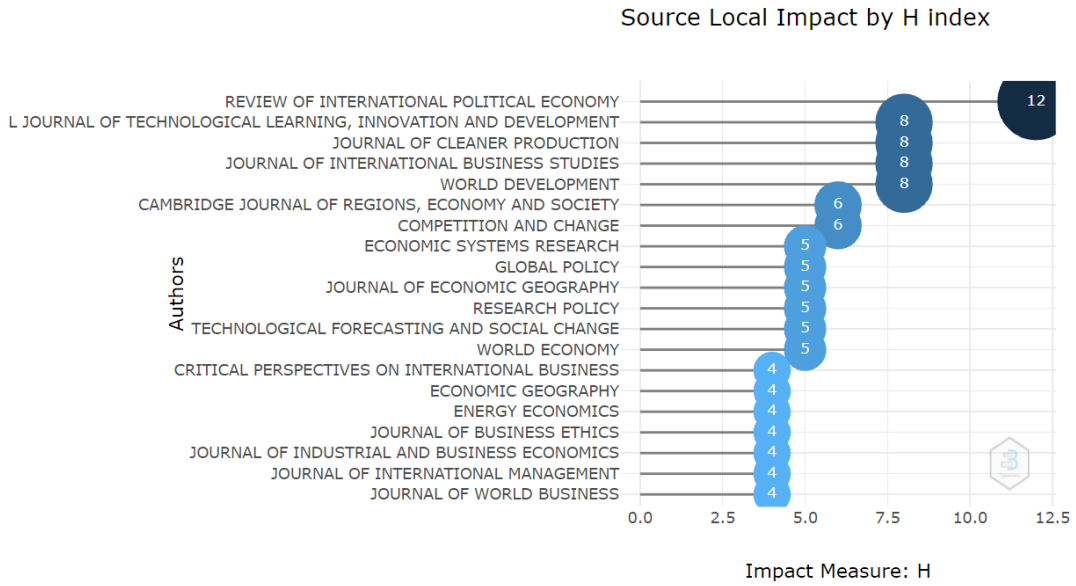
Journal citation is the most logical and certain sign of many studies and it symbolizes favorite estimation to set up a topic and theme affinity. Detailed inspection of the journals brings out the fact of having multiple numbers of published study material with multiple number of citations, however, *H-index* is the best indicator to determine the relevance or the impact of a publication (figure 6). Strong correlation between the documents is taken as reference

by apprehending mainly the old documents compared to current ones which means that contemporary documents need time to affect the literature. Review of International Political Economy has the highest impact factor (12),

followed by Journal of Technological Learning, innovation and Development, Journal of Cleaner Production, Journal of International Business Studies and World Development with Impact factor 8 of



each.

Figure 6

Locally estimated scatter plot smoothing is used to study the source growth of publications over the period. *Journal of International of Business Studies* is having maximum number of publication, however, *World Economy* and *World Development* is also showing a surge in publication after 2019-20 (figure 7). While the number of publications in other Journals is also increasing and showing the importance of the topic in the status-quo.

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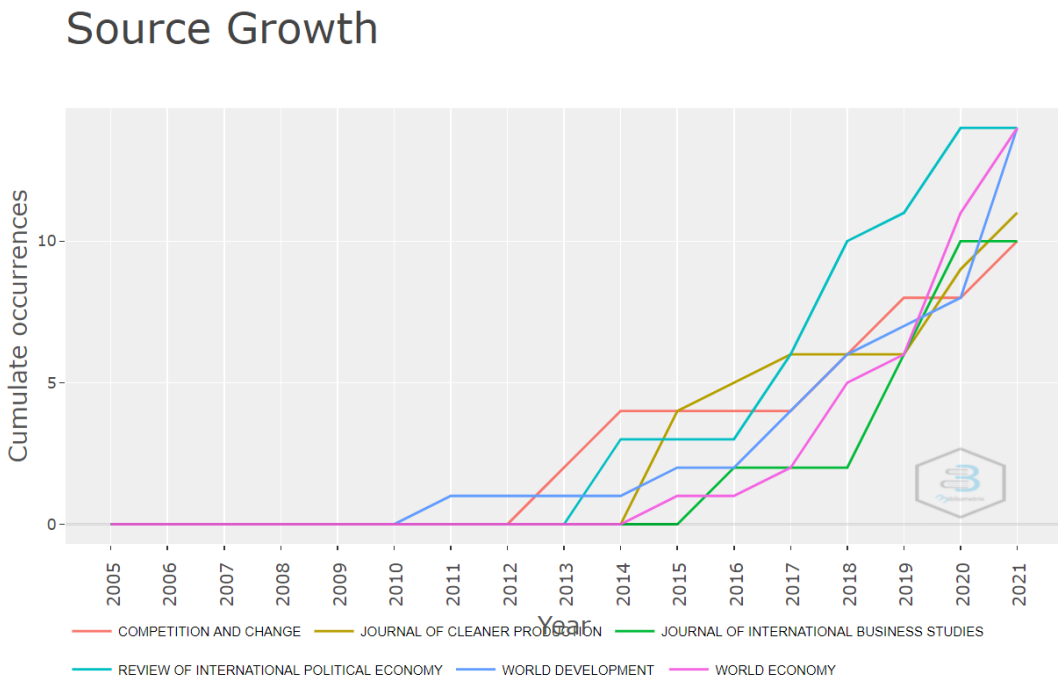

Figure 7

Document Co-citation: When two documents are commonly referenced in research papers and these cited documents share a close connection, this relationship can be visually demonstrated through graphical representation. Notably,

there was a publication in the Journal of Regional Studies that received the highest number of citations 18 years ago. Humphrey and Schmitz's (2002) paper acted as a catalyst for research in this field and holds the highest influence both in absolute and relative terms. Consequently, this study is regarded as a cornerstone in a significant research stream focused on enhancing regional economies through integration within global value chains and environments. Furthermore, Journals with the greatest number of citations are primarily responsible for driving this field's influence, as depicted in Figure 8. The Review of International Political Economy stands out as a highly cited journal with the highest number of citations, reaching 376, primarily due to the research study by Gereffi G. published in 2014. This is followed by Timmer MP's work in Economics Perspective (2014), Pietrobelli C's work in World Development (2011), and Industrial Corporate Change, among other esteemed sources.

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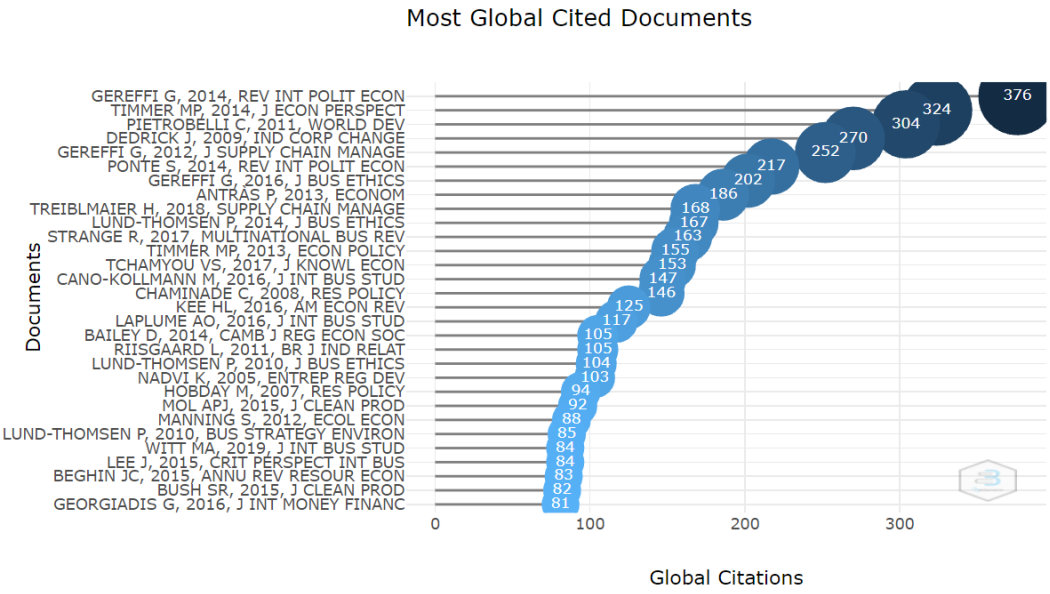

Figure 8

Researchers may also find thematic patterns on the basis of co-citation analysis, in addition to identifying the most influential publications. Using cited publications, the thematic groups are derived. In co-citation analysis, however, relatively recent or specialized publications are kept out of topic clusters because they are less frequently cited. For researchers seeking to identify important publications and knowledge bases, co-citation analysis may be useful.

Geographical Contribution indicates the share of various countries in academic research on the current topic, and advanced countries put more effort into it. Number of the publications are mostly from the China, UK and USA (figure 9). Repeated citations are acknowledged in the published articles of this topic. Among these countries, the China received the maximum citation number due to good quality work from here. China, as an Asian developing country, is contributing in academic research and shows a gradual progress in the publication on this topic. In

addition, bibliometric data also shows that the UK surpasses the Netherlands, France and Germany and a lesser number of citations are gathered from these countries.

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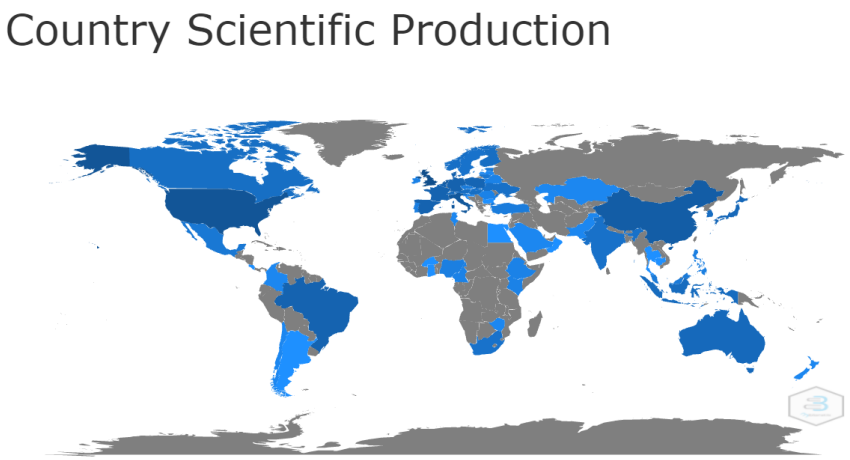
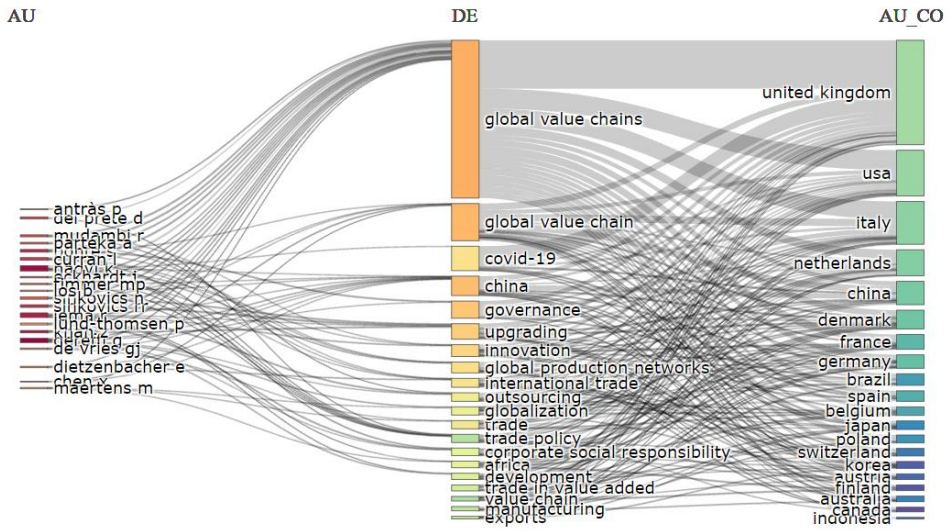


Figure 9

The utilization of Three-field Sankey plots proves invaluable for visualizing the geographical distribution of scientific contributions across three key dimensions: authors, keywords, and source locations. These plots offer a clear depiction of the relationships through the use of Sankey diagrams. In this visualization, the left segment represents authors, the middle segment illustrates keywords, and the right segment highlights selected sources for analysis. Significant keywords such as Global Value Chain, China, Governance, Upgrading, Innovation, International Trade, Global Production Network, Outsourcing, COVID-19, Globalization, Trade Flow, Trade Policy, Corporate Social Responsibility, Export, Manufacturing, and Development are thoughtfully associated with their respective sources and the creative minds behind them. It's noteworthy that the global value chain's significance in international trade, particularly influenced by manufacturing and domestic trade policies, is a prominent and recurring theme



in prestigious journals from the UK, US and the EU.

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Figure 10.

First and second clusters, it's evident that Antràs P. stands out as a distinguished author, with Del Prete D., Giovannetti G., and Marvasi E. following closely behind due to their exceptionally noteworthy contributions to the global value chain. Notably, these authors hail from the UK and the US, as illustrated in Figure 10. In the second

cluster, Covid19 and China keywords were used by StrangeR., Gereffi G., Lee J., Kee H.L., Tang H., Nadvi K., Quayson M., Bai C., Osei V. Topics in all these clusters show the different keywords related to global value chain and suggest the relevance and significant development in this area and location of the sources of most of these publication are UK, USA, Australia and China.

Word Cloud The literature prominently features the term "Global Value Chain," which appears a total of 290 times. Following this, other significant expressions like "Global Production Clusters," "Industrial Clusters," "Fragmentation of Economic Activities," and "Forward and Backward Network" are observed (as seen in Figure 11). These insights are visually presented through a word cloud, where bold words primarily indicate frequently discussed sub-topics, including export, innovation, globalization, and sustainable development. These topics are particularly associated with regions such as the developing world. The analysis is conducted using methods such as input-output analysis and regression analysis to quantify the frequency of words across various documents. Furthermore, a trade-based framework evaluates global value chain participation by considering the proportion of cross-border trade in total exports. Similarly, the global value chain participation rate, based on production, calculates the proportion of partially completed exports involving local value addition in relation to the total value added produced.

Figure 11.

Rising topics- Trade relations, governance, research, employment, and public policies are all impacted by the global value chain. Emerging trend topics play a pivotal role in shaping the direction of future research

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across various studies. Consequently, it can be inferred that globalization serves as the root cause of the global value chain or supply chain, with economic integration yielding more significant benefits to the developing world, particularly in relation to China as opposed to India and Sub-Saharan Africa.

The allure of low wages has spurred exports and attracted foreign investments due to globalization, subsequently resulting in increased wages and productivity in developing countries. China has emerged as a pivotal manufacturing hub for advanced nations. This shift has led to fragmented activities within the manufacturing, technology, and automotive sectors in China, fostering new innovations and technological advancements. A robust government initiative promoting native innovation has the potential to reinvigorate the global value chain's relevance in several high-value fields, including research and development, marketing, and sales. The World Trade Organization has played a pivotal role in shaping industrial and trade policies for participating nations. Furthermore, recent studies have centered around new research subtopics related to sustainable development and the impact of COVID-19.

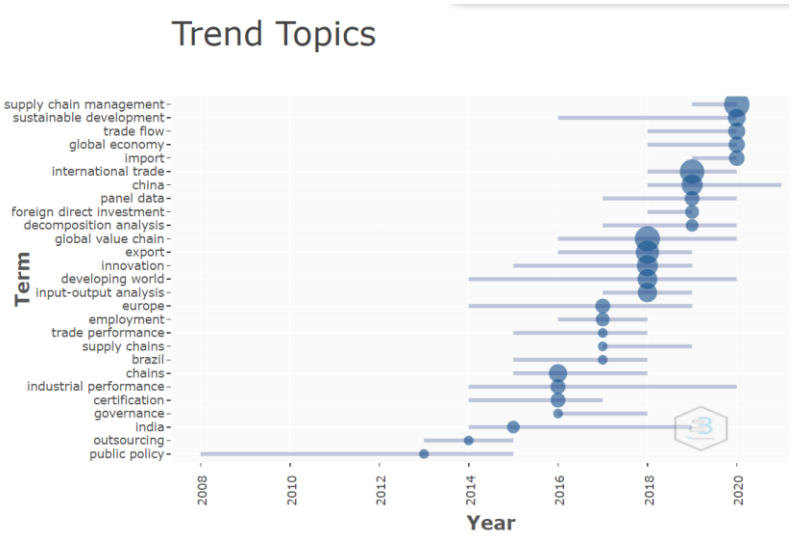

Figure 12

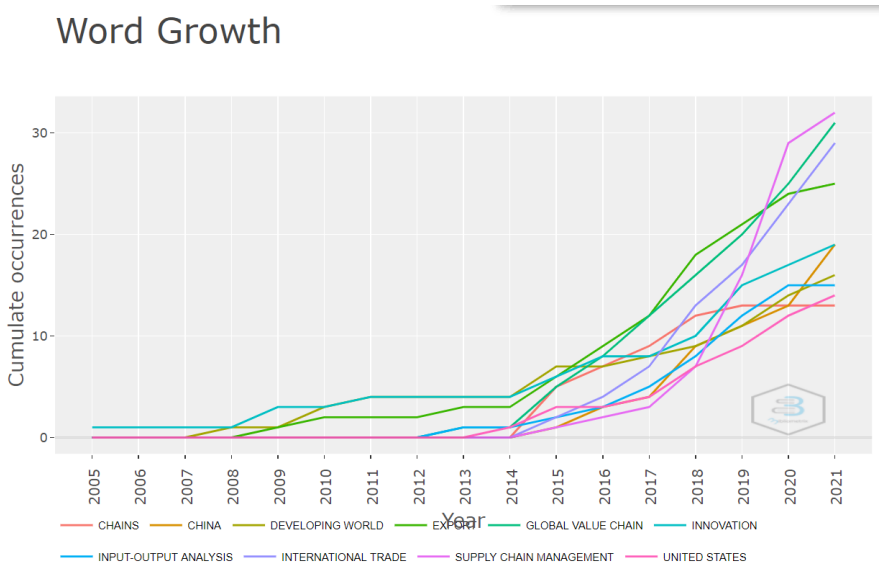

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Figure 13

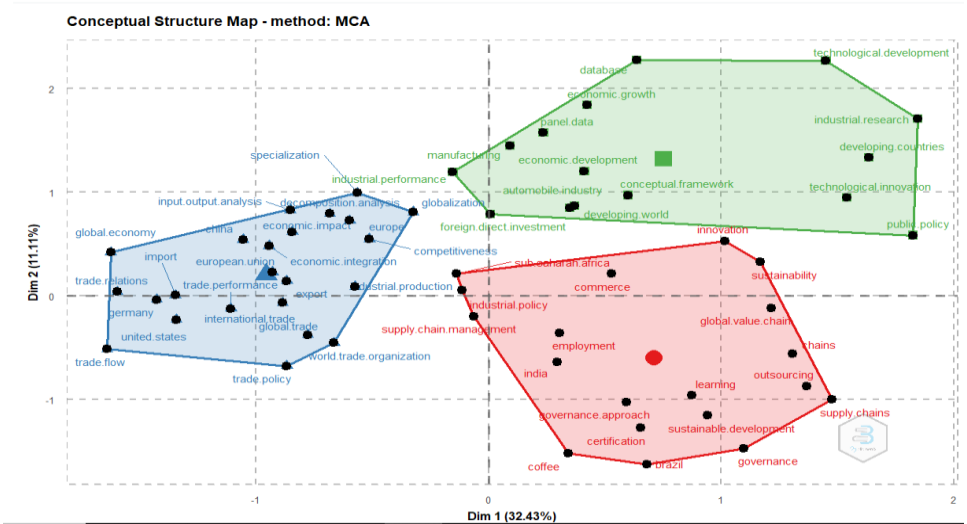
There is a range of information about the development of popular trending themes. Frequency of topics is estimated on the perpendicular side and time of publication in years on the flat side since 2018, and exceptionally fascinating trends are divulged. Global value chain, export, innovation, developing world, Europe and input-output analysis were studied. It which contemplate that input-output analysis was employed to measure how the global value chain has usurped the export and innovation in developing world mainly from Europe. The following year's most prominent topics were the global economy, imports, exports, international trade, foreign direct investment, and Panel data. Scholars studied that foreign direct investment was increasing in fragmented activities in the global economy and

China was gaining more from international trade by assembling imported goods. After Covid-19, the year 2020 witnessed altogether different topics like supply chain management, sustainable development, trade flows which was
disrupted in the global economy. Hence, supply chain management and sustainable development were the governing topics and the growth of these topics is also getting pace after the year 2020 (figure 13).

5. Scientific Mapping- Data Visualization

In recent years, the global value chain and its multifaceted aspects have piqued the interest of numerous researchers. This section will delve into the thematic evolution of this subject through Data Visualization, which entails exploring networks to gain insights based on factors such as the number of clusters, their frequencies, correlations between analyses, connection intensity, and the number of citations (Low and Siegel, 2019). Data visualization is employed to reveal these networks and relies on various approaches, including articles, authors, and keywords. Each network comprises nodes interconnected by links. Statistical maps are employed to illustrate the comprehensive relationships (Ariaa and Cuccurullo, 2017). Regarding knowledge structures within network analysis, scientific mapping can be categorized into three types: conceptual, intellectual, and social structures.

The conceptual structure employs co-occurrence analysis to elucidates the connections between topics, themes, and their evolving trends.A document's text that incorporates similar terminology or a theme that is closely related (Li et al., 2018). Multiple Correspondence Analysis is employed to get conceptual structure in the Bibliometrix package for numerical and data visualization analysis (Greenacre and Blasius,



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2006). MCA is a graphical approach that curtails the distance between linked points on a graph.

Figure 14.

In the Conceptual Structure Map, a two-dimensional plot represented in Figure 14, we observe a dispersion of keywords that share similarities. Bibliometrix analysis consistently reveals three keyword clusters, color-coded in green, red, and blue.

The blue cluster encompasses 23 keywords, including terms like 'Specialization,' 'Globalization,' 'Trade Policy,' 'Trade Flow,' 'Global Economy,' and 'Input-Output Analysis.' Input-Output analysis, as referenced in numerous studies, is employed to gain insights into vertical specialization, global value trade components, trade flow, demand analysis, and network analysis among participating countries. This approach implies an investigation into the geographical extent and development of location patterns. The red cluster represents the most widely used approaches and content related to the global value chain, including terms such as 'Innovation,' 'Sustainable Development,' 'Supply Chain,' 'Supply Chain Management,' 'Governance,' and 'Industrial Policy.' These concepts have given rise to business models impacting global sustainability, often in contrast to sustainable development goals. This cluster delves into topics such as state and civil society, corporate governance approaches, and their role in generating a sustainable electronics value chain. Governance and sustainability emerge as particularly compelling and impactful subjects in this cluster. Some articles shed light on the circumstances in which host countries and multinational enterprises attract investment, while others highlight the dynamics of cooperation between multinational enterprises and domestic enterprises for sustainability.

Additionally, keywords like 'Coffee,' 'Brazil,' and 'Sub Saharan African Countries' are included in the conceptual structure map, implying sustainability challenges faced by the coffee sector in the value chain. Sustainability and Innovation emerge as top-frequency keywords, indicating their significance as hot topics for future research in the global value chain.

The Green cluster comprises 15 keywords primarily focused on studies related to 'Technological Development,' 'Industrial Research,' 'Public Policy,' 'Foreign Direct Investment,' 'Industrial Performance,' and 'Database.' Relevant research has explored how innovation policies can enhance a country's contribution by promoting technological and industrial development. Policies related to foreign direct investment in various firms and educational institutes also play a pivotal role. Hence, various financial tools, exceptional research provisions, and expanding networks support and accelerate the global value chain. Furthermore, the green cluster investigates variables that influence the global value chain, such as GDP growth rate, participation lag, the contribution of the service sector in GDP, advanced technology usage in exports, and the level of wages.

6. Conceptual Structure

In co-word analyzing, common keywords are clustered together to identify research trends and hot topics (Li et al., 2016). 155 documents were sampled for this study, and 682 keywords were identified. Keywords

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appearing in at least eight publications have been taken into account. Those keywords appear in nodes next to each publication. Heavy keywords appear in nodes that are more prominent. The strength and number of nodes connecting together indicates how often the keywords occur together with their significance. Among the frequently used terms in this research, "global value chains" (70 mentions with a total link strength of 247), "innovation" (39 mentions with a total link strength of 177), and "clusters" (41 mentions with a total link strength of 170) stand out. Therefore, it can be concluded that the global value chain is a prominent and actively researched topic, giving rise to various research aspects.

Co-occurence Network Clustering technique of Louvain is used to draw a unit of “Keyword Plus” analysis along with 50-nodes which provide the network of keyword co-occurrence. Computer algorithms are employed to identify common words or keywords within the document's topic and references. These algorithms also provide a comprehensive grasp of the document's content, offering greater depth and breadth (Zhang et al., 2016). The data yields different clusters, represented in blue, red, orange, green, and purple. Similarities are indicated by the distance between clusters, keywords are represented by vertices, and co-occurrence is denoted by the size of the nodes. The red, blue, and green clusters exhibit strong connections with each other.

The blue cluster highlights topics related to the global value chain, including concepts like supply chain management and innovation. The red cluster focuses on fragmented activities and exports related to the global value chain in developing countries, often involving geopolitical analysis. The orange cluster showcases the countries involved in the global value chain, while the green cluster utilizes statistical and mathematical tools for analysis, exploring the spillover effect on regional development, as depicted in the purple cluster. In summary, the sample's documents primarily delve into topics concerning the economic impact on the global economy, analysis of trade relations and supply chain management.

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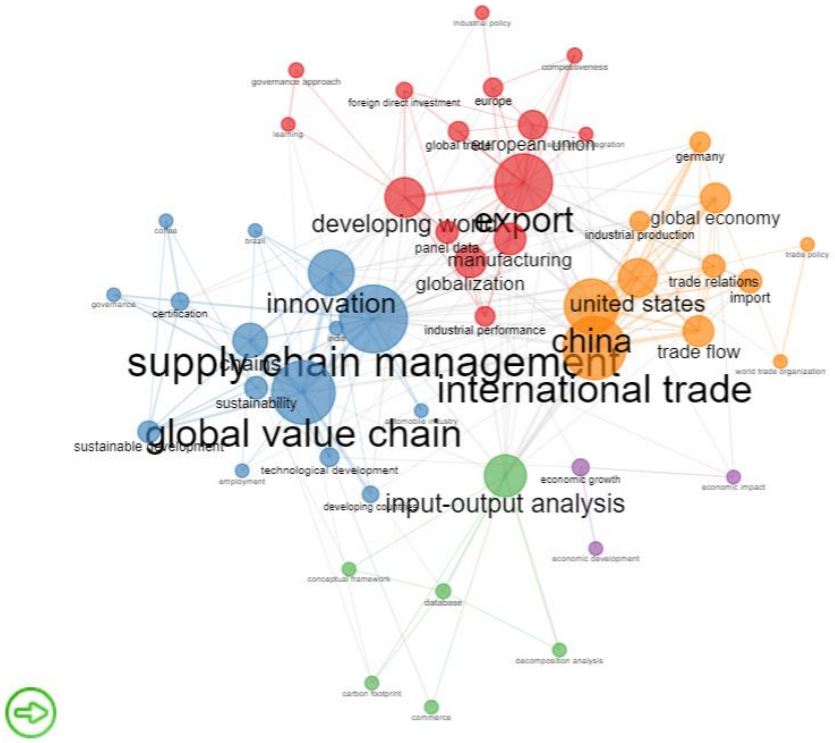

Figure 15

Thematic Map. Thematic maps are constructed as 2-dimensional graphs (Cobo et al., 2011). Research themes can be generated using co-word analysis to identify keyword clusters. Each theme is categorized into 4-quadrants on 2-dimensional graphs with centrality and density in figure 16. Every theme is shown on the graph like a bubble. “Global Value Chain and innovation”, “Developing World, Governance Approach and Industrial Performance"

“Input-output Analysis, Commerce and Decomposition Analysis” , “Supply Chain Management, Manufacturing and Industrial Production ” and “International Trade, Export and China” are noticed as blobs appear in the graph. The theme in the upper right quadrant, titled "Global Value Chain and Innovation", is designated a motor theme because of its high density and centrality. The researchers have extensively examined it, and it is at the center of the theme.

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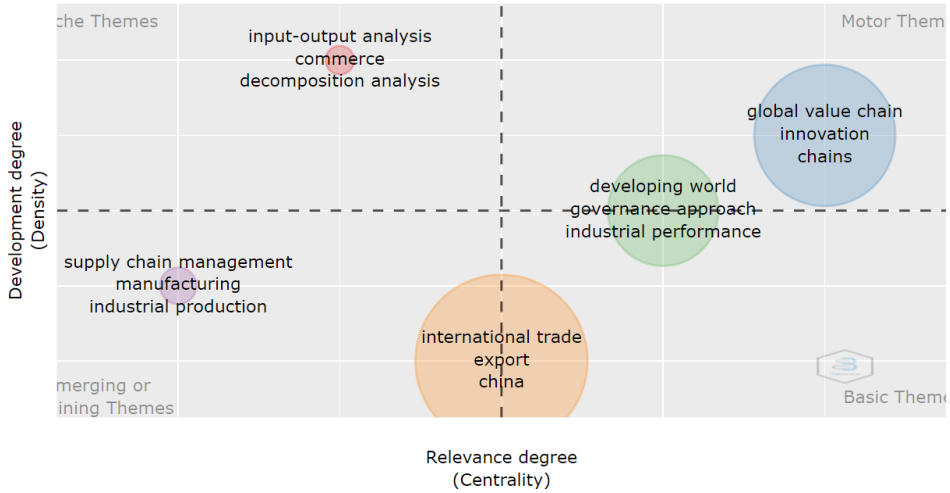

Figure 16

Among the underlying and transverse themes found in the lower right quadrant, International Trade, Export, and China is one, although not fully explored. However, these topics also relate to the lower left quadrant with other topics like supply chain management, manufacturing and industrial production, which is poorly developed and is of no consequence. It represents the emergence of a decline in links. Several prominent themes appear in both the upper and lower right quadrants, including governance approaches and industrial productivity. There is a niche theme on the upper left quadrant, input-output analysis, commerce, and decomposition analysis, which reveals interdependency but no externality, or is dispersed and of marginal relevance. A keyword with at least two occurrences is compiled and analyzed.

7. Intellectual Structure

Since many authors' work shows an affiliation between their research and organizations, they hold a strong influence within research-oriented communities (Cobo et al., 2011; Mendes et al., 017). Citation and co-citation analysis determine several aspects of a given topic, which is called the Intellectual Structure. In a Citation analysis, citations are analyzed according to their relevance to a researcher's research perspective (Rodr Guez-Ruiz et al. 2019). During scholarly studies, it is most valuable for the research community to cite documents of higher quality. The degree of cocitation (Small 1978, Edge 1979) indicates the strength of the relationship between articles as perceived by the citation authors. There are several co-citations when most articles are cited together, and these publications address the same recurring topic (Liu et al., 2013). In addition to illustrating how the cited papers are adapting to evolving research patterns, it highlights the relationship between authors, articles, and journals.

8. DISCUSSION AND CONCLUSION

The landscape of Global Value Chains is evolving, shifting away from the model where numerous independent firms operated. Instead of deriving value from disparate processes, the approach now emphasizes integrating the participants engaged in these processes (Ranjan and Read, 2016). To thrive in

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the market and create value, it is imperative for firms engaged in similar activities to strike a balance between competition and cooperation (Giuliani et al., 2005), ultimately establishing a mutually beneficial business context (Crick et al., 2020). The integration of industry networks is suggested in numerous papers, including Humphrey and Schmitz (2002), may result in a positive effect, generating new opportunities for growth (Gereffi, 1999, Giuliani et al., 2005).

Employing bibliometric analysis, it thoroughly explores the conceptual and intellectual structure within the realm of global value chains literature. In a relatively short timeframe, the academic community has displayed substantial interest in addressing a significant issue. Humphrey and Schmitz's pivotal work in 2002, widely regarded as one of the most influential studies in this field, has acted as a catalyst for a rapid increase in publications. This is notable considering the conventional pattern for relatively new topics. Many of the referenced studies are primarily concerned with strengthening global value chains and optimizing their spillover effects (Humphrey and Schmitz 2002). Historically, discussions surrounding global value chains have unfolded along two parallel strands: international trade with well defined in the domain of business management. This equilibrium between local and global trends has undergone transformation, subsequently impacting regional development.Furthermore, an entirely new field of study has developed, particularly inspired by the work of Gereffi G., the foremost expert on this subject, involving the Governance challenges faced by domestic partners working with affiliates overseas, which need to be addressed through appropriate policies and management practices. Based on all the bibliometric methods used, it is evident that the three closely related study areas are influencing all the conclusions.

These topics are addressed in the most prestigious research journals, especially those dedicated to developing countries. Documents and authors cited here are connected to theoretical and empirical frameworks. A variety of literature cites several keywords recurring in the work of different authors. This paper suffers from an inadequate choice of sources to review, which is its major shortcoming. It is true that Scopus contains most of the significant research papers in this area, however, significant papers are generally not listed there. Additionally, while it is not common, certain examinations may not contain keywords. If this occurs, it may affect the results of the document review process. Due to the nature of the study, interpretation of the numerous data graphics is inherently personal. Furthermore, since the topics are quite novel, the studies undertaken have also been limited by these limitations. The scientific production of this field is also difficult to separate by phases at present, since most of the work relates to recent years. It will therefore make sense to conduct a further analysis of the area to examine the potential development of the area of research. This is because the literature about this topic appears to be growing. The available data strongly points in that direction.

The current research topic necessitates a comprehensive literature review to offer deeper insights. Global Value Chains (GVC) offer a means to reconcile these conflicting developments due to their inclusive nature. The

documents analyzed in this study have raised new questions that demand exploration and resolution. The present advancements cannot be regarded as the definitive, and possibly not even the optimal, solution to this complex issue. The emergence of the COVID-19 pandemic has once again thrust this topic into the

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spotlight. Questions arise regarding the extent of countries' dependence on foreign aid in specific domains and the potential for enhanced international solidarity and cohesion if this path is pursued.

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