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MEASURING THE IMPACT OF GLOBALIZATION ON COUNTRIES USING COMPOSITE INDEXES

Literature
Review

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Abstract

Consumers, regulators, government institutions, and the media are all directly affected by globalization. Globalization is a recognized economic phenomenon that is often seen as a catalyst for national economic growth and development. The economy, politics, and society have become more intertwined in the last two decades. A trend in one part of the world quickly influences development in other parts. The COVID-19 epidemic is an excellent example of this interdependence. The purpose of this study is to systematically review the literature which deals with the study of composite indices measuring globalization and its impact. This is accomplished by collecting and classifying 65 peer-reviewed publications, primarily from Scopus, Web of Science, and Science Direct, and augmented by a search of existing databases and bibliographies. This review elaborates on the six widely cited globalization indexes. The study will contribute to existing literature and theories by documenting and comparing currently used composite indices. Findings show that despite its shortcomings, the KOFGI is the most popular index with sixty three percent of globalization studies citing it followed by ATK/FP as second most cited index.

INTRODUCTION

In a general sense, globalization has been defined as the increased worldwide integration of economic, cultural, religious, social, and political systems. However, globalization is a multidimensional notion that covers considerably more than commerce and capital flows. It is defined as the sum of interactions including residents of other nations talking with one another and exchanging ideas and information, as well as governments collaborating to address global political issues (Dreher, 2006). According to (Hauser, Urban & Weinberg, 1993), Globalization in practice is the ability of organizations and individuals being able to conduct nearly any kind of economic transaction across national borders thanks to the transnational single market established by globalization, which is based on the principles of free trade and is supported by dynamic flows of information interchange. Ever since the industrial revolution due to advancements in transportation and communication the phenomenon of globalization has accelerated. Advancements in transportation from steam locomotives, steamships, jet airplanes, and container ships, etc. have revolutionized the way we travel and send things around. Similarly, the evolution of the telecommunication sector from telegrams to landlines and the introduction to the advancement of the internet have transformed the way we communicate, shop, and travel. Novel technological developments have shifted this concept to the next level and with each passing day, advancements are being made. The term globalization was first used in the early part of the twentieth century and is thought to have evolved from the French world mundialization (Mundial meaning world), however, the terms gained popularity in the 1990s (Gygli, Haelg, Potrafke & Sturm, 2019). The origin of the concept is traced by some academics to as early as the era of European discovery and voyages to the new world. But it was not until the 1820s which witnessed large-scale globalization with the expansion of world economies and culture which was massively accelerated in the late 19th and early 20th centuries.

The phenomenon of globalization has many aspects and has been studied using various dimensions. The International Monetary Fund (IMF) in the year 2000, identified four aspects of globalization, which are Movement and migration of people, trade, and transactions, Movement of capital and investment, and dissemination of knowledge. One method to illustrate, monitor, and communicate complex issues or concepts that demonstrate multidimensionality, such as globalization, is composite indicators (CI). As per the OECD (2008) indices are mathematical or computational models, which include multiple subjective choices of the

modeler in the construction process. One such index is the KOF index of globalization (KOFGI) is another widely used academic index for studying globalization, this index studies three aspects of globalization: social, economic, and political (Troto, 2021). The data about various countries are also widely available for most countries in the world and the index ranks each country using a scale from one to 100. Using various databases data from the year 1970 till 2020 is available which can be construed as the level of globalization for each country. This comes as no surprise as it is one of the key factors that affect economies today and measuring it reveals a lot about successful government policies or otherwise.

Another example of globalization is the social media apps, they were introduced just a few decades ago and have revolutionized communication. The evolution of social media touches technological, economic, social, and political aspects of globalization simultaneously. Similar technological platforms have meant that the classic concepts of international trade and exchange of ideas, beliefs, and culture have been replaced by fresh ones (Sergey, Julia & Alexey, 2019). But many view globalization as an economic process of integration and interaction with cultural, religious, and social aspects. An analysis of the history of globalization reveals many disputes and diplomatic endeavors which does not have an economy at its core. However, concerns remain that it is a tool of Western imperial hegemony (Daly, Ullah, Rauf, & Khan, 2017).

Economic globalization has been a topic of interest for economists for a couple of centuries and even data from the 1900s is available for certain economies. In terms of economy, globalization involves goods, services, data, technology, and economic resources of capital (Apostoaie, 2012). One of the main concepts that have altered the classic concept of economic globalization is E-commerce. E-commerce and E-services are defined as the process of buying and selling goods and services electronically utilizing the internet. There are hundreds of online marketplaces today, some of the renowned ones are Amazon, eBay, Ali Baba, etc. As per the website Statista for the year 2021, Revenue in the e-commerce market is projected to reach US\$3,284,927 which is a sizable part of the global economy. This revenue is projected to reach a market volume of US\$4,230,885m by 2025 with a projected growth rate of 6.53%. For the year 2018, the percentage of consumers who made at least one purchase online in the previous year grew to 93% of internet users in the U.S., 97% in the UK, and 92% in China. The market of developed countries is in its maturity phase, competition amongst various sellers is extremely high and cost intensive (Sergey et al., 2019). Another useful index used for studying the

level of globalization of various countries is The Maastricht Globalization Index (MGI). Unlike the KOFGI, the MGI measures globalization along five dimensions: political, economic, technological, environmental, and social, and cultural.

Political globalization can be seen as a tension between three processes that interact to form the complex field of global politics: geopolitics, normative culture, and polycentric networks. The worldwide development of democracy based on the parliamentary nation state is without a doubt a major aspect of political globalization (Caselli, 2012). The evolution of a global standard of life is a second aspect of political globalization. This has nothing to do with geopolitics, yet it is often addressed in international political discourse while being inappropriate in numerous nations. Human rights, which are central to a cosmopolitan perspective, are one manifestation of this, but environmental concerns, which have also gone global, are another (Beckert, 1999). Moreover, this feature of globalization is unrelated to the West. The various facets of political globalization are not independent of one another; rather, they are the result of globalization and are intricately linked. For instance, international civil society is not distinct from geopolitics, but it does exist in a realm outside nation-states and the international marketplace. It coexists with states and has significantly pushed international politics toward multilateralism and international solidarity (Postelnicu & Calea, 2019).

RESEARCH METHODOLOGY

Fink (2020) says that a literature review is a systematic, clear, and repeatable way to find, evaluate, and explain the current body of literature written about a subject. The author examined existing literature, primarily from research papers, aided by books, news articles, websites, journals, reports, and other relevant material on the topic to understand the concept and further explore globalization using various indexes. The papers adopted the five-stage review methodology outlined by (Saunders, Lewis, & Thornhill, 2019) for the study. The adopted methodology is further augmented by adhering to the well-established literature review methodology (e.g., (Tranfield, Denyer, & Smart, 2003); (Choi, Wallace, & Wang, 2018), which outlines that a sound literature review must include planning, conducting, and reporting phases. Adopting this methodology enables us to search, collect, and analyze target publications for in-depth analyses and to deliver major implications and contributions to the research domain based on selected studies. The method used is based on the guidelines set out by (Saunders et al., 2019), which say that a literature review has five steps:

1. Formulating research questions;

2. Searching for relevant literature from online and other sources;
3. Selecting and evaluating studies based on criteria of inclusion and exclusion;
4. Analysis and synthesis;
5. Reporting the results.

As a first step, the research agenda was set by defining the research questions, which are as follows:

How has globalization evolved historically? What are the various dimensions of globalization?

What approaches and methods have been used to measure globalization?

What are the most cited globalization indices and what are their components?

How do the most frequently cited globalization indices compare with one another?

Why are globalization indices useful for examining the effects of globalization?

A systematic review of the literature does not require a specific type of analysis but rather a well-structured approach that includes classification, categorization, coding, synthesis, and separate reporting of the results (Cai & Lo, 2020). Following the five-step procedure, the first task of the planning phase is to find appropriate search terms for the investigation. A thorough literature review was conducted to gain a comprehensive understanding of the Globalization Index. The methodology included searching for the terms "Globalization," "Impact of Globalization," "Economic Globalization," "Social Globalization," "Globalization Index," and "Technological Globalization," etc., by using five important web databases, including Scopus, Web of Science, JSTOR, ProQuest, and Science Direct.

In the conducting phase, target papers were identified initially, followed by the establishment and implementation of inclusion and exclusion criteria. The chosen criteria required the specified keywords to appear in the title, abstract, or keywords. The search was limited to papers written in English or including some English-language content. The results were filtered to include only research articles in the subject areas of economics and business management. After applying the filters, the results still contained publications that did not comply with the paper's scope and were therefore excluded.

Inductively, comprehension and setting of the categories were formed or amended based on the findings of the articles. Before entering essential data into Excel sheets, the author thoroughly read the publications. The data were organized into rows and columns, starting with descriptive information, and progressing to more specific information about the study's objective, findings, and other trends. In the reporting phase, a descriptive analysis is performed to reveal the statistical characteristics of the search results, such as publication years, journal source titles, research topics, and key findings. After

applying a relevance filter, 65 research publications that were identified and critically evaluated, five commonly used and cited composite indices were selected. The technique employed by each index and the elements and sub factors comprising a composite index were analyzed. The study ends with a comparison based on debates and a critical look at the literature indexes that are available.

DISCUSSION

Globalization is not a novel concept but has existed for long. In ancient times, travelers used to travel long distances bringing products from one country to another. A notable example of such international trade was the ancient Silk route. The industrial revolution in the 19th century advanced transportation and communications which led to ease of trade across borders. Investopedia has defined Globalization as the spread of products, technology, information, and jobs across national borders and cultures. In economic terms, it describes an interdependence of nations around the world nurtured through free trade. By this definition, the products, or concepts such as the Internet, E-commerce, digital currency, cryptocurrency, telecommuting or remote work, online education, tourism, etc. all come as consequences of globalization. Each of these products or concepts requires an individual and comprehensive study to be fully comprehended. Examining their correlation with globalization seems intriguing but a daunting task, when considering its scope. (Rodhan & Stoudmann, 2006) state that globalization is not a set concept that can be defined using a single concept with a set period and neither is it a process that can be clearly defined with a clear beginning and end. This is an effective way of defining the concept of globalization as otherwise its complexity and impact cannot be gauged fully. However, this statement lacks any clear definition and raises the question of what exactly the concept of globalization encompasses.

As per (Nikitin & Elliott, 2000), globalization encompasses economic integration of different nations across borders, transfer of knowledge and policies, export and import of cultural, political, and social values, incorporation, and operations of businesses across many countries, and strives towards the establishment of a global economy free from socio-political interference. As per this explanation some areas of study under the concept of globalization overlap with cultural, religious, social, technological, economic, and political spheres of study. It can be concluded from the above statements that the concept of globalization is too vast to be studied under one study, therefore, this paper will only study the composite indexes used to

measure the level of globalization of different countries.

Before delving into the discussion of composite indices we must first explore various aspects or dimensions of globalization. This is important because each of the indices discussed later measures globalization in terms of various dimensions and each dimension is further explained by sub-factors. The most used dimensions of globalization include cultural, economic, political, technological globalization. Cultural globalization means the way we exchange ideas, meanings, and values around the world which intensifies and extend social relationships. The world is moving ever closer in terms of cultural consumption through the internet, popular media, and tourism. Concepts such as cross-cultural communication which studies how people from diverse cultural backgrounds communicate amongst themselves and with others have gained traction. Companies such as McDonald's have been looked upon as symbols of globalization and the evolution of a globalized society. One can now eat sushi in Germany as well as in Japan and watch Walt Disney movies in most countries around the world. Cultural globalization has impacted religious practices and thoughts leading to people learning about different religions and the genesis of occupations such as TV evangelists and religious YouTube channels. Likewise, in sports, we have global events like the Olympics, FIFA world cup, and world championships for many sports. One criticism cultural globalization received over the years was Americanization and Westernization because of cultural globalization. That dominant cultures that are economically and politically stronger may diminish or wipe out local culture and traditions. However, UNESCO report titled "International flows of selected cultural goods and services, 1994-2003", released in the year 2005 showed that cultural exchange is becoming more frequent from Southeast Asia, but the western countries still dominate the cultural exports. The above discussion succinctly reveals that globalization is a diverse phenomenon that relates to the multilateral world which affects the culture, politics, and economy of countries.

Another frequently discussed dimension of globalization is political globalization; one key aspect of political globalization is the decline of the national government or nation-state and the emergence of other factors that influence the political scene. The Canadian author William R. Thompson defined political globalization as "the expansion of a global political system, and its institutions, in which inter-regional transactions (including, but certainly not limited to trade) are managed", (Roudometof, 2010). Political globalization entails that the more globalized a country is in political terms the more interactive and integrated its political bodies are nationally,

regionally, and internationally. Also, the active participation, presence, and contribution of international organizations such as organs of the United Nations, NGOs, philanthropic foundations, etc. are directly proportional to its political globalization. Since international organizations have greater access to resources and expertise it is beneficial for the host country to have them operating there.

COMPOSITE INDICES MEASURING GLOBALIZATION

Various approaches have been adopted to measure globalization and its impact on different countries. As per (Guillen, 2001), globalization is overly complex and has multiple dimensions, it also has hundreds of definitions, one can hardly expect one single and the uniform measure would measure it. Similarly, (Caselli, 2006) has stated that finding an instrument to measure such a complex phenomenon as globalization is a fascinating and demanding challenge. Some authors have gone as far as stating that globalization is immeasurable. As per (Zhou, Biswas, Bowles and Saunders, 2011), measuring globalization is so difficult because it exists at a level that makes measurement difficult, for example, cross-border environmental issues, cultural transformations, and global consciousness. Nonetheless, scholars have worked on devising various methods to measure globalization; the most common approach taken has been the development of globalization indices. Indices can be simple (that include measuring economic openness, FDI, and flow of capital to GDP) or indices can be compound. The following is a discussion on some of the most popular, frequently used, and cited indices measuring globalization:

KOF Globalization Index (KOF)

KOF index was developed at the Swiss Federal Institute of Technology and Swiss Economic Institute, Zurich by Professor Axel Dreher, and his team. KOF Index was introduced in 2002, revised in 2007 and 2013. KOF index revised in 2013 has accumulated twenty-three variables to the overall index and three sub-indices covering economic, social, and political dimensions of globalization. Economic globalization has two main components one actual flows and restrictions. Social globalization has three components i.e., data on personal contacts, data on information flows, and data on cultural proximity. Political globalization includes four variables: embassies in a country, membership in international organizations, participation in UN security council missions, international treaties.

Maastricht Globalization World S (MGI)

Developed at the International Centre for Integrated assessment and Sustainable development (ICIS), Maastricht University, the Netherlands was one of the earliest methods developed by (Martens & Zywiets, 2006) that utilized a multifactor approach towards measuring globalization. It used socio-cultural, technological, ecological, political factors and integrated them as an index. The index used various indicators, for example measuring global politics it counted the number of embassies in a country and memberships in international organizations. For measuring organized violence, it counts the trade of arms as a percentage of military spending, for global trade measuring the imports plus exports of goods and services as a percentage of GDP, for global finance measuring foreign direct investments and gross capital flows as a percentage of GDP. It measured people on the move by counting the number of foreign-born residents as a percentage of population plus international tourists visiting the country plus departures per one hundred inhabitants. For technology, counting the net users of phone and internet, for environment measuring ecological defects (Martens, Dreher and Gaston 2010); (Martens & Zywiets, 2006). The breakdown of factors and sub factors used by MGI is given in the Table 1 Maastricht Globalization Index (MGI) indicators. Although the MGI Index is quite like the KOF Index of globalization there are several notable differences in methodology and factors. For example, the MGI index has included an environmental dimension and another difference is the choice of whether to adjust variables included in the indices for countries' geographic characteristics.

A.T. Kearney/Foreign Policy Magazine Globalization Index (ATK/FP Index)

ATK/FP Index was published from 2001 to 2007 was also amongst the first attempt to use indices to explain globalization. The variables used by the KFP index, the internet is treated as a single variable with double weightage than all other variables that have single or double weight. Critics of the KFP index such as (Lockwood, 2004) have argued that the index has failed to evaluate policy and instead measure outcomes. For example, the index uses total trade (imports plus exports as a percentage of GDP) to measure the openness of trade which depends not only on the trade policy of the country (tariffs and trade barriers) but also depends upon the geographical and economic characteristics of a country. Another critique is that the weights assigned to the variables are arbitrary and lack justification either by prior reasoning or statistical proof.

Ernst & Young's Annual Globalization Index

(Young, 2012) globalization index were published by Ernst & Young in the year 2012. The index was

developed by the economic intelligence unit for Ernst & Young and measured data from the sixty largest countries/territories by GDP and ranked them according to their degree of globalization. The factors that are included in the Index include: share of main trading partners in total trade, as a percentage of GDP (trade in goods and services); trade-in information and communications technology (ICT) goods, as a percentage of GDP (technology); foreign direct investment (FDI) stocks, as a percentage of GDP (capital and finance); and total international fixed telephone traffic (culture). The last two of these variables are substitutions for FDI flows as a percentage of GDP (capital and finance) and international outgoing fixed telephone traffic (culture).

Global economic integration index (GEII)

The Asian development bank (ADB) developed a globalization index and published via the ADB Economics Working Paper Series (Huh and Park, 2019). The findings suggest that GEII has received little attention in contemporary research due to its focus on economic outcomes of globalization (Barış, 2019). The ADB developed a new composite index of globalization based on data on 158 economies over the period 2006–2014. The index was developed to study the possible impact of globalization on economic growth and income inequality. The index used twenty-five indicators representing the key socioeconomic components of global integration. Principal component analysis was used to weigh each component and construct an aggregate measure. The study used a different methodology than other indices by incorporating the contributions of intraregional and extra-regional integration factors. The GEII has listed twenty-five indicators organized into six dimensions i.e., trade and investment integration, money and finance integration, the value chain, infrastructure and connectivity, movement of people, and institutional and social integration. The index focuses on the economic impact of globalization with particular emphasis on economic growth and income inequality. Many previous attempts at developing the globalization index have tried to take a comprehensive approach, however, none included the accumulation of regionalization, (Martens, Caselli, Lombaerde, Figge and Scholte, 2015).

World Market Research Centre Index (WMRCI)

The globalization index by World market research Center or WMRC Index (Lombaerde and Lapadre, 2008) was developed by a London-based research institution in 2001. The index analyzed 185 countries in terms of their businesses, governments, and financial institutions in terms of their level of globalization. However, the index has received criticism because of its narrow scope and limited application. WMRCI is one of the least cited indices,

the reason is its narrow scope because it mostly focused on economic factors i.e., 90 percent of factors are economic. The other ten percent focuses on internet and telephone usage. The index has two dimensions "Old Economy" and "New Economy" with each dimension listing a total of 6 variables, three for each dimension.

RESULTS AND FINDINGS

The number of chosen articles published over the years is shown in Figure 1. It indicates that over 78% of the articles were produced during a period of 15 years (2003–2018) due to the high interest in globalization studies. During the previous three years (2019–2022), the number of publications show a decreasing trend. Figure 2 depicts the Distribution of articles according to Globalization Indices studied and the most cited Globalization Indices. Figure 2 illustrates that 30% of the studies were based on Measuring Globalization, while 31% of the studies include Multiple Indices. Furthermore, most of the studies that examined multiple Indices also include KOF globalization index, making KOF globalization indices as the most cited index, while the Maastricht Globalization Index, which comprises only 3.5%, is the least cited GI. Over 13% of studies has elaborated upon A.T. Kearney/Foreign Policy globalization index.

The results indicate that from Table 8 it can be noted that 14 studies have elaborated on KOF index exclusively. Whereas, after analyzing the studies enlisted via Table 7 it is noted that 88% studies elaborating upon multiple indices have included KOF index as one of the indices being used for empirical studies as well as qualitative analysis making it most cited globalization index. Less than five percent articles included in the review has discussed MGI, the lack of interest may be attributed to inclusion of hard to measure dimensions included in the index, the findings are in line with previous study conducted by (Martens & Raza, 2009). Findings show that despite its shortcomings, the KOFGI is the most popular index with sixty-three percent of globalization studies citing it followed by ATK/FP as second most cited index.

The results of the study suggest a positive impact of globalization on economic growth with intra-regional integration playing a key role.

Any examination of existing indices must examine globalization definitions used by MGI, WMRC, ATK/FP, and KOF indices when measuring globalization. The WMRC G-index is significantly weighted by economic considerations, as is the ATK/FP index. Globalization, internationalization, and liberalization are indistinguishable with these indices. This doesn't mean country-level data is useless. Both indices fail to properly define their assumptions and constraints for measuring

globalization. Any measurement of globalization should include all countries. The WMRC index covers 185 countries, compared to the ATK/FP index with its 62 countries. According to (Kluver & Fu, 2004) culture is the most apparent manifestation of globalization. Despite culture's centrality to globalization, no one has created an adequate metric. (Martens, Pim & Zywiets, 2006) sidestep the issue by saying culture and communication have insoluble ambiguity. (Kluver & Fu, 2008) created a Cultural Globalization Index. They say it's impossible to directly measure cross-border cultural dissemination. They employ cultural proxies to transmit ideas, beliefs, and values. Although cultural globalization is well-defined, empirical metrics are lacking. All other metrics lack systematic data sources, so the authors use book and brochure imports and exports. The top-ranked countries are wealthy and English-speaking. Not measuring cultural influences risks downplaying its relevance. The indices should include a discussion of cultural globalization. The KOF Index's "social globalization" sub index includes cultural indicators. Indicators include McDonald's per capita, Ikea per capita, and book sales (as a percentage of GDP). This sub-index shows how globalization affects economic and social aspects. The MGI is different because it looks at both the environment and organized violence as factors that affect the overall result (Gaston, Dreher & Martens, (2015)). Most globalization indexes use subjective a priori weights that are hard to defend analytically. Additional distortions are introduced since the indicator values have various means and variances, which affect the weights. The choice of normalization method affects the extreme values and relative weights of indicators, which decreases robustness (Gaston et al., 2015). An interdisciplinary approach is needed to answer new issues about globalization's nature. Sociologists, science and technology critics, economists, and others must work on similar concerns. As with other complicated issues, globalization needs academics and professionals to cross disciplines. This gap can be closed from our perspective. A composite globalization index can reconcile multifaceted approaches. Conceptually analyzing and formulating matters for an index leads to measurement. Rather than being opposed to the prospect of measuring globalization, optimism is required to make the measurement advances required to understand globalization. ATK/FP, WMRC, and (recently) KOF all use single-year data (Martens et al. 2015). This is not a problem when indicator values vary slowly or reflect a clear trend (life expectancy changes by a few percentage points per year, for example). When figures are fluctuating, this adds uncertainty. Finally, in any undertaking to measure globalization the methodology should be clear and transparent to facilitate open discussion.

The ATK/FP, KOF Index, and MGI include methodological disclosures, however the WMRC does not (such as the choice of extreme values).

CONCLUSIONS

It is evident from the material presented above that most of the research is concentrated on six Globalization Indexes i.e., Maastricht Globalization World S (MGI), A.T. Kearney/Foreign Policy Magazine Globalization Index, KOF index, Ernst & Young's Annual Globalization Index, Global economic integration index and World Market Research Centre Index. After a comparative analysis of various indices listed above the first point of comparison is the definition used by each index for Globalization. Nearly one third of the articles selected are based on studies that discuss the most effective way the concept of globalization can be quantified.

The WMRC uses a very narrow scope for defining globalization whereas the MGI and KOF index has overly broad definitions, enlisting many factors. All indices used failed to differentiate between globalization and internationalization. This does not imply that data collected, and comparison made using these indices is completely useless, but the factors included must be clearly defined and their inclusion should be justified. Only WMRC included 185 countries which are closest to including all countries recognized by the United Nations. On the other hand, the generalizability of the EY Globalization index is quite narrow as it included only sixty countries for comparison. By excluding most developing nations, the utility and application of the index become quite limited. Although most academics including (Martens & Zywiets, 2006) agree that "culture is the most visible manifestation of globalization", no index has successfully developed an adequate solution for its measurement. Upon closer inspection of the country ranking, it is revealed that affluent and English-speaking countries are ranked higher on all indices which may indicate a biased criterion. As per (Gaston et al., 2015), the KOF index included the number of McDonald's restaurants per capita, the number of Ikea outlets per capita, and the number of books traded (as a percentage of GDP). A country that does not allow McDonald's to operate inside its territory due to political, geographical, cultural, or any other reason will, in turn, be branded less globalized than a country that does have a McDonald's franchise. This indicates a flawed approach that does not account for political, cultural, and geographic differences while measuring globalization. Another point of difference is that only a few indexes include environmental factors whereas others have completely ignored them. An important critique of globalization indices cited in the literature by

researchers such as (Houseman & Mandel, 2015) is that the indices MGI and ATK/FP measure regionalization and internationalization instead of globalization. For example, the top ten countries classified by MGI contain only European countries which might be because these countries are part of the European Union. Most indices take the number of embassies as the level of globalization while failing to consider supra-territorial indicators. Although a measure such as the number of embassies is not inherently a bad measure of increasing cooperation and integration this approach fails to account for geographical and territorial contingencies.

The adoption of broad composite indexes to measure how globalization affects economic growth and income inequality can be preferable to using single proxies for globalization, particularly when studying the economic aspects of globalization, (Huh and Park, 2019). Most of the compound indices avoid answering the question of whether globalization is good or bad. There is no obvious answer to this question but most of the neoclassical literature such as (Sachs, Warner, Aslund & Fischer, 1995) view the openness of the economy as unequivocally positive. However, authors such as A.G. Frank and others that proposed the dependency theory state that openness of economies would eventually lead to exploitation by more powerful countries, (Rodhan & Stoudmann, 2006; Kimmel, 1991). Globalization is a function of the global paradigm hence it is inherently biased and depends on the world view of the author. Measuring globalization as per (Daly et al., 2017) that used an econometric framework suggested that the impact of various aspects of globalization such as political, economic, and social are different in terms of their benefits and drawbacks. The study suggests that political and social globalization have beneficial effects in the short run but overall, it leads to an increase in unemployment rates. Whereas economic integration has significant long-term benefits eventually in co integration with other aspects of globalization. In the study, the indexes have been described as mutually exclusive, although in fact, there are regions of overlap between them. It may be difficult to distinguish one theory from another. Nonetheless, this study has attempted to demonstrate the variations between the ideas concerning strategy and conception.

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LIST OF TABLES

Table 1
Research Work- Studies about measuring Globalization (Journal Articles)

S.No	Author (Year of publication)	Title	Key Findings
1	Putko, M. (2006).	Defining and Quantifying Globalization	Globalization has not agreed-upon definition or measurement. Globalization is so nebulous and inclusive that it is hard to support hypotheses with evidence. Policymakers must understand globalization. This paper discusses defining and quantifying the phenomenon.
2	Gomez, D. M., Ortega, Guillermo J.;Torgler, Benno (2011)	Measuring globalization: A hierarchical network approach	Using the co-movement of business cycles across countries and regions, globalization is quantified. Contrary to other empirical studies, globalization is driven more by regional growth patterns than by global synchronization.
3	Osode, O. E., Iheonu, C. O., & Dauda, R. (2022)	On the relationship between globalization and income inequality: Does institution matter?	Papers studies the impact of globalization and institutional quality on income inequality as well as the impact of institutional quality.
4	Kluver, R., & Fu, W. (2008)	Measuring cultural globalization in Southeast Asia	Globalization promotes change, growth, and participation. Anecdotal/economic. This paper analyze Globalization trends help policymakers. Globalization's consequences. Globalization indicators include FDI, money flows, and migration.
5	Landefeld, J. S., & Whichard, O. G. (2006)	The importance of, and pitfalls in, measuring globalization	This article examines international trade, FDI, and MNCs. The study discusses measurement of globalization indicators. Topic is US data development.
6	Makhija, M. V., Kim, K., & Williamson, S. D. (1997)	Measuring globalization of industries using a national industry approach: Empirical evidence across five countries and over time	This study uses international links and value-added activities to examine globalization (IIT). Porter and Bartlett's globalization theories are evaluated.

7	Marginean, Silvia (2015)	Economic globalization: From microeconomic foundation to national determinants	Globalization fueled expansion. Globalization's benefits were questioned in 2009. This analysis finds microeconomic drivers more relevant than macroeconomic forces.
8	Pim Martens, Marco Caselli, Philippe De Lombaerde, Lukas Figge, Jan Aart Scholte (2015)	New directions in globalization indices	This study measures globalization. Policy and research use globalization indexes. Local, national, regional, and/or global cultural, ecological, economic, political, and/or social units are highlighted. This study suggests adding globalization indicators. Quantifying and analyzing globalization are possible.
9	Akram, M., Faheem, M. A., Dost, M. K., & Abdullah, I. (2011)	Globalization and its impacts on the world economic development	Globalization's effects on the planet remain unclear. Globalization is spreading despite its limitations. This paper defines Globalization. How does it affect commerce, FDI, and growth?
11	Osinubi, T., & Asongu, S. (2021)	Globalization and female economic participation in MINT and BRICS countries	This study covers 2004 to 2018. Social globalization in MINT and BRICS does not assist FEP. FEP does not affect globalization. MINT and BRICS must support women. Originality/value Examine globalization's effects on MINT and BRICS FEP.
12	Salifou, C. K., & Haq, I. U. (2017)	Tourism, globalization, and economic growth: A panel cointegration analysis for selected West African States	Fully modified and dynamic ordinary least squares are used in this paper to show that physical capital, tourism, and globalization all help the economy grow.
13	Sergey, S., Julia, Z., & Alexey, A. (2019)	Measuring Globalization: network approach to countries' global connectivity rates and their evolution in time	Globalization indexes. This research presents a novel method for gauging global connectivity based on trans-border flows and relationships. k-core measures global network participation. Changing a country's network structure can alter its position. The paper studied products, services, FDI, and migration networks.
14	Tešić, J. (2012)	Measuring Globalization in The Context of Transition Process-The Case Of Western Balkan Countries.	This research investigates Western Balkan globalization and macro measurements. Globalization indexes must include transitioning nations.

15	Tijssen, R. J., Waltman, L., & van Eck, N. J. (2012)	Research collaboration and the expanding science grid: Measuring globalization processes worldwide	A 'grid' of research sites and networks examines collaborative science globalization trends. Global sharing has not changed despite growing distances between research groups. International distances and expenses vary. Global collaboration shapes science's fabric.
16	Tsai, P., Huang, C., & Yang, C. (2012)	Impact of Globalization on Income Distribution Inequality in 60 Countries: Comments	Globalization does not aggravate economic disparity in sixty countries, demonstrating that their conclusion is wrong since they incorrectly lumped countries with different economic systems. Only high-income countries gain from globalization's revenue allocation.
17	Whichard, O. G. (2003)	Measuring globalization: the experience of the United States of America	This article discusses data collection programs for globalization for US firms, abroad affiliates, and foreign US affiliates. It also covers data structuring for analysis, the extraction of analytically significant metrics from data, and the performance and facilitation of data-driven research.
18	Williams, J. F., & Brunn, S. D. (2004)	Cybercities of Asia: measuring globalization using hyperlinks (Asian cities and hyperlinks)	This study looks at URLs that lead to websites of Asian cities with a population of over 750,000 and coorelation to globalization.
19	Yay, G., Tastan, H., & Oktayer, A. (2016)	Globalization, Economic Freedom, and Wage Inequality: A Panel Data Analysis	This study examines the effects of globalization and liberalization on wage inequality using the Fraser Institute's Economic Freedom Index (EFI), the University of Texas Inequality Project's Theil industrial pay inequality statistic, and the KOF globalization index (UTIP).
20	Zinkina, J., Korotayev, A., & Andreev, A. I. (2013)	Measuring globalization: existing methods and their implications for teaching global studies and forecasting	This study examines globalization rankings and course design. Systematically disclosing global flows and networks allows multidimensional globalization measurement, essential for formal explanations, hypotheses, and forecasts.

Source: Formulated by Author using Excel (2021)

Table 2
Research Work studies reviewing Composite Globalization indices

No.	Name of Author & Year	Title	Key Findings
1	Szabó, B. (2021).	Definition of Globalization in the Context of European Integration.	This paper provided a comprehensive overview of the existing definitions of globalization and introduce our proposed definition.
2	De Lombaerde, P. Lelio Iapadre (2008)	The world is not flat	Many globalization indicators do not consider the spatial aspects of international interactions. Space and distance play a key role in how globalization indicators are constructed, as the author shows.
3	Guillen, Mauro (2001)	Is Globalization Civilizing, Destructive or Feeble? A Critique of Five Key Debates in the Social Science Literature	Globalization is gaining attention in sociology, economics, politics, and culture. A comparative sociology of globalization sensitive to local variations, agency, interest, and resistance is urged.
4	Pim Martens, Axel Dreher, Noel Gaston (2010)	Measuring globalization - opening the black box. A critical analysis of globalization indices	New co-operative frameworks are needed to study and measure globalization meaningfully, with a view to advancing the understanding of globalization indices. This paper argues that it would be fruitful if academics, both quantitative experts and theoreticians, can work together on this challenge.
5	Nikitin & Elliott, J. (2000)	Freedom and the market	The anti-globalization movement is conducted from the perspective of the theoretical foundation of the evaluation of the dynamics of capitalism by Polanyi, Hayek, and Keynes. Its conclusions are brought to bear upon the validity of their contesting views of the relationship between economic efficiency and globalization.
6	Roudometof, Victor (2010)	Review of "Globalization as Evolutionary Process: Modeling Global Change	The paper develops a framework for understanding the origins and trajectory of contemporary world trends, constructing testable and verifiable models of globalization.
7	Samimi, P., & Jenatabadi, H. S. (2014)	Globalization and economic growth: empirical evidence on the role of complementarities	Globalization appears to affect OIC countries' economic growth statistically. This positive effect is more pronounced in countries with better-educated workers and well-developed financial infrastructures. Complementary reforms can boost economic growth along with globalization.

8	Daly Vince, Farid Ullah, Abdur Rauf, Ghulam Y Khan, (2017)	Globalization and Unemployment in Pakistan	Integration can affect unemployment positively and negatively. This study examines the economic, political, and social effects of globalization on Pakistani unemployment from 1980 to 2013. The results suggest that economic integration is short-term beneficial but long-term significant.
9	Hyeon-Seung Huh and Cyn-Young Park (2019)	ADB Economics Working Paper Series, A New Index of Globalization: Measuring Impacts of Integration on Economic Growth and Income Inequality	Globalization's positive impact on economic growth is most pronounced in high-income countries. Extra regional integration is primarily to blame for the widening of the income gap.
10	Almas, H., & Sangchoon, L. (2010)	The relationship between globalization, economic growth, and income inequality	A new globalization index based on economic growth is developed to investigate the relationship between globalization and income inequality. Indices are expected to aid in comparing the globalization process across countries and evaluating the impact of globalization on economic development and inequality.
11	Andersen, T. M., & Herbertsson, T. T. (2003).	Measuring globalization	An index of globalization can be created using the multivariate factor analysis technique. For 23 OECD countries, the index provides an alternative to the simple measure of openness based on trade.
12	Apostoaie, M. C. (2012).	Measuring economic globalization—facts and figures	In the paper, we use three new indicators to show economic globalization's impact on the global economy (and the Romanian economy): the KOF globalization index, the A.T. Kearney/Foreign Policy globalization index, and the CSGR globalization index. We included the M-GI and WMRC Index to show globalization's economic impact.
13	Iván Arribas, Francisco Pérez, Emili Tortosa-Ausina (2009)	Measuring globalization of international trade: Theory and evidence	Globalization is measured by the Standard of Perfect International Integration. We present openness, connectivity, and integration indicators for each country and the global economy. Our indicators used trade data from fifty-nine countries. Trade integration is higher than thought, according to traditional openness indicators.
14	Atif, S. M., Srivastav, M., Sauybekova, M., & Arachchige, U. K. (2012)	Globalization and income inequality: a panel data analysis of sixty-eight countries	A study compares income inequality in sixty-eight developing countries between 1990 and 2010. Globalization's effect on income distribution varies by country's structure and institutions. Variables do not have a simple, overarching relationship.

16	Vito Bobek, Romana Korez Vide (2005)	The signification and the feasibility of measuring globalization of economy	Study introduces a method for measuring globalization based on national competitiveness and economic growth. Sub index and global economy levels determine composite index weights. The joint composite index is dependable based on five sub-indices.
17	S. Caba (2013)	Economic crisis and globalization index dynamics	The 2011-2012 economic crisis created a new globalization-regionalization paradox. Global economic crises are managed regionally. Globalization's impact on different economies has been studied.
18	Shin, M. E. (2002)	Measuring Economic Globalization: Spatial Hierarchies and Market Topologies	In this study, international trade data and spatial data analysis are used to examine the patterns of economic globalization between 1970 and 1997. The authors argue that future studies could benefit from preserving topological relationships between countries in the global economies.
19	Ghemawat, P., & Altman, S. A. (2017)	Defining and Measuring Globalization	This paper begins by considering the etymology of "globalization" and how the phenomenon has been perceived by the public and in the media.
20	Gurgul, H., & Lach, Ł. (2014)	Globalization and economic growth: Evidence from two decades of transition in CEE	This paper examines globalization's impact on ten CEE economies' growth. We found compelling evidence of globalization's growth-stimulating effect using the Swiss Economic Institute's indexes. Political globalization was not statistically significant, according to any study.

Source: Formulated by Author using Excel (2021)

Table 3
Research Work on KOF Globalization index

No.	Author (Year of publication)	Title	Key Findings
1	Dreher, A. (2006)	Does globalization affect growth? Evidence from a new index of globalization	The study develops an index of globalization (KOF Index) covering its three main dimensions: economic integration, social integration, and political integration. Using panel data for 123 countries in 1970-2000 it shows that economic integration promotes growth. It also shows that political integration has no effect on economic growth.
2	Cervantes, P., Lopez, N. R., & Rambaud, S. C. (2020)	The Effect of Globalization on Economic Development Indicators: An Inter-Regional Approach	In 217 countries from 2000-2016, economic globalization affected per capita income and public health expenditures. The papers use the World Bank's World Development Indicators and KOF's Globalization Index.

3	Coulibaly, S. K., Erbao, C., & Mekongcho, T. M. (2018)	Economic globalization, entrepreneurship, and development	The paper analyzes the role the phenomena of globalization play in the rapid growth of BRICS1 (Brazil Russia India China and South Africa) countries? To test these claims, we use an unbalanced panel dataset for BRICS member states to estimate: a comprehensive globalization index (KOF)
4	Gygli, S., Haelg, F., Potrafke, N., & Sturm, J. E. (2019)	The KOF Globalization Index – revisited	The KOF Globalization Index was updated. The new index has forty-three variables, up from 23. De jure versus de facto globalization affects economic growth differently. The new KOF Globalization Index should be used to re-examine other important globalization consequences
5	Fang, J. C., Gozgor, G., & Nolt, J. H. (2019)	Globalization, economic uncertainty, and labor market regulations: Implications for the COVID-19 crisis	The effects of globalization on labor market regulations are examined empirically in this paper. Paper uses a panel dataset of 136 countries from 2000 to 2017 to examine new innovative globalization and economic uncertainty indices (the Revisited KOF Globalization and the World Uncertainty).
6	Gamze, Ö, Sevinç, D., & Sevil, G. (2019)	The Impact of Globalization on Corporate Taxation: Evidence from The KOF Globalization Index	As the world became more interconnected, tax policies changed. Several countries have lowered corporate tax rates in recent years. Globalization (KOF Index) and corporate taxes are correlated negatively. Consistent across globalization metrics.
7	Gozgor, G. (2018)	Robustness of the KOF index of economic globalization	The KOF indices, the most widely used globalization measures, use nominal trade openness to construct their globalization index. Globalization bias is reduced by using multiple trade openness measures. Logarithmic KOF economic globalization index improves panel data regressions' outlook.
8	Florian Hagel (2020)	The KOF Globalization Index - A Multidimensional Approach to Globalization	This paper explores the history and current application of the KOF globalization.
9	Hoang, H. (2020)	The underground economy in transition countries from the perspective of globalization: The case of Vietnam	Study uses qualitative and quantitative methods. We also used the ETH Zurich-Switzerland KOF Globalization Index in our analysis. Access to global markets has helped Vietnam's globalization, according to the study.

10	Kiani, A., Mohammad, N., & Soomro, R. B. (2021)	The Impact of Globalization on Human Development Index: A Case of Pakistan	1980-2014 globalization and HDI are compared. Globalize Pakistan's economy, society, and government. UNDP, SPDC, World Bank, and KOF. Others evaluated variable mobility. Based on ADF test results, ARDL was used to assess all independent variables' long-run impact on HDI.
11	Potrafke, N. (2015).	The Evidence on Globalization	Globalization affects the economy. KOF studies linked globalization to multiple outcomes. Globalization promotes progress, equality, and rights.
12	Troto, A. I. (2021)	Case Study on KOF Globalization Index for Greece, Czech Republic, Poland, Romania, and Hungary	Using the KOF globalization index, this article compares the markets of Greece, the Czech Republic, Poland, Romania, and Hungary after 1990, when they decided to westernize. The integration of EU markets is also being investigated.
13	Vinig, T., & Kluijver, J. d. (2007)	Does globalization impact entrepreneurship? comparative study of country level indicators	Globalization's impact on entrepreneurship has not been researched. Globalization is explored utilizing KOF globalization and entrepreneurship at the national level.
14	Zerrin, K., & Dumrul, Y. (2018)	The impact of globalization on economic growth: empirical evidence from the Turkey	Globalization slowed Turkey's development. Sub-indices "de facto" and "de jure" Full MOLS co-integration test Turkey's growth accelerated economic and social globalization. Globalization slows growth. Globalization limits economic growth says KOF. All KOF indices hurt growth.

Source: Formulated by Author using Excel (2021)

Table 4
Research Work on Maastricht Globalization Index

No.	Author (Year of publication)	Title	Key Findings
1	Figge, L., & Martens, P. (2014)	Globalization Continues: The Maastricht Globalization Index Revisited and Updated	This article presents a revised and updated Maastricht Globalization Index for 117 countries and three points in time-2000, 2008, and 2012-including a new calculation methodology and data.
2	Pim Martens, Axel Dreher, Noel Gaston (2010)	Globalization, the global village, and the civil society	We argue that socio-cultural factors not only change because of globalization, but can be causes, as well as challenges to the process itself. We describe how the recent introduction of the MGI, and KOF globalization indices can be used to empirically address to what extent globalization affects social phenomena.

3	Pim Martens, & Raza, M. (2009)	The Maastricht globalization index	This paper has updated and improved upon the Maastricht Globalization Index which measures the degree and change in globalization for several countries.
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Source: Formulated by Author using Excel (2021)

Table 5
Research Work on A.T. Kearney/Foreign Policy Globalization Index

No.	Author (Year of publication)	Title	Key Findings
1	Pim Martens, & Zywiets, D. (2006)	Rethinking globalization: a modified globalization index	This paper proposes a modified index for measuring globalization. It is based upon the A.T. Kearney/Foreign Policy Globalization Index but is improved both conceptually and operationally. Paper used data for 117 countries from a variety of resources to evaluate the robustness of the suggested index.
2	Heshmati, A. (2006)	Measurement of a multidimensional index of globalization	The two composite indices of globalization presented in this article are discussed. It is possible to get both estimates using principal component analysis (PCA) and the Kearney/Foreign Policy magazine, respectively.
3	Heshmati, A. (2003)	Measurement of a multidimensional index of globalization and its impact on income inequality	The paper reviews the Kearney/Foreign Policy globalization index. The analysis indicates which countries have become most globalized and show how globalization has developed over time.
4	Jiráňková, M. (2009)	The Opportunities for a Small Economy in Globalization [Příležitosti malé ekonomiky v globalizaci]	The essay discusses the role of small countries (under sixteen million people) in today's globalized globe. The benefits and drawbacks of globalization for these countries are examined. Globalization processes are depicted using the A. T. Kearney Globalization Index.
5	Kluver, R., & Fu, W. (2004)	The cultural globalization index	AT Kearney/Foreign Policy's globalization index measures financial integration, political commitments, personal contacts, and technological interpenetration to assess globalization. These factors indicate globalization. This index lacks culture.
6	Zhou, L., Biswas, B., Bowles, T., & Saunders, P. J. (2011)	Impact of globalization on income distribution inequality in sixty countries	This study examines globalization's effect on income inequality in sixty developed, transitional, and developing countries. PCA and Kearney make globalization indices (2002, 2003, 2004). Globalization and Gini coefficients are inversely related. Globalization lowers inequality

7	Lockwood, B. (2004)	How Robust is the Kearney/Foreign Policy Globalisation Index?	The Kearney/Foreign Policy (KFP) index of globalization is constructed by making some problematic assumptions. Paper proposes alternative measurement, normalization, and weighting rules, and using these rules, recalculate the ranking of the fifty countries, using the original KFP data.
8	Caselli, Marco (2006)	On The Nature of Globalization and Its Measurement. Some Notes on The at Kearney/Foreign Policy Magazine Globalization Index and The CSGR Globalization Index.	Globalization is a major phenomenon. Various researchers have developed measurement tools. This helps them gather as much data as possible. A.T. Kearney/Foreign Policy Magazine Globalization Index and CSR Globalization Index are described.

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LIST OF FIGURES

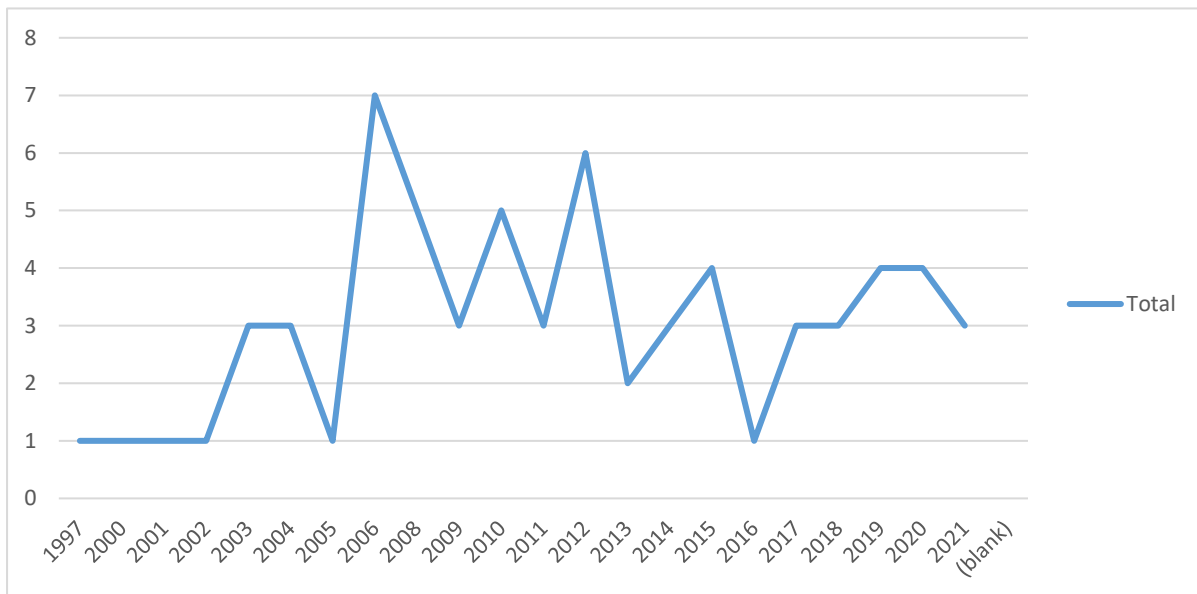


Figure 1
Number of selected papers published over the years
Source: Formulated by Author using Excel (2021)

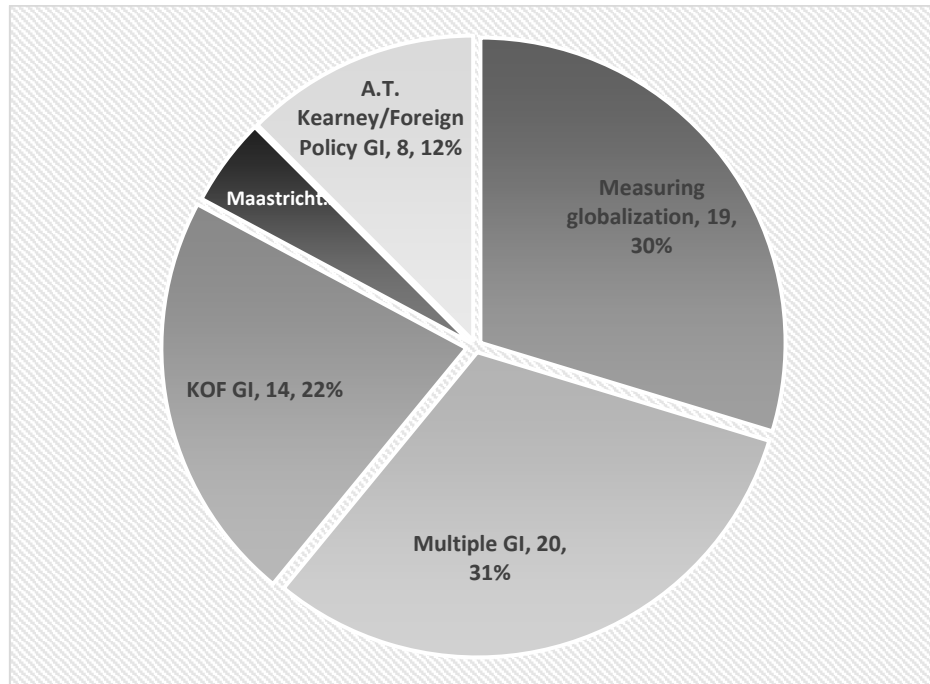


Figure 2
Distribution of articles according to Globalization Indices studied
Source: Formulated by Author using Excel (2021)