CHAPTER 3
OBJECTIVES AND METHODOLOGY OF THE STUDY

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Over the period of time, globalization with economic reforms in India has grown and evolved with greater dimensions as compared to the pre-reform period. India has made an improvement across all sectors leading to more growth and development. India's political relations with other countries of significance have become stronger. India has managed to overcome the balance of payment crises, and financial crises in the past. It has been able to withstand the ill effects of currency devaluation, rise in inflation, recessions, and decreasing growth rates. In recent years, the Government of India has managed to put more efforts towards liberalizing economic policies, and barriers to trade, establishing relations with foreign countries, and participating in more trade agreements and international organizations. These efforts have made India overcome the crisis and improve its position to stand against other competitive economies.

The review of related literature carried out in the previous chapter reveals that the relationship between globalization and economic growth is well established. However, most studies have examined the relationship either through trade or capital flows in cross-country scenarios. The studies on dimensions of globalization have focused on the trade channels. A few can be seen where apart from trade, financial, political, and social dimensions have also been used. These studies are based on the existing indices of globalization such as the KOF index developed by ETH Zurich, in Switzerland, which includes only three dimensions, namely, economic, financial and political. The studies that focus on social dimensions have used limited socio-economic indicators. There is a lack of studies that captures the overall effects of globalization in India. Over the years globalization has developed into a variety of meaningful channels. These channels can further be segregated into five dimensions namely, economic, financial, political, technological, and social dimensions. With these meaningful channels, a comprehensive study can be done in the context of India where the limitations related to the review of literature can be filled. The present study seeks to fill the gap by carrying out an in-depth analysis of globalization.

This chapter highlights the research gap, research questions, objectives of the study, and research design adopted to conduct the research. The research methodology section describes the methodology and statistical tools used in the study.

3.1 RESEARCH GAP

It is evident from the literature that the research done in the area of the impact of globalization in the context of the Indian economy is limited although 30 years have crossed since India embarked on the path of globalization. The following are the research gaps identified based on the literature reviewed:

- The majority of the studies have been done in the context of Latin American countries, European countries, and a group of select underdeveloped countries of Africa and Asia, and a few have been carried out for OECD countries.
- The literature relating to globalization is limited to specific indicators such as trade, FDI, and FII, and no study has been found that examines globalization in its entirety.
- Studies related to India are largely centered around examining globalization in specific sectors rather than the entire economy.
- Few works of literature based on dimensions of globalization weave an interlinkage between them using econometric analysis.
- The majority of the studies to analyze the extent of globalization rely on the synthetic indices constructed based on panel data. None of the studies have tried to construct a composite index of globalization for the Indian economy.
- The majority of studies related to socio-economic development limit themselves to measuring income inequality and poverty in both International and Indian contexts and very few studies have used education and health dimensions.
- No Study is found that seeks to identify the prominent global connections of anti-globalization and geopolitics.

The present study proposes to incorporate several of these under-researched areas of the nature and influence of globalization.

3.2 RESEARCH QUESTIONS

Following the review of the literature and research gap the following research questions warrant investigation:

1. What is the nature of globalization in the Indian economy?
2. What is the depth and breadth of globalization in India?
3. Is there an interconnectedness between different dimensions of globalization?
4. How has globalization impacted economic growth, and socio-economic development of India?
5. Is there any anti-globalization or slow-globalization wave in India?

3.3 OBJECTIVES OF THE STUDY

The present study focuses on the following objectives based on the literature reviewed and the research questions raised.

1. To provide an overview of policies adopted in India toward globalization
2. To examine the extent and nature of globalization in India
3. To examine the inter-association between dimensions of globalization in India
4. To analyze the impact of globalization on economic growth in India
5. To analyze the socio-economic impact of globalization in India

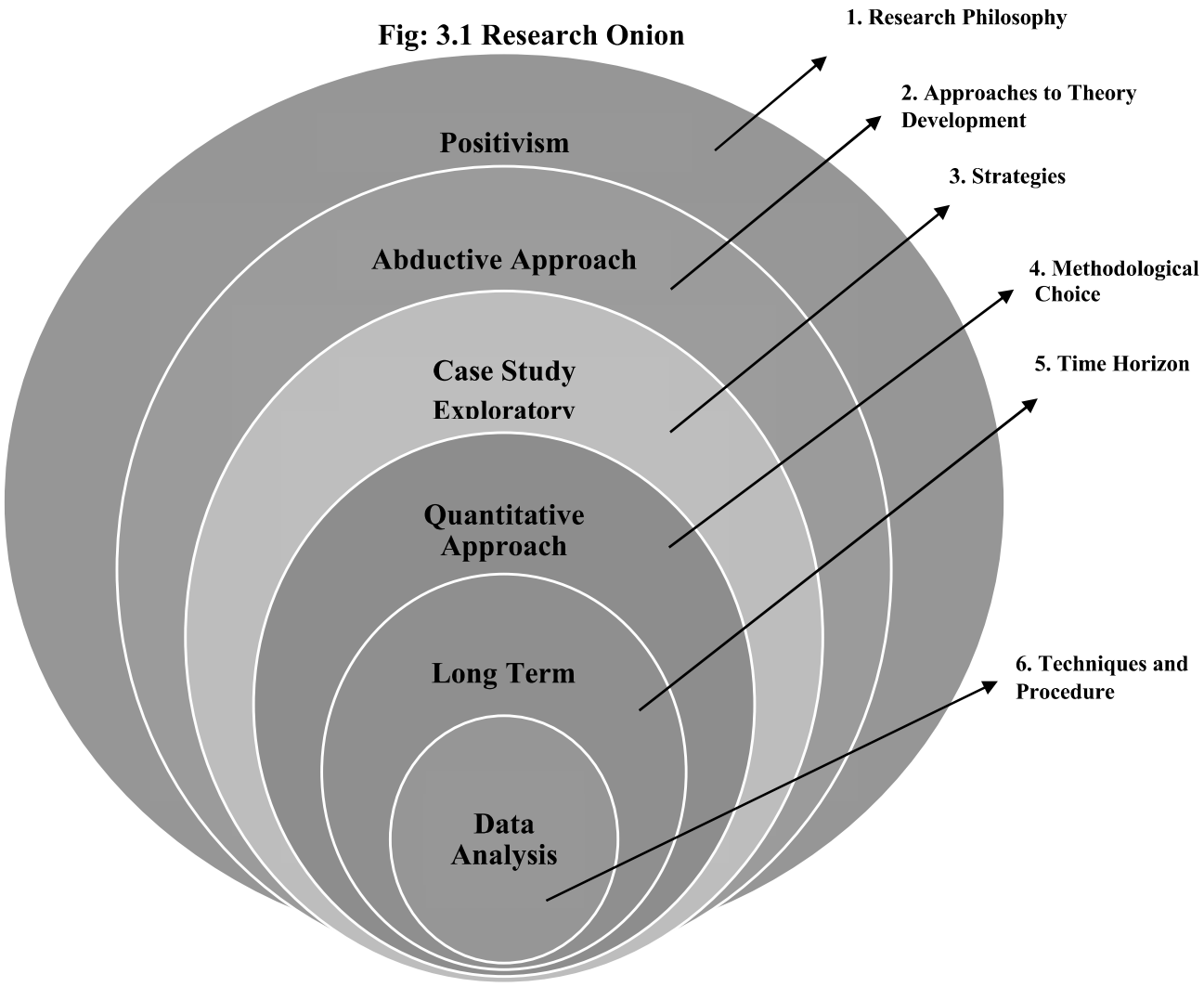
3.4 METHODOLOGY OF THE STUDY

This section discusses the steps undertaken to provide solutions to the research problems. It is a systematic approach used by researchers to analyze research problems. The present study has used a Research Onion to show the research methodology proposed by Saunders et al. (2017). They have explained the research methodology based on the layers of an onion. Each layer of onion provides a stage of research design. Thus, the research onion forms six stages of research methodology namely, research philosophy, approaches to development of theory, research strategy, choice of methodology, time horizons, and finally the techniques and procedures. The Research Onion is presented in Fig. 3.1.

Layer 1: Research Philosophy

The first layer of the research onion is research philosophy. It gives the foundation of any study as it describes the set of beliefs on which research is based. Research philosophy can be described from either ontology or epistemology. There are two main research philosophies based on ontology and epistemology namely, positivism and interpretivism as proposed by Saunders et al. (2016). Bhaskar (2008) proposed a theory of critical realism that combines both positivism and interpretivism. The present study is based on positivism as all dimensions of globalization and their indicators are based on empirical data sourced from official sources.

Fig: 3.1 Research Onion



Source: Modified Research Onion Framework Based on Saunders et al. Research Onion Cited in Shikha, 2022

Layer 2: Approaches to Theory Development

Three approaches to theory development are suggested by Saunders et al. (2016) namely, inductive, deductive, and abductive. Inductive and deductive approaches to theory building are widely used approaches. The inductive and deductive approaches are based on past probabilities. The abductive approach involves making inferences about the most plausible explanation for the relationships established. The present study is based on abductive reasoning. Models of economic growth and socio-economic development have been hypothesized using abductive reasoning in the study.

Layer 3: Research Strategy

This layer of research onion aims to select the stratergy to find out the solutions related to research problems. The present study uses descriptive, exploratory, and case-study approaches to research design. This research work is a case study of the Indian economy with reference to the impact of globalization on its economic growth and socio-economic development.

Layer 4: Methodological Choice

There are three data collection techniques available namely, mono-method, mixed-methods, and multiple-methods. The present study uses a mono method which is entirely based on the quantitative approach of data collection The secondary data related to economic and financial globalization is sourced from the Handbook of Statistics on Indian Economy and RBI Bulletin published by the RBI and Economic Survey of various years, World Bank Database and the website of Ministry of Commerce. The data related to political and technological globalization is sourced from the World Bank Database, the database package of Statista, Handbook of Statistics on Indian Economy and RBI Bulletin, website of United Nations (UN) peacemaking missions, and the website of the Ministry of Commerce and Industry. The data related to indicators of social globalization is sourced from All India Survey on Higher Education (AISHE) Reports, Education Statistics Reports of the Ministry of HRD and Ministry of Education, annual reports of the University Grant Commission (UGC), annual reports of the Tourism, and Handbook of Statistics on Indian Economy and RBI Bulletin**.**

Layer 5: Time Horizons

Saunders et al. (2011) have suggested two types of time horizons: cross-sectional and longitudinal studies, whereas Kosow and Gabner (2008) had suggested three-time horizons namely, short term, medium term, and long term. The short term is a period that implies the study is up to ten years, medium-term study is up to 25 years and the long term study is more than 25 years. The present study is based on time series data on a wide range of globalization variables related to each dimension namely, economic, financial, political, technological, and social. The time period of the study is long term time horizon i.e. reform period of Liberalization, Privatization and Globalization (LPG) from 1990-91 to 2020-21. Some of the analysis is limited up to 2019-20 as per availability of data.

Layer 6: Techniques and Procedures

The final layer related to research onion is the techniques and procedures undertaken. The study is based on secondary data from reliable sources. The present study is descriptive and empirical in nature which starts with a thematic review of literature based on dimensions of globalization. Simple statistical techniques like graphical presentations, tables, ratios, and growth rates have been used to analyze the trend and flow in each indicator of globalization. The dimensional indices of globalization have been constructed using the Principal Component Analysis (PCA) method proposed by Dreher (2006). Further, all dimensions of globalization have been brought together to construct the composite index of globalization using PCA. The inter-linkages between all dimensional indices of globalization have been examined using the Spearman Rank Correlation technique. The present study also analyzes the impact of globalization on economic growth using the Granger Causality and Ordinary Least Square (OLS) techniques. The last part of the study includes analytical work to know the impact of globalization on the socio-economic development of India. The entire econometric analysis carried out in the study is based on the statistical softwares EViews, SPSS, InfraNodus and Excel.

3.5 METHOD TO CONSTRUCT INDEX OF GLOBALIZATION

In the present study six different globalization indices have been constructed in which five are the dimensional indices and one is a composite index. The indices have been

constructed using the method of KOF globalization index developed by Dreher (2006) which involves the use of PCA. However, the present study extends the globalization index by constructing five dimensional indices for economic, financial, political, technological, and social globalization as well as a composite index of globalization. Construction of the index involves five steps:

Step 1: Index Composition

The globalization index is based on a multidimensional approach using 31 variables that measure various aspects of globalization in India. The index is based on five dimensions: economic globalization, financial globalization, political globalization, technological globalization, and social globalization. Table 3.1 represents the different indicators used to construct each dimensional index of globalization.

Table 3.1: Dimensions and Indicators of Globalization

Dimensions	Indicators
Economic Globalization	Exports of Goods to GDP
	Imports of Goods to GDP
	Trade in Goods to GDP
	Exports of Services to GDP
	Imports of Services to GDP
	Trade in Services to GDP
	Custom and Other Import Duties to Imports
	Import Penetration
	Revealed Comparative Advantage of India in Services Exports
	India's Trade to World Trade
Financial Globalization	FDI to GDP
	FII to GDP
	FDI+FII to GDP
	Sectoral Foreign Direct Investments (FDI)
	Foreign Direct Investment to Gross Fixed Capital Formation Ratio

	External Debt to GDP
	Foreign Exchange Reserves to Imports Ratio
Political Globalization	Participation in Trade Agreements
	Trade with Trade-Agreement Countries to India's Total Trade
	India's Membership in Foreign Organizations
	India's Membership in Peace-Making Agreements
Technological Globalization	Mobile Cellular Subscription Per 100 Persons
	Global Commodities as a Percentage of the Population
	Research and Development Expenditure to GDP
	Patent Application by Non-Residents to the Total Population
Social Globalization	Remittances Inflows to GDP
	Foreign Exchange Earnings from Tourists as a ratio to Foreign Exchange Reserves
	Inbound and Outbound Tourists to the Total Population
	Ratio of Students Going Abroad to Enrolment in Higher Secondary (HSC)
	Work Permit Abroad as a Ratio to Total Population
	Ratio of Students Coming to India to Enrolment in Higher Education (HE)

Source: Author's Compilation

Step 2: Normalizing the Data

The indicators are used to convey different information and have different units and scales so they cannot form a composite index directly. To combine the data in a meaningful way normalization is done. Normalizing the data means the data is transformed into an index with a scale from zero to one hundred. Normalization can be done using z-score, min-max, re-scaling, etc. In this study, the data was processed first using the normalized min-max method. This is shown using the formula (1).

$$Z_i = \frac{X_i - min\,(x)}{max(x) - min\,(x)} \times 100 \ldots\ldots\ldots\ldots \textbf{(1)}$$

$where,$

$Z_i = i^{th}\ normalized\ value\ in\ the\ data\ set$

$X_i = i^{th}\ value\ in\ the\ data\ set$

$min\ (x)\ = minimum\ value\ in\ the\ data\ set$

$max\ (x)\ = maximum\ value\ in\ the\ data\ set$

Normalization will convert the data values from zero to 100, such that $0 \leq Z_i > 100$ where 100 represents the highest value across the years and zero represents the worst situation. The year in which the variable has the minimum value will have zero as the index value and the year in which the variable has the maximum value will have 100 as the index value. The initial index obtained in this manner is dynamic as the year in which the minimum and maximum values are observed can change according to the indicators being examined. This step is applied to each indicator.

Step 3: Assigning the Weights

The next step is to assign weights to the indicators of each dimension. This will allow the significance or importance of each indicator of the dimension to be adjusted. The criteria for assigning the weights may be based on a subjective method, where the researcher assigns the weight based on their own belief of the important of the indicators. This method was used in A T Kearney Globalization Index. Other methods involve statistically obtained weights using the Principal Component Analysis (PCA)/Factor Analysis, Data Envelopment Analysis (DEA), Regression Analysis, etc. In this study, PCA has been used to avoid subjective bias.

The PCA is a dimensionality reduction method, which dimensionally reduces the information of large dataset to smaller one. It is applied to the variables which are in their standard form. Therefore, in order to construct the dimensional index, all variables of the dimension are firstly normalized to get their values between zero and 100.

Step 4: Aggregation of Indicators

Once the weights are obtained, the dimensional globalization Index can be calculated as a weighted average of all the indicators. The raw values of the indicators are multiplied by

their respective weights and then aggregated. This weighted aggregate is then divided by the total weights to obtain the weighted mean of the dimensional index viz, Economic Globalization Index, Financial Globalization Index, Political Globalization Index, Technological Globalization Index, and Social Globalization Index. The formula used for weighted mean is as under:

$$\text{Dimensional Index} = \frac{\sum x_i \times w_i}{\sum w_i} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(2)}$$

$where,$

$x_i = raw\ value\ of\ the\ indicator$

$w_i = weight\ of\ the\ indicator$

Step 5: Normalizing the Dimensional Index

The last step is to normalize the weighted mean by the following the min-max method of normalization. Therefore, the final dimensional index values will again be interpreted from zero to 100, where zero implies lowest level of globalization and 100 implies the highest degree of globalization within the given time-series.

These steps have been repeated for each of the five dimensions of globalization to obtain the economic, financial, political, technological and social globalization indices.

Composite Index of Globalization

The present study has constructed five different globalization indices which gives an overview of the nature and extent of globalization in India. The composite index based on the dimensional indices gives an idea of the overall globalization of the Indian economy. The composite index of globalization (CGI) has been constructed following all the five steps described in this section with the only difference that in this case the dimensional indices are treated as the variables.

3.6 TECHNIQUE OF ANALYZING INTER- RELATIONSHIP BETWEEN DIMENSIONS OF GLOBALIZATION

The present study also examines the inter-relation between the dimensions of globalization by using pair-wise correlation between them. The non-parametric Spearman rank

correlation has been used in this case as the data does not follow the assumptions of the Pearson Product Moment Correlation Coefficient (PMCC) test of correlation. The correlation coefficients have been tested for statistical significance. The hypotheses tested are that there exists a positive association between each pair of dimensional indices of globalization.

3.7 EMPIRICAL ANALYSIS OF THE RELATION BETWEEN GLOBALIZATION AND ECONOMIC GROWTH

This section deals with the techniques used for examining the relationship between globalization and economic growth. Two approaches have been used: in the first approach, causal relation between globalization and economic growth has been studied using Granger Causality test on EViews. Globalization has been alternatively examined in terms of individual indicators, dimensional indices of globalization and composite index of globalization. Economic growth has been represented by GDP at constant price. The second approach involves using the variables identified from the results of the Granger causality test to construct models of economic growth for regression analysis. Before running the Granger causality test, it is important to check for cointegration and stationarity of data. If the time series has a unit root the Johansen cointegration test is applied to the non-stationary series to check for long run relationship between economic growth and globalization.

Once the long run relationship has been established the time series is required to be made stationary before applying the Granger causality test. The Augmented Dickey Fuller (ADF) test has been used to make the data stationary so that it can be fit for the model. The data having unit root were transformed to the first and second differences as applicable. Combining the Granger causality and Johansen Cointegration test would help in establishing whether there exists a long run, uni-directional or bi-directional relationship.

The second approach, to analyze the relation between economic growth and globalization is examined by estimating models using the Ordinary Least Square (OLS) technique. It is hypothesized that globalization has a positive effect on economic growth. The dependent and the independent variables that are being used have been transformed to either log or

made stationary at level I(0) and first difference I(1) using the Augmented Dickey Fuller (ADF) test for unit root. The regression models have been tested for linearity of the variables, and residual diagnostic tests have been conducted for each model to check for normal distribution, homoscedasticity, and the absence of serial correlation and autocorrelation. The diagnostic tests include the Jarque-Bera test of normality, Breusch-Pagan-Godfrey test of homoscedasticity and Breusch-Godfrey serial correlation Lagrange Multiplier (LM) test. The Durbin-Watson test for auto-correlation between the error terms has also been applied.

Two sets of regression models have been tested; one where Total Factor Productivity (TFP) has been used to represent economic growth which is the dependent variable. The set of models is based on GDP at constant prices as the dependent variable. The independent variables include control variables as well as indicators of globalization. The control variables include Gross Fixed Capital Formation (GFCF), Gross Enrolment Ratio (GER) of higher education, Elementary GER (E_GER), Secondary GER (S_GER), Higher Secondary GER (HS_GER), Working Age Population as a percentage of population (WAP), and Human Capital Per Person (HCPP). The regression models have been estimated using the EViews software. The hypotheses addressed in the study are as follows:

3.8 METHODOLOGY FOR ANALYSIS OF THE IMPACT OF GLOBALIZATION ON SOCIO-ECONOMIC DEVELOPMENT

The analysis of the impact of globalization on socio-economic development is gauged through statistical estimation, incorporating its various indicators. Different indicators of socio-economic development across the dimensions of income equality, gender equality, health and education have been examined for their trends. For the empirical analysis of the impact of globalization on socio-economic development, the ARDL approach is used as the data series comprises 30 years from 1991 to 2020 which is sufficient for the analysis. Non-stationarity in the data series occurs due to structural breaks present in the data set. However, for estimating the ARDL models each variable has to be free from non-stationarity. The ARDL model uses the lag values of the variables. The variables used in the model need to be stationary level I(0) or first difference I(1). All endogenous variables related to socio-economic are stationary at their first difference. The exogenous variables

of globalization are stationary at level and first difference based on Augmented Dickey Fuller Test.

The ARDL model is based on the lag values of both exogenous and endogenous variables, and the number of optimal lags is selected based on Akaike Information Criteria (AIC) for each model. The ARDL model is a short-run model but the ARDL bound test is the cointegration test developed by Peraran et al. (2001) to test the presence of the long run relationship. The null hypothesis of the ARDL bound test is that there is no cointegration. The results of the cointegration are based on the upper bound and lower bound values. If the F-statistics is less than lower bound then there is no cointegration between dependent and independent variables in the long run. If the F-statistics is greater than the upper bound then there exists cointegration between dependent and independent variable, but if the F-statistics is between the lower and upper bound then the test is inconclusive. If the ARDL bound test is found to be non-co-integrated and inconclusive then the long-run relationship would not be established and the results will be followed based on the short-run ARDL model.

In the ARDL model, if any of the current or lag period variables do not influence the dependent variable at the accepted percentage level of significance, then the results will be cross checked with the Wald test, as it figures out whether the variable in a specific lag is fit to use in the analysis. If the Wald test F-statistics is less than the 0.05 level of significance for all lag values, then all the lags would be statistically significant in explaining the dependent variable. The results of the ARDL are based on the fulfillment of assumptions of regression. The models assumed that there should be linearity between dependent and independent variables, normal distribution, homoscedasticity, and it should be free from autocorrelation. If the models do not meet these assumptions, then it may lead to spurious results. Residual diagnostic tests are conducted for each model to satisfy these assumptions. The diagnostic tests include the Jarque-Bera test of normality, Breusch-Pagan-Godfrey test of homoscedasticity and Breusch-Godfrey serial correlation Lagrange Multiplier (LM) test. The null hypotheses of the diagnostic tests are stated in terms of the presence of normality and homoscedasticity, and the absence of serial correlation. Each model's null hypothesis is rejected at significant p-values.

The variables used in the analysis of socio-economic development models are the Human Development Index (HDI), Gender Inequality Index (GII), Government Spending on Education to GDP (GE_GDP), GINI Index, and Employment to Total Population (Emp_TP). Since education represented by GER at elementary, secondary, and higher secondary were not fit for use in the ARDL models as they did not satisfy the required condition of stationarity, government expenditure on education as a ratio to GDP has been used. The ARDL models have been estimated using EViews software. The hypotheses addressed in this section are that globalization has a positive impact on education, gender equality, income equality and employment

3.9 METHODOLOGY FOR ANALYSIS OF ANTI-GLOBALIZATION MOVEMENT

The present study enquires about the nature of anti-globalization using the pieces of evidence from newspapers and research papers, and generates insight into anti-globalization movements in the global economy using the Text Network Analysis (TNA) which is run on InfraNodus, a web based open source tool. The TNA is a network analysis representing a text as a network graph. It uses words as nodes and the occurrence of nodes in texts builds up the relation. Once the text is encoded as a network graph, the most influential keywords are identified and a relationship is built between them. There are multiple network-based tools available such as Python, R program, Gephi, etc. The present study uses TNA on InfraNodus (Paranyushkin, 2019), a web-based open-source tool.

Paranyushkin (2019) identifies certain steps for constructing a network graph. Firstly, text normalization is done to reduce redundancy and to keep the morphology by bringing different variations in the same word. Secondly, the "*stop words*" such as is, are, the, etc., which do not carry any additional meaning are removed. Thirdly, the text is then converted to a network graph in which the normalized text are the nodes and their co-occurrences in the graph are the edges. The next step includes applying a ranking algorithm, in which the nodes with the highest betweenness centrality are the most appearing nodes in the network. They are shown bigger in the network graph formed. The next step includes applying a community detection algorithm based on modularity. This algorithm detects the nodes most densely connected with the rest of the network. The Force Atlas algorithm is applied

to align the deeply connected nodes to construct the topical cluster. The last step is to identify the structure of discourse based on the network graph. The InfraNodus identifies the structure of the discourse using the network graph. The discourse is measured using three criteria; modularity (M), connected component (C), and Shannon entropy (E). Based on these criteria, four scores namely, dispersed, diversified, focused, and biased are given to measure the level of bias in the discourse in descending order.

3.10 LIMITATIONS OF THE STUDY

Though diligent efforts have been undertaken for the present study, some limitations are inevitable. The study is based on indicators of different dimensions. The scope of the present study includes five dimensions namely, economic, financial, political, technological and social. However, globalization is a complex phenomenon with many more dimensions and spillover effects on several aspects of an economy such as culture, ideology, religion, legal, institutions, and environment, etc., which are difficult to capture in quantitative terms. Therefore, the results of the present study need to be interpreted within the scope of the five dimensions included in the research work.

With reference to the political dimension of globalization, the analysis excludes many other indicators such as, the number of foreign embassies in India, and Indian embassies in foreign countries in absolute numbers, international flight destinations in absolute numbers, etc. due to insufficient data for the entire period of study. Likewise, technological globalization has been measured using global commodities to the total population, patent applications by non-residents to the total population, mobile cellular subscription to the total population, and R&D expenditure to GDP. However, the number of global commodity outreach in India is limited, and the availability of data on the number of outlets of the available global commodities is also limited. The present study has used data limited to McDonald's and Ikea stores. There are many other global commodities also but, the availability of data in the study period is not available.

Apart from the indicators used for the social dimension of globalization in the study, there are many other aspects to it such as the proportion of foreign languages including English speaking population, import, and export of all kinds of media production, number of

international academic research output, etc. which are not within the scope of the present study.

With regard to the socio-economic development of a country, reduction in poverty is one of the major indicators. However, as continuous data for all the years of the study period was not available the study has attempted to capture the socio-economic development of India based on related variables such as unemployment and income inequality. The multidimensional poverty index also has missing series in the study period, which could not be extracted by interpolation on account of the large gap in data.

Lastly, the present study is based on the 1991-2020 time frame, where the outbreak of Covid-19 had already taken place since November 2019 in China. Globalization led to the spread of Covid-19 across the world. In response to the pandemic, the governments of the affected countries undertook many restrictive measures on account of which data for some of the indicators for the years 2019 and 2020 was not available. Also, most of the indicators show erratic behaviour at the end of the study period on account of the impact of Covid-19 which has influenced the overall trend of globalization in different dimensions.

Despite these limitations, the present study has attempted to undertake a robust analysis based on the availability of data. The analyses have been carried out at different levels. At the primary level, the analyses involve an examination of the trends of each indicator. The secondary level analyses include the construction of indices of globalization and their inter-connectedness. At the tertiary level, the analyses relate to the impact of globalization on economic growth and socio-economic development. The analysis has been carried out using advanced econometric techniques. Thus, the study lays a strong foundation for understanding the impact of globalization on a developing economy.