CHAPTER 5

ECONOMETRIC ANALYSIS OF THE IMPACT OF GLOBALIZATION ON THE INDIAN ECONOMY

The in-depth analysis of the nature and extent of globalization of the Indian economy in all its dimensions has brought to light interesting findings. Most indicators of globalization have shown remarkable growth and the dimensional indices of globalization exhibit a high degree of interconnectedness for the Indian economy. The composite index of globalization of India also shows robust growth. These findings would be more meaningful if their implications for the Indian economy were studied, both in terms of their impact on India's economic growth as well as its socio-economic development. With this rationale, the present chapter undertakes an empirical analysis of the linkages between globalization and growth and development of India.

The theoretical and empirical models of economic growth were first given by the classical economists. But the incorporation of globalization into economic growth studies began with the examination of the linkages between the trade channel of globalization and growth, and are found in Baba (1956), Kindleberger (1956), Das (1966), Hagen and Hawrylyshyn (1969). In the 1970s and 80s, some other studies such as Williamson (1978), Cardoso and Faletto (1979), Stokes and Jaffee (1982), and Jaffee (1985) also professed an outward-oriented approach and believed that exports increase economic growth. Simultaneously, growth models focused on the channel of capital flows were also propounded. These are found in Papanek (1973), Chase-Dunn (1975), Bornschier, Chase-Dunn and Rubinson (1978), London (1987), London and Smith (1988), London and Williams (1988), London and Robinson (1989), Boswell and Dixon (1990), Wimberley (1990), Zeinelabdin (1998), and Dabour (2000). All studies report a positive impact of foreign capital flows in the host countries.

Recent studies have incorporated several alternative models and tests to examine the linkage between globalization and economic growth. Some of these studies are Dreher (2006), Barry (2010), Ray (2012), Meraj (2013), Maqbool-ur-Rahman (2015), Antiquisa and Deluna (2014), Kilic (2015), Sehrawat and Giri (2016), and Hasan (2019). These

studies have tested models of economic growth with limited representation of globalization by either using ratios of foreign trade to GDP and FDI to GDP. A few studies have used the sophisticated KOF globalization index in the growth models in country-comparison studies. Studies on globalization and its linkages with socio-economic impact are found since the 1970s, incorporating trade, FDI, and economic growth and inequality. This is found in Papanek (1973), Chase-Dunn (1975), and Bornschier, Chase-Dunn and Rubinson (1978). Most of the studies reviewed from the literature have used a limited number of indicators, such as, HDI, poverty and inequality to measure socio-economic development. Important indicators such as education, employment, gender equality, etc., are not found to be used, particularly, in the context of India.

Based on this gap, this chapter deals with the econometric analysis of the impact of globalization on the Indian economy with the coverage of a wider range of indicators, and dimensional and composite indices of globalization, in the analysis. The analyses in this chapter are organized into five sections. The first section presents the findings of the Granger causality test between the indicators of globalization and economic growth. The second section analyzes the Granger causality between the indices of globalization and economic growth. Based on the findings of the first two sets of analyses, the third section proceeds with analyzing the impact of globalization on economic growth using the Ordinary Least Squares (OLS) technique. The fourth section shows the analysis of the impact of globalization on the socio-economic development of India using the Autoregressive Distributive Lag (ARDL) method. The last section establishes the linkages of globalization and economic growth and development and ends with a discussion on the anti-globalization movement across the world in recent times.

5.1 CAUSALITY BETWEEN INDICATORS OF GLOBALIZATION AND ECONOMIC GROWTH

The Granger causality method is used for determining whether a time series is significant in forecasting another time series. In the present context, the two-way Granger causality test helps in determining whether it is globalization that helps accelerate economic growth or the other way round. Here, economic growth has been measured in terms of GDP at constant prices. All indicators of globalization, 31 in total, have been used to represent

globalization. The period of analysis is 1990-91 to 2019-20. In dealing with time series data a number of econometric issues arise, which need to be resolved. As the use of the Granger causality test involves time series data, prior to using the test it is important to apply the tests of cointegration and stationarity of data. Toda and Phillips (1993) have shown that ignoring co-integration may lead to spurious models.

The co-integration test is an econometric test which is a precondition for testing the existence of long run relations between two or more variables that have unit root. The Johansen cointegration test (Johansen 1991) is used for establishing a long run relationship between indicators of globalization and economic growth. The existence of cointegration implies that there exists a uni-directional or bi-directional causality between the time series. The null hypothesis of cointegration test is stated as the absence of cointegration which can be rejected only against the valid proof of data.

Non-stationary indicators have multi-collinearity which would create an error of the near singular matrix in EViews, if used simultaneously. Therefore, the co-integration of 31 indicators of globalization and economic growth has been gauged with different sets of equations using different combinations of independent variables with the dependent variable, economic growth. The null hypothesis with reference to co-integration can be rejected using two approaches, viz., trace statistics and maximum Eigenvalues. The null hypothesis of 'no cointegration' can be rejected while using the trace statistics, if the trace statistics of the variable are greater than the 0.05 critical value. In the case where maximum Eigenvalues are being used, the null hypothesis can be rejected if the maximum Eigenvalues are greater than the 0.05 critical values. The results of the cointegration test using both the criteria are presented in Tables 5.1 and 5.2, respectively.

Table 5.1 Cointegration between Economic Growth and Globalization using Trace Statistics

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
GDP; Export of Services to GDP; FDI+FII to GDP; Export to GDP; FDI to GDP; FDI Inflows to GFCF				
None *	0.974191	246.5737	95.75366	0
At most 1 *	0.905055	144.1765	69.81889	0
At most 2 *	0.764385	78.2516	47.85613	0

At most 3 *	0.548296	37.77599	29.79707	0.0049
At most 4 *	0.420098	15.5236	15.49471	0.0495
At most 5	0.009473	0.26651	3.841465	0.6057

**GDP; FII to GDP; Foreign Debt to GDP; Foreign Exchange Reserve to Imports;
Foreign Exchange Earnings from Tourists to Foreign Exchange Reserve;
Global Commodities as a Percentage of Population**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.929561	188.079	95.75366	0
At most 1 *	0.786175	113.7948	69.81889	0
At most 2 *	0.603677	70.60213	47.85613	0.0001
At most 3 *	0.578447	44.68738	29.79707	0.0005
At most 4 *	0.372827	20.50068	15.49471	0.0081
At most 5 *	0.23328	7.437751	3.841465	0.0064

**GDP; Import Duties to Imports; Import Penetration; Import of Services to GDP;
Import to GDP; Inbound and Outbound Tourism to Total Population;
India's Trade to World Trade; Membership in Foreign Organization**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.991074	423.5917	159.5297	0
At most 1 *	0.985305	300.9034	125.6154	0
At most 2 *	0.894453	191.1772	95.75366	0
At most 3 *	0.8784	132.7135	69.81889	0
At most 4 *	0.861379	77.93096	47.85613	0
At most 5	0.488648	26.55467	29.79707	0.113
At most 6	0.27671	9.116545	15.49471	0.3547
At most 7	0.026338	0.693965	3.841465	0.4048

**GDP; Students Going Abroad to Enrolment in HSC; Mobile Subscription Per 100 Person;
Participation in Trade Agreements; Participation in UN Peace Making Agreements;
Patent Applications by Non-Resident to Total Population; R&D Expenditure to GDP;
Remittances Inflows to GDP**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.995694	409.5497	159.5297	0
At most 1 *	0.969616	267.9112	125.6154	0
At most 2 *	0.895375	177.0712	95.75366	0
At most 3 *	0.837582	118.3795	69.81889	0
At most 4 *	0.691379	71.12228	47.85613	0.0001
At most 5 *	0.650301	40.55558	29.79707	0.002
At most 6	0.391367	13.23782	15.49471	0.1064
At most 7	0.012527	0.327768	3.841465	0.567

**GDP; Revealed Comparative Advantage of Services; Sectoral FDI; Students Coming to India to
Enrolment in Higher Education; Trade to GDP; Trade in Services to GDP;
Trade with Trade Agreement Member Countries; Work Permits Abroad to Total Population**

Hypothesized	Eigenvalue	Trace	0.05	Prob.**

No. of CE(s)		Statistic	Critical Value	
None *	0.991129	341.2338	159.5297	0
At most 1 *	0.895332	213.66	125.6154	0
At most 2 *	0.889975	152.7219	95.75366	0
At most 3 *	0.701103	93.13157	69.81889	0.0002
At most 4 *	0.676755	60.52489	47.85613	0.0021
At most 5 *	0.452254	30.03259	29.79707	0.047
At most 6	0.395556	13.78009	15.49471	0.0892
At most 7	0.006904	0.187044	3.841465	0.6654

* Significant at 1% level; ** Significant at 5% level
Source: Computation using EViews

In the first set of equations, the long run relation between globalization and economic growth has been checked with reference to six variables as mentioned in the Table 5.1. Five co-integration equations have trace statistics greater than the critical values. The result is found to be significant at 0.01 and 0.05 levels. The second set of equations deals with seven variables of which at most six co-integrating equations are found to be significant at one percent. The third set of equations includes eight variables. It has at most 5 co-integrating equations. The fourth set of equations includes eight other variables. Five, at the most, are found to be co-integrating equations in which the trace statistics is greater than the critical values. In the last set of equations comprising eight variables, six equations co-integrate, having trace statistics greater than critical value. Thus, the indicators of globalization are found to have a long run relationship with economic growth, as most of the equations have the trace statistics greater than the critical values. This reveals that the time series of globalization and economic growth is fit for establishing long-run relationships.

Table 5.2 Cointegration between Economic Growth and Globalization using Maximum Eigenvalues

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
GDP; Export of Services to GDP; FDI+FII to GDP; Export to GDP; FDI to GDP; FDI Inflows to GFCF				
None *	0.974191	102.3973	40.07757	0
At most 1 *	0.905055	65.92486	33.87687	0
At most 2 *	0.764385	40.47561	27.58434	0.0007
At most 3 *	0.548296	22.25238	21.13162	0.0347
At most 4 *	0.420098	15.25709	14.2646	0.0347
At most 5	0.009473	0.26651	3.841465	0.6057

GDP; FII to GDP; Foreign Debt to GDP; Foreign Exchange Reserve to Imports; Foreign Exchange Earnings from Tourists to Foreign Exchange Reserve; Global Commodities as a Percentage of Population				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.929561	74.28423	40.07757	0
At most 1 *	0.786175	43.19268	33.87687	0.0029
At most 2	0.603677	25.91474	27.58434	0.0805
At most 3 *	0.578447	24.18671	21.13162	0.018
At most 4	0.372827	13.06293	14.2646	0.0767
At most 5 *	0.23328	7.437751	3.841465	0.0064
GDP; Import Duties to Imports; Import Penetration; Import of Services to GDP; Import to GDP; Inbound and Outbound Tourism to Total Population; India's Trade to World Trade; Membership in Foreign Organization				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.991074	122.6883	52.36261	0
At most 1 *	0.985305	109.7262	46.23142	0
At most 2 *	0.894453	58.46364	40.07757	0.0002
At most 3 *	0.8784	54.78257	33.87687	0.0001
At most 4 *	0.861379	51.37629	27.58434	0
At most 5	0.488648	17.43812	21.13162	0.1523
At most 6	0.27671	8.42258	14.2646	0.3374
At most 7	0.026338	0.693965	3.841465	0.4048
GDP; Students Going Abroad to Enrolment in HSC; Mobile Subscription Per 100 Person; Participation in Trade Agreements; Participation in UN Peace Making Agreements; Patent Applications by Non-Resident to Total Population; R&D Expenditure to GDP; Remittances Inflows to GDP				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.995694	141.6385	52.36261	0
At most 1 *	0.969616	90.84002	46.23142	0
At most 2 *	0.895375	58.69173	40.07757	0.0002
At most 3 *	0.837582	47.25717	33.87687	0.0007
At most 4 *	0.691379	30.56671	27.58434	0.0201
At most 5 *	0.650301	27.31776	21.13162	0.0059
At most 6	0.391367	12.91005	14.2646	0.0809
At most 7	0.012527	0.327768	3.841465	0.567
GDP; Revealed Comparative Advantage of Services; Sectoral FDI; Students Coming to India to Enrolment in Higher Education; Trade to GDP; Trade in Services to GDP; Trade with Trade Agreement Member Countries; Work Permits Abroad to Total Population				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.991129	127.5738	52.36261	0
At most 1 *	0.895332	60.93807	46.23142	0.0007

At most 2 *	0.889975	59.59037	40.07757	0.0001
At most 3	0.701103	32.60668	33.87687	0.0703
At most 4 *	0.676755	30.4923	27.58434	0.0206
At most 5	0.452254	16.2525	21.13162	0.2105
At most 6	0.395556	13.59305	14.2646	0.0636
At most 7	0.006904	0.187044	3.841465	0.6654

* Significant at 1% level; ** Significant at 5% level
Source: Computation using EViews

Table 5.2 presents the results of the cointegration test for the series of economic growth and globalization based on the decision criteria of maximum Eigenvalue. The co-integration test for the 31 indicators of globalization with economic growth has been separated out into different sets of equations, as taking all the indicators together creates the problem of a high degree of multi-collinearity.

The results with reference to the first set of equations reveals that five cointegration equations have maximum Eigenvalues greater than the critical values. The second set of equations tests for cointegration for another set of indicators of globalization as listed in the Table 5.2. It is found that there are at most six co-integrating equations, significant at 0.01 level. Likewise, the third and the fourth set of equations, which includes seven different indicators of globalization, have at most five co-integrating equations. The last model has at most six co-integrating equations. Thus, all the indicators of globalization are found to have a long run relationship with economic growth as all variables have the maximum Eigenvalues greater than the critical values. This reveals that the time series of globalization and economic growth is fit for establishing long-run relationships.

As stated earlier, before using the Granger causality test for testing the causality between globalization and economic growth it is necessary to satisfy the required condition that the times series are stationary. For this purpose, the Augmented Dickey Fuller (ADF) test has been used. The null hypothesis of ADF is that there is a unit root in the time series, and it can be rejected only where there is a valid proof against it. The series that is found to have a unit root, is then transformed to the first or second difference, as required, and tested for stationarity after the transformation. Accordingly, the indicators of globalization have been transformed to first and second differences and the GDP at constant price is stationary at level.

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Causality between Globalization and Economic Growth:

Two-way Causality:

The results of the Granger causality test are presented in Table 5.3. It is found that there is a two-way causality between some pairs of variables. These are, GDP with imports of goods to GDP, trade in goods to GDP ratio, import penetration, and foreign debt to GDP ratio. In other words, these four indicators of globalization accelerate economic growth, and economic growth also accelerates globalization when represented by these four indicators.

Table 5.3 Granger Causality between Indicators of Globalization and Economic Growth

Granger Causality Test	F-Statistic	Prob.
Two-way Causality between Globalization and Economic Growth		
Imports of Goods to GDP Granger Cause GDP	5.22209*	0.0135
GDP Granger Causes Imports of Goods to GDP	3.94339**	0.0337
Import Penetration Granger Causes GDP	3.18075***	0.0603
GDP Granger Causes Import Penetration	3.22957**	0.0581
Trade in Goods to GDP Granger Causes GDP	5.22963*	0.0134
GDP Granger Causes Trade in Goods to GDP	2.57202***	0.0982
Foreign Debt to GDP Granger Causes GDP	2.64102***	0.0928
GDP Granger Causes Foreign Debt to GDP	4.25052**	0.0269
One-way Causality: Globalization to Economic Growth		
Exports of Goods to GDP Granger Cause GDP	5.07440*	0.0149
Foreign Exchange Reserves to Imports Granger Cause GDP	2.90993***	0.0747
Number of Sector with 100 percent FDI Permits Granger Causes GDP	3.80371**	0.0374
Membership in Foreign Organization Granger Causes GDP	2.81817***	0.0804
Remittances to GDP Granger Cause GDP	3.43320**	0.0496
Work Permits Abroad to Total Population Granger Causes GDP	3.56763**	0.0455
One-way Causality: Economic Growth to Globalization		
GDP Granger Causes FDI+FII to GDP	8.42097*	0.0018
GDP Granger Causes FDI to GDP	8.51742*	0.0017
GDP Granger Causes FDI Inflows to GFCF	5.23174*	0.0134
GDP Granger Causes Foreign Exchange Earnings from Tourists to Foreign Exchange Reserves	4.62565**	0.0205

GDP Granger Causes Foreign Students coming to India to Enrolment in Higher Education	3.06194***	0.0662
GDP Granger Causes Inbound and Outbound Tourist to Total Population	4.36395**	0.0247
GDP does not Granger Causes Students going Abroad to Enrolment in HSC	2.79348***	0.0820
GDP Granger Causes Global Commodity as a percentage of Total Population	5.48769*	0.0113
GDP Granger Causes Patent Applications by Non-Residents to Total Population	5.18338*	0.0139

*Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
Source: Computation using EViews

The findings are as expected because they imply that as the ratio of trade to real economy increases, it will enhance economic growth because India heavily depends on imports of productive inputs for its industries (Topalova and Khandelwal 2011, Rijesh 2015, and Rijesh, 2021). The economic growth resulting from increased productive inputs would further give an impetus for imports to increase as the capacity of the country to pay for imports increases. Increased level of India's foreign trade is also expected to increase its GDP as exports determine the earning capacity while the imports are essential for the domestic industrial sector of India, leading to greater productive capacity as measured by GDP.

As the proportion of imports vis-à-vis the domestic demand components increases, it tends to give a momentum to GDP. Likewise, increase in GDP enhances purchasing power, enabling more imports. In the major part of the first half of the study period, the ratio of external debt to GDP has hovered at ten percent, meaning that there has been relatively equal paced growth in the two variables. In the second half of the study period, the external debt ratio has risen consistently, reaching a level three times higher, that is, at 30 percent at the end of the study period. This phenomenon also converges with the findings that in the latter half of the study period, the gap between imports and exports of goods have increased, leading to an increase in trade deficit. Increased trade in goods in turn has accelerated GDP. Similarly, higher levels of real GDP enhance the country's ability to bear external debt. Although quantifying this circular chain of effects is not within the scope of the present study, it may be modestly claimed that this chain of effects provides justification for the two-way causality between external debt ratio and GDP.

One-way Causality: Globalization to Economic Growth

Uni-directional causality implies that it is either globalization that Granger causes economic growth or it is economic growth that Granger causes globalization, but not both. The findings of the test reveal that the one-way causality runs from some indicators of globalization to economic growth. These are, ratios of exports of goods to GDP and foreign exchange reserves to imports, number of sectors with 100 percent FDI permit, membership to foreign organizations, ratio of remittances to GDP, and work permits abroad to total population. These indicators of globalization in India are found to have positive effect on GDP. Al-Mamun and Nath (2005), Anderson (2007), Palley (2002), Maneschiold (2008), and Hossain et al. (2009) also found similar results for the exports to GDP in the context of different countries. It is well established in literature that as foreign trade increases and as more and more sectors are opened to liberal FDI norms, it would accelerate economic growth (Dreher, 2006; Ray, 2012). As foreign exchange reserves increase, it raises the capacity of the country to import. Membership to regional and multilateral international organizations also increases the prospects for growth as the country's concerns get a platform for being placed and discussed and common economic interests of the member countries are more likely to prevail. Likewise, as more Indians get work permits abroad, the remittances to India would increase and positively influence several factors that make for higher economic growth.

One-way Causality: Economic Growth to Globalization

The one-way causality running from economic growth to globalization is found in the case of several indicators of globalization. Economic growth is found to Granger cause FDI plus FII to GDP ratio, FDI inflows to GFCF ratio, foreign exchange earnings from tourism to foreign exchange reserves ratio, foreign students coming to India as a ratio to enrolment in higher education in India, inbound and outbound tourists to the total population, ratio of students going abroad to enrolment in HSC in India, global commodities as a percentage of population, and patent applications by non-residents to total population. The results are plausible because economic growth as measured by real GDP is a measure of prosperity and purchasing power of the economy, positively affecting the prospects for higher rates of return on investments, and is therefore, one of the important pull factors for foreign

investment. With economic growth, a range of services including tourism, education, infrastructure, etc., become more accessible and advanced, encouraging foreign citizens to come to India for recreational and medical tourism, and education. Higher economic growth also enables more Indian students to study abroad, keeping other things constant.

It may be said that the economic dimension of globalization appeared to give greater impetus to economic growth, and as the country grew, it attracted more foreign investments, innovations and products, tourists and students. Higher growth is also found to have enabled more Indians to study abroad with increased purchasing power.

While the findings of this section have plausible explanations, it may be noted that the results depend on how the indicators of globalization have performed in the study period. A particular indicator may *a priori* Granger cause economic growth, but if its values have not been very promising in the case of India, they may not be found to have statistically significant causation effect. The results of the Granger Causality test in this section, thus, are specific to the Indian economy.

5.2 CAUSALITY BETWEEN DIMENSIONAL INDICES OF GLOBALIZATION AND ECONOMIC GROWTH

The previous section examined the causality between economic growth and the indicators of globalization in their individual capacity. However, these indicators are highly inter-connected and combine together to represent a particular dimension of globalization, such as, economic, financial, political, technological, and social. These dimensions, in turn, are also interconnected and together, represent globalization of the economy in its entirety. Keeping this in mind, this section examines the Granger causality between the dimensional and composite indices of globalization, and economic growth. The construction of the indices and their values and trends are as discussed in the previous chapter. GDP at constant prices has been used as a proxy for economic growth, and the period of analysis is 1990-91 to 2019-20. Before applying the Granger causality test, the tests for cointegration and stationarity of the time series have been carried out. The findings are presented below.

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Cointegration Test

The co-integration test is an econometric test which is a precondition for testing the long run relation between two or more variables having unit root. For this purpose, the Johansen cointegration test, (Johansen, 1991) has been used for the time series of economic growth and dimensional and composite indices of globalization, which have been found to have unit root, so as to estimate the long run relation between them. The existence of cointegration implies that there exists a uni-directional or bi-directional causality between the time series. The null hypothesis of cointegration is stated as absence of cointegration which can be rejected only against the valid proof of data. The null hypothesis can be rejected using two approaches, viz., trace statistics and maximum Eigenvalues.

The first approach of the Johansen cointegration test in Table 5.4 indicates that at most six co-integration equations have trace statistics greater than the corresponding critical values. The result is found to be significant at 0.01 and 0.05 level. This reveals that the time series is fit for the long-run relation, that is, the time series of economic growth and dimensional and composite indices of globalization have a long run relationship.

Table: 5.4 Co-integration between Economic Growth and Globalization using Trace Statistics

Unrestricted Cointegration Rank Test (Trace)				
GDP, EGI, FGI, PGI, TGI, SGI, CGI				
Hypothesized	Eigenvalue	Trace	0.05	
No. of CE(s)		Statistic	Critical Value	Prob.**
None *	0.969059	248.4226	95.75366	0.0000
At most 1 *	0.910466	154.5798	69.81889	0.0000
At most 2 *	0.792509	89.42503	47.85613	0.0000
At most 3 *	0.649848	46.96299	29.79707	0.0002
At most 4 *	0.423774	18.62950	15.49471	0.0163
At most 5**	0.129533	3.745599	3.841465	0.0529

* Significant at 1% level; ** Significant at 5% level
Source: Computation using EViews
GDP: Gross Domestic Product; **EGI:** Economic Globalization Index; **FGI:** Financial Globalization Index; **PGI:** Political globalization Index; **TGI:** Technological Globalization Index; **SGI:** Social Globalization index; **CGI:** Composite Globalization Index

Table: 5.5 Co-integration between Economic Growth and Globalization using Maximum Eigenvalue

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
GDP, EGI, FGI, PGI, TGI, SGI, CGI				
Hypothesized	Eigenvalue	Maximum-Eigenvalue	0.05	
No. of CE(s)		Statistic	Critical Value	Prob.**
None *	0.969059	93.84286	40.07757	0.0000
At most 1 *	0.910466	65.15474	33.87687	0.0000
At most 2 *	0.792509	42.46203	27.58434	0.0003
At most 3 *	0.649848	28.33350	21.13162	0.0041
At most 4 **	0.423774	14.88390	14.26460	0.0399
At most 5**	0.129533	3.745599	3.841465	0.0529

* Significant at 1% level; ** Significant at 5% level

Source: Computation using EViews

GDP: Gross Domestic Product; **EGI:** Economic Globalization Index; **FGI:** Financial Globalization Index; **PGI:** Political globalization Index; **TGI:** Technological Globalization Index; **SGI:** Social Globalization index; **CGI:** Composite Globalization Index

The second approach of the Johansen cointegration test which is based on maximum Eigenvalues (Table 5.5) also reveals that at the most six co-integration equations have Eigenvalues greater than the corresponding critical values. The result is found to be significant at 0.01 and 0.05 levels. The findings imply that the time series are fit for the long-run relation. In other words, it can be concluded that there is a long run relationship between the time series of dimensional and composite indices of globalization and economic growth. The fact that the time series co-integrate by both the approaches implies that a uni-directional or bi-directional causal relation between the dimensions of globalization and economic growth exist.

Stationarity Test

As stated earlier, before using the Granger causality test, it is necessary to confirm if the times series are stationary. For this purpose, the Augmented Dickey Fuller (ADF) test has been used. The null hypothesis of ADF is that there is a unit root in the time series, and it can be rejected only where there is a valid proof against it. The series that is found to have a unit root, is then transformed to the first or second difference, as required, and tested for stationarity after the transformation. Accordingly, the indices of financial and overall globalization have been transformed to first difference, and economic, political and social

globalization indices have been transformed to second difference. Technological globalization index has been converted to log to remove the unit root and make it stationary.

Granger Causality Test Results

Having checked for cointegration and stationarity of the time series data involved in the analysis, the Granger causality test has been applied between economic growth and the globalization indices. The null hypothesis of the test is that there is no causality between the variables. It can be rejected only at a significance level of one, five or at most ten. Table 5.6 presents the results of the Granger causality test. It is found that the causality is uni-directional, running from economic growth to globalization in some cases, and from globalization to economic growth in some others, using dimensional and composite indices of globalization.

Table: 5.6 Granger Causality between Economic Growth and Globalization Indices

Granger Causality Results:	F-Statistic	Prob.
Economic Globalization Granger Causes GDP	6.34483*	0.0070
Technological Globalization Granger Causes GDP	2.55246***	0.1057
Composite Globalization Granger Causes GDP	2.77369***	0.0843
GDP Granger Causes Financial Globalization	5.68356*	0.0102
GDP Granger Causes Political Globalization	2.59470***	0.0984
GDP Granger Causes Social Globalization	8.05936*	0.0025

* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level

Source: Computation using EViews

One-way Causality: Globalization to Economic Growth

The results show that there is a one-way causality from economic, technological and overall globalization to economic growth. All are statistically significant. It may be noted that the three forms of globalization are taken in terms of indices constructed using PCA technique, based on the relevant indicators of globalization. Economic globalization is bound to cause acceleration of economic growth because its indicators typically include variables related to foreign trade which is further bifurcated in terms of merchandise trade and trade in services. It also includes depth indicators of foreign trade in terms of import penetration in domestic demand as well as a measure of relative position of India's trade vis-à-vis global trade. Since all these indicators have demonstrated robust growth during

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the study period, it is not surprising that they are found to give a push to growth of the economy.

Technological globalization, through progress in research and development and a wider coverage of mobile cellular usage, encourages investment along with the impact of increasing capital goods, and in the long run leads to improvement in productivity in various sectors of the economy and thereby, accelerates the pace of economic growth. Technological globalization also enables new product design and development through continuous research which would help the country to gain competitive edge in international trade as well.

Interestingly, the composite index of globalization which includes 31 indicators spread over five dimensions of globalization, is found to Granger cause acceleration in India's economic growth which is as expected. This is because, as established in the previous chapter, there is a high degree of correlation between various dimensions of globalization. This is also found in Reeshan and Hassan (2017). It implies that the government should encourage an increase in the level of globalization in all its dimensions, but particularly, economic and technological. The latter have a high degree of positive correlation with other dimensions of globalization as well.

One-way Causality: Economic Growth to Globalization

Uni-directional causality running from economic growth to globalization is found in the case of financial, political and social dimensions of globalization. GDP is the most common indicator not only of the performance of the economy but also its future prospects. Economic growth improves the chances of higher rates of return on investments, both on foreign direct investment and foreign portfolio investment, in the present context. This encourages inflow of foreign investment into the country. Strong economic growth which establishes the global bearing of the country, induces other countries to enter into trade and investment arrangements with the former, as also, technology transfers. The international standing of the country in regional and multilateral organizations also becomes more commanding when its GDP grows. Ultimately, all these factors result in enhanced levels of social globalization. With increased real GDP, there is all round development, including

better infrastructure and institutions and increased spending abilities of its citizens. The combined impact of these factors is seen on social globalization as established by the findings of the analysis.

5.3 EMPIRICAL ANALYSIS OF GLOBALIZATION-GROWTH RELATIONSHIP

In the present section the relationship between growth and globalization has been further assessed using the OLS technique. While the Granger causality technique is a statistical hypothesis test for determining predictability of one set of time series on the basis of another time series, the significance of the relationship can be known with the help of the OLS technique of regression analysis. Different models have been constructed wherein, the variables have been transformed into log form or should be stationary at level $I(0)$, first difference $I(1)$ or second difference $I(2)$, to avoid spurious results. The GDP is transformed into log and then changed to first difference $I(1)$ to make it stationary. All the other variables are transformed to the first difference or second difference.

Application of regression analysis requires the fulfillment of certain assumptions. The regression analysis requires that the variables are linear and normally distributed, and satisfy the condition of homoscedasticity. The variables should also not have multi-collinearity and auto-correlation. For this purpose, the residual diagnostic tests have been conducted for each model to test if it satisfies the assumptions of regression. 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 each diagnostic test are that there is normality, homoscedasticity, and absence of serial correlation, and are checked at appropriate p values.

The regression models are presented in two sub-sections, in which the first sub-section is based on the models where Total Factor Productivity (TFP) has been used as a proxy for economic growth as the dependent variable. The second sub-section is based on GDP at constant prices as a proxy for the dependent variable, economic growth. All models are based on the causality obtained by applying Granger causality test as presented in the previous section.

5.3.1 Empirical Analysis of Globalization and Economic Growth with Total Factor Productivity (TFP) as the Dependent Variable

In the literature, the linkage between globalization and economic growth has been examined using alternative proxy variables to represent economic growth, one of which is the total factor productivity (TFP). The Neo-classical growth theories held the view that international trade impacts economic growth. Grossman and Helpman (1991) analyzed the growth models involving Research and Development (R&D) and international trade. They identified the channels for openness in terms of international flow of goods and services, international transmission of ideas and movement of capital. These international transmissions were postulated to improve technologies which lead to increase in the productive capacities, and thereby, economic growth. Grossman and Helpman (1990); Rivera-Batiz and Romer (1991); and Matsuyama (1992), have examined models of production which developed a link between growth and foreign trade by knowledge transfer and specialization. Studies such as Chen (1997), Tamura (2002), Miller and Upadhyay (2000), Edwards (1998), Borzenstein et al. (1998) and Wu (2004) have highlighted that the trade openness and investment in human capital contributes toward increasing economic growth through TFP in cross-country studies. Several other studies have provided evidence on how FDI affects TFP and hence increases economic growth. FDI increases the stock of knowledge by training labour and skill acquisition which in turn increases the TFP. Bardhan and Kletzer (1984), Mello (1999), Kose et al. (2009), and Borzenstein et al. (1998) have developed a linkage between the capital model embodying technology, and international trade, where labour productivity increase on account of learning by doing. These studies support the use of TFP as a proxy for economic growth in the empirical analysis of the growth-globalization linkage.

The present study has used individual indicators of globalization as well as dimensional and composite indices of globalization as independent variables, apart from control variables, to examine their impact on economic growth represented by TFP. The Gross Fixed Capital Formation (GFCF) is used as a proxy for capital. Gross Enrolment Ratio (GER) for elementary, secondary and higher secondary levels of school education (E_GER, S_GER and HS_GER) have been used as alternative proxy variables for labour.

Alternatively, the working age population as a percentage of population (WAP) and Human Capital Per Person (HCPP) have also been used to represent the labour.

Table 5.7 Models using Total Factor Productivity as Dependent Variables

VARIABLES	MODELS				
	I	II	III	IV	V
CONSTANT	-0.09 (-1.77)***	-0.09 (-1.68)***	0.013 (2.52)*	0.003 (1.72)**	-0.08 (-1.62)***
WAP	0.001 (1.97)**	0.001 (1.97)**	-	-	0.001 (1.70)***
GER	-	-	0.087 (1.70)***	0.14 (2.80)*	-
GFCF	0.08 (1.90)**	0.06 (1.76)***	0.046 (1.78)***	0.09 (3.72)*	0.12 (1.89)***
T_GDP	-0.002 (-3.22)*	-0.001 (-1.72)***	-	-0.001 (-2.11)**	-
IM_P	-	-	-0.003 (-3.54)*	-	-
FDI_GDP	0.02 (2.49)*	0.01 (2.34)**	-	-	-0.02 (-3.66)*
FII_GDP	-	-	-	0.006 (2.03)**	0.01 (3.56)*
PTA	-	-	-	-	0.003 (1.79)***
R_GDP	-	-0.02 (-1.88)***	-0.02 (-2.09)**	-	-
EGI	-	-	-	-	-0.001 (-2.28)**
FGI	-	-	0.004 (2.68)*	-	-
R^2	0.39	0.47	0.53	0.44	0.50
D-W TEST	1.92	1.88	1.66	1.80	1.83
NORMALITY	0.57	0.66	0.48	0.76	0.14
HOMOSCEDASTICITY	0.11	0.15	0.48	0.14	0.21
ABSENCE OF SERIAL CORRELATION	0.15	0.14	0.54	0.59	0.15

Source: Computations using EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
Figures in the brackets are t-values
WAP= Working Age Population as a % of Population; **GER**= Gross Enrollment Ratio; **GFCF**= Gross Fixed Capital Formation; **T_GDP**=Trade to GDP; **FGI**=Financial Globalization Index; **FDI_GDP**= FDI to GDP; **EGI**= Economic Globalization Index; **R_GDP**= Remittances to GDP; **FII_GDP**= FII to GDP; **IM_P**= Import Penetration; **PTA:** India's Participation in Number of Trade Agreements

The HCPP is the knowledge, skill and expertise that the average person possesses in an economy. The higher the accumulation of human capital in an economy due to increasing levels of average education, it is expected to increase labour productivity. HCPP is used as a proxy for labour based on this premise. While various models have been attempted using

alternative sets of variables, five models were found to be significant as reported in the Table 5.7.

MODEL I: $TFP = \propto + \beta_1 WAP + \beta_2 GFCF + \beta_3 T\_GDP + \beta_4 FDI\_GDP + \varepsilon$

Model I regresses TFP on two variables of globalization which represent openness measures of economic globalization, i.e., trade to GDP and FDI to GDP ratios. The results show that the former has a small negative effect on economic growth and is statistically significant. As such, increased foreign trade encourages businesses to improve their products and services to cater to the requirements of the foreign buyers so as to stay competitive in the international market with greater efficiency. This is expected to lead to overall improvement in productivity of both labour and capital. The results show a negative coefficient for the trade ratio, but it may be noted that the coefficient values are miniscule and this could be because of the different trend of the ratio over the three decades of the study period. Barring the decade of 2000, the first and last decade of the study period exhibits a nearly flat trend in the ratio. The combined impact of these trends has resulted into a negative coefficient for the trade ratio. It should also be borne in mind that the dependent variable is related to productivity and not total output. Therefore, though the increased trade ratio has certainly increased the total output of the country, it has not led to improvement in productivity.

FDI to GDP ratio, which is one of the prominent variables of financial globalization, is found to positively contribute to economic growth and is statistically significant. FDI normally brings in advanced technology and better organizational practices which tends to improve factor productivity (Wang, 2004; Miller and Upadhyay, 2000). Control variables representing labour and capital are found to have statistically significant positive coefficients.

The model explains only 37 percent of variation in the dependent variable, however, the Durbin-Watson statistic is close to two, implying absence of auto-correlation. Other requirements of the model in terms of normality and homoscedasticity are satisfied. Thus, the model satisfies all the pre-conditions of residual diagnostic and is reliable.

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MODEL II: $TFP = \propto + \beta_1 WAP + \beta_2 GFCF + \beta_3 T\_GDP + \beta_4 FDI\_GDP + \beta_5 R\_GDP + \varepsilon$

Model II tests for the significance of trade, remittances and FDI ratios as indicators of globalization. The first two variables continue to exhibit the same outcome as in Model I, with a marginal fall in the values of the coefficient. Remittances are not found to add to TFP as implied by its negative coefficient, however, result is found to be statistically significant only at a higher significance level. The explanatory power of the model has improved to 47 percent. The model satisfies all other assumptions.

MODEL III: $TFP = \propto + \beta_1 GER + \beta_2 GFCF + \beta_3 IM\_P + \beta_4 R\_GDP + \beta_4 FGI + \varepsilon$

The third model examines the effect of import penetration, remittance ratio and the index of financial globalization on TFP. Both, import penetration and remittances to GDP ratio are found not to have a positive effect on total factor productivity. The index of financial globalization has the desired positive impact on TFP. Greater inflow of foreign capital, both, in the form of equity and debt tends to have a positive influence on factor productivity. The values of the coefficients of control variables have improved relatively in the presence of the index of financial globalization. There is an improvement in the values of coefficient of determination, although the D-W statistic is found to be relatively lower. However, the normality, homoscedasticity and absence of serial correlation are established at higher probability values.

MODEL IV: $TFP = \propto + \beta_1 GER + \beta_2 GFCF + \beta_3 T\_GDP + \beta_4 FII\_GDP + \varepsilon$

The fourth model regresses TFP on two openness indicators of trade and capital flow just as the first model, however, the capital flow indicator is replaced by the FII to GDP ratio and the control variable used to represent labour has been replaced by GER. The trade to GDP ratio is found to have a negative effect on TFP and the FII to GDP has a positive effect on TFP. The coefficients of labour and capital have improved in this model. The explanatory power of the model also improved from 39 percent to 44 percent, compared to the first model. The Durbin- Watson Test statistic is 1.80 which is close to two, implying absence of auto correlation. The model satisfies all the pre-conditions of residual diagnostic and is reliable.

MODEL V: TFP $= \propto + \beta_1 WAP + \beta_2 GER + \beta_3 GFCF + \beta_4 FDI\_GDP +$

$$\beta_5 FII\_GDP + \beta_6 PTA + \beta_7 EGI + \varepsilon$$

Model V tests for the significance of FDI to GDP, FII to GDP, India's Participation in Trade Agreements (PTA) in numbers, and Economic Globalization Index (EGI) as indicators of globalization. The coefficients of capital openness ratios FDI to GDP and FII to GDP have increased as compared to other models of TFP. However, in the presence of PTA, FDI to GDP is found to have a negative coefficient. The FII ratio continues to have a positive effect and is significant at one percent. Increased partnership in trade agreements with more countries is found to positively affect total factor productivity on account of the greater integration it would lead to. It is statistically significant at five percent.

While in other models trade ratio was found to have positive effect on TFP, when the model takes the entire index of economic globalization as the explanatory variables, it is found to have a relatively weak negative effect on TFP as is evident in its coefficient value and the higher level of significance. The explanatory power of the model has improved to 50 percent. The model satisfies all other assumptions.

In summary it may be stated that in all models both labour and capital continue to have significant positive impact on economic growth. In all the models the foreign trade ratio is found to have negative coefficients in the case of India. As explained earlier this is because of the mixed trends over the three decades of the study period. In the case of the impact of capital flows on economic growth, the results largely suggest a positive impact.

5.3.2 Empirical Analysis of Globalization and Economic Growth using Gross Domestic Product as the Dependent Variable

This section analyzes the globalization-growth relationship using GDP at constant price as the dependent variable to represent economic growth. Most studies found in the related literature have used GDP to represent economic growth. These include, Dreher (2006), Barry (2010), Ray (2012), Meraj (2013), Maqbool-ur-Rahman (2015), Antiquisa and Deluna (2014), Kilic (2015), Sehrawat and Giri (2016), and Hasan (2019). The results are presented in Table 5.8.

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Table 5.8 Models using Gross Domestic Product (LGDP) as the Dependent Variable

VARIABLES	MODELS			
	I	**II**	**III**	**IV**
CONSTANT	-0.08 (-1.77)**	-0.15 (-2.15)*	0.02 (2.53)*	-0.08 (-1.63)***
WAP	0.002 (1.99)**	0.003 (3.34)*	-	0.002 (1.98)**
GER	0.12 (3.88)*	-	-	-
E_GER	-	-	0.0009 (1.76)**	-
HCPP	-	0.90 (2.60)*	0.79 (1.87)***	-
GFCF	0.028 (1.73)**	-0.003 (-1.80)***	0.0005 (2.53)*	-0.01 (-1.59)***
T_GDP	0.001 (2.15)*	0.002 (4.05)*	-	0.002 (3.22)*
R_GDP	-	-0.02 (-2.73)*	0.004 (1.63)***	-0.22 (-2.83)*
MFO	-	-	-	0.0006 (1.88)*
TGI	-	-	0.0005 (1.96)**	-
R^2	0.37	0.48	0.45	0.39
D-W TEST	1.81	1.90	1.95	1.83
NORMALITY	0.78	0.25	0.39	0.57
HOMOSCEDASTICITY	0.08	0.53	0.51	0.32
ABSENCE OF SERIAL CORRELATION	0.82	0.49	0.61	0.41

Source: Computations using EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
Figures in the brackets are t-values
T_GDP=Trade to GDP; **EGI**= Economic Globalization Index; **R_GDP**= Remittances to GDP; **GER**= Gross Enrollment Ratio; **TGI**= Technological Globalization Index; **HCPP**= Human Capital Per Person; **WAP**= Working Age Population as a percent of Population; **E_ GER**= Elementary Gross Enrollment Ratio; **IM_P**= Import Penetration

MODEL I: $LGDP = \propto + \beta_1 WAP + \beta_2 GER + \beta_3 GFCF + \beta_4 T\_GDP + \varepsilon$

Model I regresses one measure of openness of the economy, that is, the trade ratio along with the control variables such as GFCF for capital and working age population ratio and enrollment in elementary education as proxy variables for labour. All coefficients are found to have a statistically significant positive impact on GDP. It may be recollected that the trade ratio had a negative coefficient in models where TFP was taken as the dependent variable. However, when the dependent variable is changed to GDP the trade ratio now bears a positive coefficient as expected. The increase in trade gives access to global markets, technology, competitive business, and increases productivity. This is also

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substantiated by studies such as Morris and Fessehaie (2014) and Were (2015). The model explains 37 percent of variance in GDP, and satisfies the conditions of normality, absence of serial correlation and homoscedasticity. The D-W statistic is close to two indicating near absence of auto-correlation among the residuals

MODEL II: $LGDP = \propto + \beta_1 WAP + \beta_2 HCPP + \beta_3 GFCF + \beta_4 T\_GDP + \beta_5 R\_GDP + \varepsilon$

Model II is an extension of the first model. It uses trade to GDP ratio along with remittances to GDP ratio as independent variables for globalization. In this model the GER is replaced with HCPP along with WAP to represent labour, and GFCF is used as a proxy for capital. The trade to GDP and remittances to GDP ratios are statistically significant at five percent. Trade is found to have a positive effect whereas, the coefficient of remittances was found to be negative. The change in the independent variables increased the coefficient values of the indicators of globalization and labour. It is observed in the case of India that remittances in absolute terms have increased over the study period, and is among the top-ranking countries receiving remittances. However, in terms of ratio to GDP the remittances have shown a decline over the study period. The negative coefficient of the remittance ratio indicates that it has had a negative impact on economic growth. This may be attributed to remittances leading to an increased culture of dependency and reduced incentives to work. Charmi (2021) has also concluded that remittances slow down economic growth. This has been asserted in a study by Amuedo-Dorantes and Pozo (2023) who claimed that remittances not only act as a disincentive to work but also encourages conspicuous consumption. The model has higher explanatory power and its D-W statistic has improved compared to the previous model.

MODEL III: $LGDP = \propto + \beta_1 E\_GER + \beta_2 HCPP + \beta_3 GFCF + \beta_4 R\_GDP + \beta_5 TGI + \varepsilon$

Model III uses remittances to GDP and technological globalization index as independent variables for globalization. Both the variables are found to have a positive impact on GDP. It may be noted that, in the presence of TGI, the coefficient of the remittance ratio has turned positive although its value is very small. The TGI is an index which comprises

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various indicators such as global commodities as a percentage of population, patent application to total population, mobile subscription per 100 persons and research and development expenditure to GDP. The increase in the technological indicators indicates a spillover effect of technological development in a country, which creates opportunities to integrate economic activities ranging from consumption and exchange, savings and investments, production and distribution enabled by the technological flow and boosts the country's growth. The model explains 45 percent of variation in GDP and it satisfies the conditions of normality, homoscedasticity and absence of serial correlation which is also supported by the D-W statistic which has inched closer to two.

$$\textbf{MODEL IV: } LGDP = \propto + \beta_1 WAP + \beta_2 GFCF + \beta_3 T\_GDP + \beta_4 R\_GDP + \beta_5 MFO + \varepsilon$$

Model IV uses trade to GDP ratio, remittances to GDP ratio and membership in foreign organizations as independent variables to see the effect on GDP. This model is an extension of model II with membership in foreign organizations as the additional variable. The WAP and GFCF are used as variables to represent the labour and capital. Both are significant at five and ten percent. The coefficients of trade to GDP and membership in foreign organizations are positive and significant at one percent. Membership in foreign organizations helps a country to participate in the decision-making process, put forth their concerns and address those issues more effectively. The increase in the number of memberships at the global level, helps to build a strong relation with other dominant nations. These institutions play an important role by providing funding and technical support, and this helps in improving productivity. The remittances to GDP ratio has again turned negative in this model. The model explains 39 percent of variation in GDP and satisfies the conditions of normality, absence of serial correlation, and homoscedasticity. The Durbin-Watson test statistic is 1.83, and reveals near absence of autocorrelation in this model.

5.4 ANALYSIS OF SOCIO-ECONOMIC IMPACT OF GLOBALIZATION

Traditionally, globalization enhances trade in goods and services, labour and capital movement, access to ICT, flow of ideas and knowledge, and integration of economies. Globalization is an important driver for favourable transition in the socio-economic status

of the country. Socio-economic development is a process of progressive transformation of social institutions and economic wealth of a country. It embraces qualitative improvements in the lifestyle of people with quality education, skill development, health, gender equality, reduced poverty levels on account of increased opportunities for employment and higher incomes, etc. In recent years, the process of socio-economic development has evolved through numerous dynamic qualitative and quantitative indicators. The model of Doughnut Economics proposed by Kate Raworth in 2012 provides a framework that measures socio-economic development through various indicators, viz, water, food, social equity, political voice, peace and justice, education, income and work, health, education, networks, housing, gender equality, and energy.

Studies in the literature on socio-economic development and globalization use dynamic indicators such as the level of education, human capital, gender equality, health, and reduction in poverty, inequality, and unemployment. The present study uses the Gross Enrolment Ratio (GER), Enrolment in Elementary, Secondary and Higher Secondary Education levels and the ratio of Government Expenditure as a percentage of GDP to gauge the level of education. The study has attempted to use the Human Development Index (HDI) as a measure of human capital, and the Gender Inequality Index (GII) as a measure of gender inequality. HDI is a composite statistical index using the life expectancy, education and per capita income for measuring the composition of human capital. The GII as a composite index provides insight into gender disparity. The GII reflects the gender disparity in the dimensions of health, empowerment and labour market participation dimensions. In contrast to the HDI, the GII values close to one indicate a worse situation and values close to zero indicate fair equality.

The present study has also examined the impact of globalization on socio-economic development of India in terms of equality in the distribution of income. The GINI index is used to measure the extent of inequality in income distribution. It measures the deviation of the distribution of income or consumption expenditure from the perfectly equal distribution in an economy. The GINI index measures the area between the line of absolute equality and the Lorenz curve, which shows the actual distribution of income. Thus, a GINI index value of zero means perfect equality and the value of 100 implies perfect inequality.

Better employment opportunities for all is another important dimension of socio-economic development of a country. In the present study, the level of unemployment in India as a ratio to total labour force has been used to capture this dimension. Health being another important dimension, the study examines the trends in select indicators of health such as maternity mortality rate, infant mortality rate, and life expectancy.

The present chapter is organized into the following sub-sections. The first sub-section depicts the trends in the indicators of socio-economic development in the context of India. The second sub-section presents the findings related to the analysis of the impact of globalization on gender inequality. The next sub-section presents the results related to analysis of the impact of globalization on education. The last two sub-sections are related to the analysis of income inequality and unemployment.

5.4.1 Trends in Socio-Economic Development Indicators with Reference to India

It is important to examine the trends in the indicators of various dimensions of socio-economic development. The trends and growth rates show the flow of the indicators and it asserts the changes in the indicators over the study period from 1991 to 2020.

Health

Another dimension of socio-economic development is health, which implies physical, mental and social well-being of a person. Health contributes in achieving the socio-economic development of a country by increasing the well-being of society. Health can be affected through the income distribution, education, political and economic system, social and cultural environment, and health care services. In the present study, health as a dimension of socio-economic development is measured using the Infant Mortality Rate (IMR), Maternity Mortality rate (MMR) and Life Expectancy at birth.

- **Infant Mortality Rate**

Infant Mortality Rate (IMR) is the number of deaths of new born under the age of one year per 1000 births in a country. In India the IMR is found to have decreased in the study period from 86.5 in 1991 to 29.84 in 2020, which amounts to a fall of 65 percent. On compound growth rate basis this comes to a fall at the rate of 3.61 percent per annum. A decrease in IMR indicates that the life expectancy at birth increases. In the case of India, the life expectancy has grown at 0.59 percent CAGR. Examining decadal improvement in IMR it

is found that with each decade of the study period there has been a sharper fall in the IMR. In the first decade IMR declined by 2.84 percent; by 3.79 percent in the second decade and by 4.09 percent in the third decade in terms of CAGR. It may be said that globalization which brings along improved flow of information, better level of education, women empowerment, and change in culture and living standards on account of global migration, positively brushes on social attitudes. Along with that, improved medical facilities, better protection of children from infection, ensuring nutrition for mother and child, better consumption of nutritional foods in general have positively contributed to the lowering of IMR. Such linkages are also found in studies by Acemoglu and Robinson (2005) and Kudamatsu (2012). Additionally, they also claimed that the quality of democracy has a significant impact on reducing the IMR. The Government of India has come up with various health schemes with a view to reducing mortality under the mother and child health programs such as Pregnancy Risk Assessment Monitoring System (PRAMS), Janani Suraksha Yojna, Janani Shishu Suraksha Karvakaram (JSSK), Pradhan Mantri Matru Vandana Yojna (PMMVY), etc.

- **Maternity Mortality Rate**

Maternity Mortality Rate (MMR) is the number of deaths during delivery due to the complications in the pregnancy or child births per 100000 live births. The MMR in India has decreased drastically, from 560 to 97 death per 100000 live births in the study period. This amounts to a recorded decline at the rate of 5.86 percent on compound annual basis. Similar to the impact of government health care programs on IMR, in the case of MMR too there has been an increase in the rate at which it has declined over the three decades of the study period. In the first decade MMR declined at the CAGR of 4.5 percent. The rate of decline increased to 5.51 percent and 7.43 percent in the second and third decade, respectively. Thus, India has made a remarkable progress in reducing maternity death in the last two decades. It may be noted that government has been able to focus more on the social sector with the introduction of the economic reforms, including policies towards globalization, as the latter has enabled the government to reduce its role in purely economic activities.

- **Life Expectancy at Birth**

Another indicator of health is the life expectancy at birth, which indicates the number of years an infant would live. Over the study period the life expectancy at birth rate has increased from 59.05 to 70.15 from 1991 to 2020 (Fig. 5.1). This amounts to an increase at a CAGR of 0.59 percent. A rise in life expectancy means that a greater number of people would enjoy longevity of life. As stated earlier, among other things, globalization enables government to focus more on social sector and thereby affects public health by improving access to technology, sanitation, and medical facilities, and increasing the intake of nutritional diet, with change in life style. A supporting claim by Medez and Popkin (2004) noted the change in the structure of diet with the increase in the social globalization. The longevity is due to the better health care, hygiene, clean water, and healthy living. The study by Bergh and Nilsson (2010) on 92 countries claimed that increase in economic globalization increased the life expectancy at birth. This is also supported by Shahbaz et al. (2019), Alam et al. (2016) and Ali and Audi (2016) with reference to different countries.

Fig. 5.1: Indicators of Health
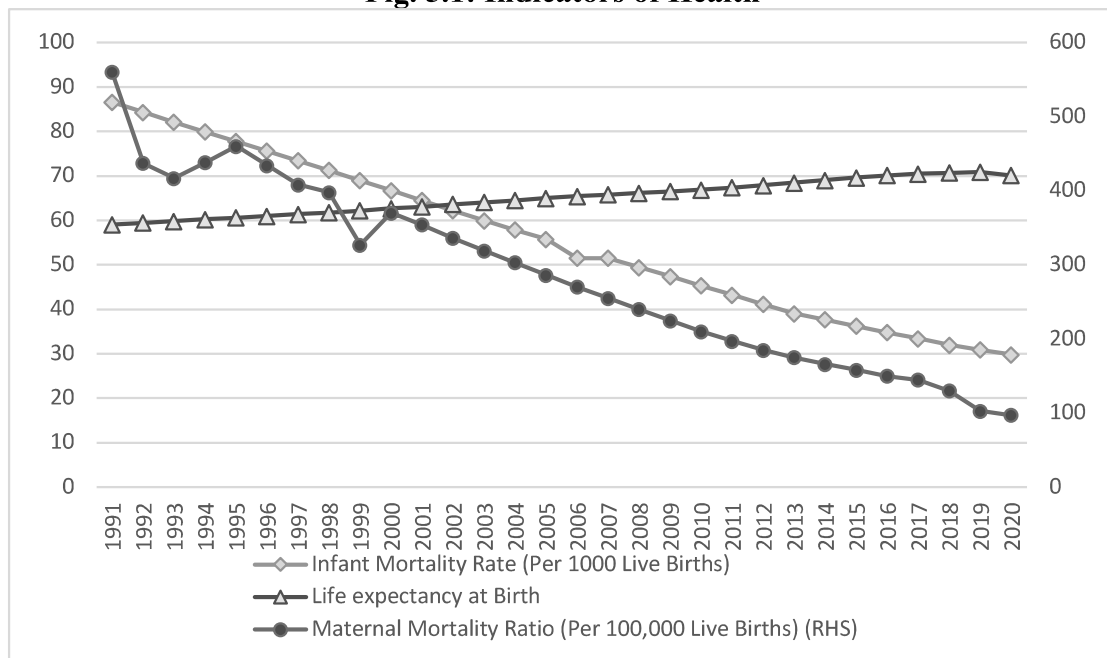
Source: World Bank Development Indicator

Education

Education is a key for creation of knowledge, imbibing values and enriching the culture. Education implies enrichment of people's understanding of knowledge, access to scientific

concepts, technology, improvement in capacity, and efficiency. The level of education of the population in an economy is an important aspect of its socio-economic development. Park (1996), Ahluwalia (1976), Barro (2000), and Alderson and Nielsen (2002) have used different indicators of education such as average or median years of schooling, gross enrollment rates of primary, secondary and tertiary levels, and government expenditure on education as a percentage of GDP.

The level of education in the present study is measured using ratio of government expenditure on GDP and GER at elementary, secondary, and combined levels of school education, and GER in higher education. Stark (2004) suggests that increase in globalization increases the literacy rates, also encourages individuals' incentive to invest in own education, and increases the race toward quality education. Increased flow of information on account of better education would change the lifestyle of people. Stark (2004) relates increase in social globalization such as tourism and information flows with increased literacy levels.

- **Gross Enrollment Ratio (GER)**

GER is the highest degree of participation at a specific level of education, regardless of the age, expressed as a percentage of the official age group at that level of education. The GER at different levels of education is used in the present study i.e., the GER at elementary, secondary and total enrollment at school level and GER of higher education level.

The GER at elementary level is found to have increased with a CAGR of 0.41 percent. It increased from 86 in the 1991 to 97 in 2020. The GER at secondary and total enrolment GER in school level is found to have grown at compound annual rates of 4.73 and 2 percent, respectively.

The GER at higher education has changed from 5.96 in 1991 to 27.1 in 2020. It records the highest enrolment compared to that in school education with a CAGR of 5.36 percent. In the first decade the higher education enrollment increased by 1.64 percent. However, a tremendous change in GER is found in the second decade with a CAGR of 8.07 percent. But, the enrollment in higher education dipped in the third decade by 6.09 percent CAGR. Similar to the improvement pattern in HDI and GII, the enrollment ratio shows the highest growth rate in the second decade of the study period.

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- **Ratio of Government Expenditure on Education (GEE) as a Percentage of GDP**

The present study employs government expenditure on education (GEE) as a ratio to GDP as a proxy variable for education with the premise that the two are closely and positively related. In the case of India, we find positive correlation, in the range above 0.5, between the GEE ratio and enrolment in education in India, be it combined or at elementary, secondary and higher education. This has been established in studies such as Sylwester (2002), Braun (1988), and Figueroa (2015). Kärkkäinen (2006) who claimed that in addition to government expenditure on education as a share to GDP the government funds education indirectly via financial aid to students and institutions. It should also be noted that government schools comprise more than 80 percent of the total number of schools in India (USIDE, 2022). Direct expenditure on education is not the sole way of government funding of education; the government also funds indirectly via transfers and payments to private entities.

Fig. 5.2: Indicators of Education
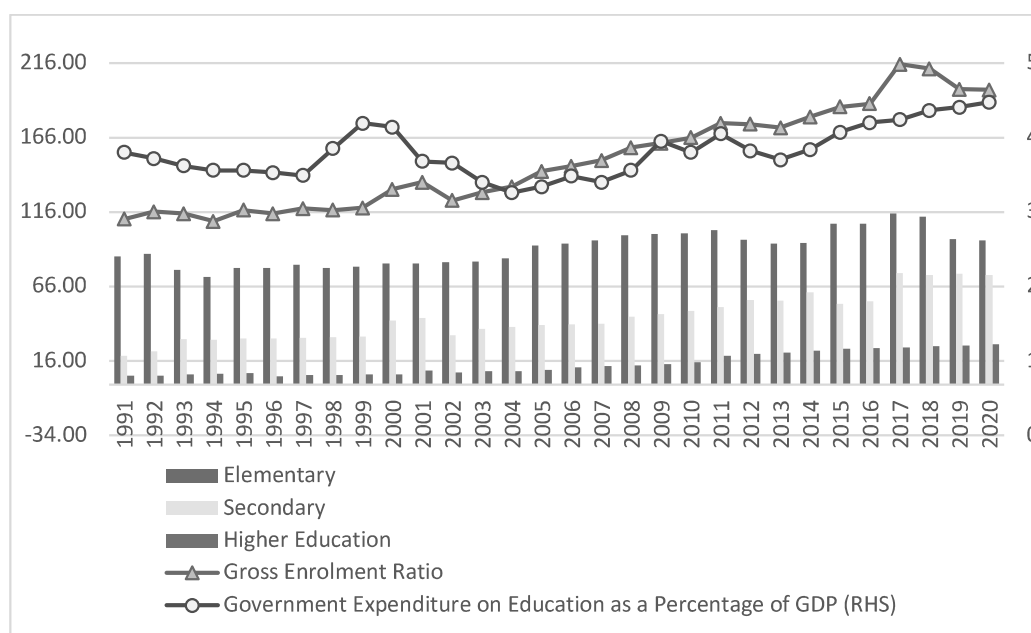
Source: All India Survey on Higher Education (AISHE) Report

The ratio of government expenditure on GDP has grown from 3.8 percent in 1991 to 4.47 percent in 2020. Increase in the GEE is found to have a compound annual growth rate of 0.56 percent. The GEE is found to have a CAGR of 0.95 percent CAGR in its first decade.

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The second decade witnessed a negative growth 0.85 percent in GEE. However, the third decade shows acceleration in the CAGR to 1.63 percent. This may be attributed to increased focus of government on social sectors (MoF, GoI, 2023). A higher ratio of government expenditure on education suggests increased priority given to education in India. It may also be noted that low government expenditure on education implies that people have to depend more on the private resources of education, which may be particularly prohibitive for the poor.

Human Capital

In endogenous growth theories, human capital is recognized as an important element for increasing economic growth. The accumulation of human capital includes key aspects such as education, skill, knowledge, and training that people accumulate throughout their lives, which helps to realize their productivity and potentiality. Eigbiremolen and Anaduaka (2014) assert that human capital development is a continuous process of acquiring knowledge, education, skill and experience, represents the skill and ability of human resource, and they also consider wit as crucial for development.

Fig. 5.3 depicts HDI of India over the study period. India's HDI has increased from 0.43 in 1991 to 0.64 in 2020. On the compound annual basis, it shows a growth of 1.38 percent. Comparing the decadal growth rates of HDI in India, in the first decade the HDI shows an increase with 1.46 percent CAGR. The second decade of the study period during which the major positive impact of globalization in India was observed, also exhibited an increased CAGR of 1.70 percent in the HDI of India. Globalization helps to foster productivity by increasing the stock of knowledge, research and development, labour training, skill enhancement along with FDI. It also enhances the physical capital and human capital and promotes productivity of a country. This has also been asserted by Chang and Lee (2010), Dreher (2006) and Dreher et al. (2008).In the third decade the improvement in HDI has happened at a slower CAGR of 0.98 percent. This may be attributed to the lack of momentum in introducing further reforms, and to global recession which affected growth prospects of India as well.

Gender Equality

Equality in gender is another dimension of socio-economic development of any country, which can be captured by measures related to gender parity. The present study uses the

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composite index the Gender Inequality Index (GII), to measure gender inequality. It comprises indicators related to reproductive health, empowerment and labour market (WHO). The reduction in disparity between genders is reflected through the reduced maternal mortality ratio and adolescent birth rate, better education through increase in enrollment of women in education, greater representation of women in parliaments, and increased labour force participation by women. Apart from these indicators social development is also reflected in better nutrition of children, reduced fertility and increase in the average age of marriage (Shen and Williamson, 1999). The data for India's GII shows a decline from 0.71 in 1991 to 0.49 in 2020 (Fig. 5.3). The overall study period shows a decline in the GII with a CAGR of -1.27 percent. The initial decade, 1991 to 2000 showed a decline in GII of 0.80 percent on CAGR basis, while in the second and third decade of the study period, there has been a rapid fall at the rate of 1.28 and 1.67 percent, respectively.

Fig. 5.3 Human Development Index and Gender Inequality Index
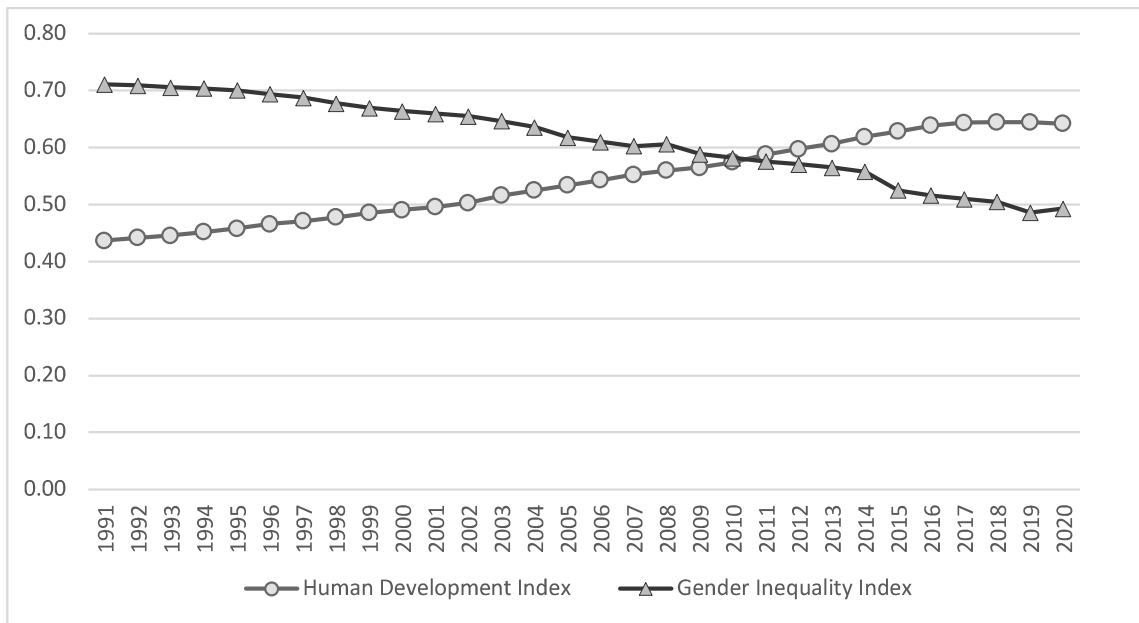
Source: World Bank Development Indicator

The fall in the gender gap in the third decade was much deeper than the first two decades. Increased social globalization of India may be considered as one of the contributing factors to this improvement, along with increased prosperity of the Indian economy, for which globalization has also played an important role.

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Employment

An important dimension of socio-economic development of a country is its level of employment. With increase in globalization as trade and investment improves it is expected to create more employment opportunities. The present study uses the rate of unemployment to examine its trend since the introduction of economic reforms over the past three decades. The unemployment rate is measured by the ratio of total number of unemployed persons to total labour force. Due to the initial impact of liberalization and globalization, which typically results into displacement of labour on account of structural adjustments, it is found that the rate of unemployment increased over the period 1991 to 2005 at a CAGR of 1.84 percent.

Fig. 5.4 Unemployment as a Percentage of Total Labour Force

Source: World Bank Development Indicator

However, in the later period 2005 to 2019, with the general increase in private economic activities observed in India along with new business models, and government initiatives like, Make in India, Skill India, increased focus on MSMEs, etc., employment opportunities have increased although the nature of employment has not been of the desirable kind. This can be seen in the fall in the unemployment rate at 2.14 percent in the second half of the study. The rate of unemployment in India increased from 6.74 percent in 1991 to 10.19 percent in 2020 (Fig. 5.4). While globalization is expected to improve

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productivity of labour and create employment opportunities, it is also equally true that intense competition and technological development leads to replacement of labour by capital on cost considerations. This results into increase in unemployment as also asserted by Rama (2003). The increase in the unemployment rate is the highest in 2020. This may be attributed to initial impact of Covid-19 pandemic (Hindustan Times, 2020).

Income Equality

Income inequality is an umbrella term which shows how unevenly income is distributed over the population in a country. Fig. 5.5 highlights the GINI index as a measure of income inequality. Globalization tends to reduce inequality on account of increase in the skill, education and training that can make a significant difference to close the gap.

Fig. 5.5: GINI Index of India
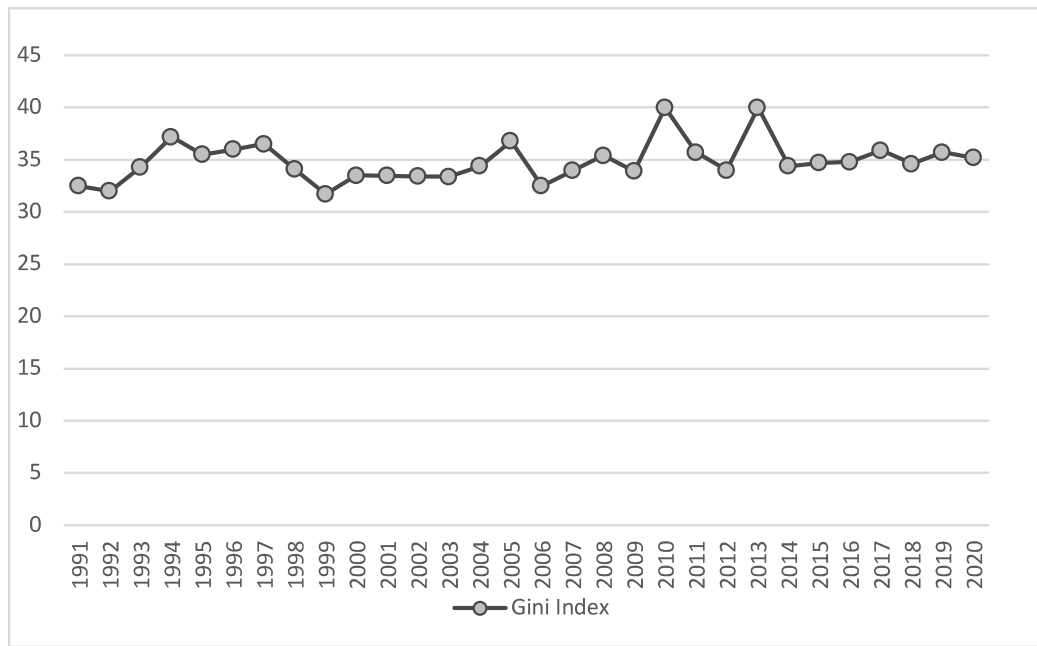
Source: Database of Federal Reserve Bank of St. Louis

Deardorff and Stern (1994) and Beaulieu, Bennaroch, and Gaisford (2011) claim that trade openness would benefit the developing countries as it would increase the comparative advantage and push the demand for unskilled workers and will push up their wages. This would in turn reduce the within-country inequality. However, in the recent years, the world is witnessing a concern toward growing inequality with the rapid spread of globalization. Meschi and Vivarelli (2009) argue that trade openness would enhance technology transfers

from advanced countries which are more skill-intensive and would require a shift in labour in favour of skilled labour. This would create more wage-gap.

The data for India depicts that the income inequality in India has remained somewhat flat, ranging between 32.5 and 35.2, at the beginning and end of the study period. In the first decade, there was a mild decline in income equality to 31.7. However, from that point on there was a continuous rise with the GINI index peaking at 40 in the year 2010 and 2013. For the entire study period the index has increased at a CAGR of 0.27 percent. It may be noted that while human development and gender development have shown improvement, globalization seems to have widened the gap between the rich and poor in India.

5.4.2 Empirical Analysis of the Impact of Globalization on Education

The present study attempted to examine alternative ARDL models to check for the impact of globalization on the level of education, using different indicators as proxy for the latter. However, the models were not found to be significant. The ARDL model used in the present study, employs government expenditure on education (GEE) as a ratio to GDP as a proxy variable for education.

Model I $\quad GEE\_GDP = \alpha + \beta_1 T\_GDP + \beta_2 FDI\_GDP + \beta_3 FGI + C + \varepsilon$ ……….. **(1)**

The ARDL (4, 4, 4, 3) model of education is based on the lag values of the Government Expenditure on Education, Trade and FDI, all as ratios to GDP, with lag periods obtained on the basis of the AIC. The first and second lags of GEE ratio are found to be insignificant in effect on the current period values of the GEE ratio. The third and fourth lags of GEE are insignificant and do not affect the current period GEE. But based on the Wald test all four lags influence the current period GEE ratio as is evident in the F- statistics (19.92) and is significant at 0.05 percent. The trade ratio has a significant negative effect on the dependent variable at its level, first, second and fourth lags. The third lag of the trade ratio is found to be insignificant. The Wald test is found to be significant at 0.05 percent with F-statistics at 4.74.

FDI to GDP is positively significant in its level, first and third lags. It is not found to be statistically significant in its second lag. The Wald test F-statistics is 19.92 and it reveals that the FDI to GDP can jointly influence the level of education at one percent of significance.

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Table: 5.9 ARDL Model using Government Expenditure on Education to GDP

as Dependent Variable

Variables	Coefficient	t-Statistic
GEE_GDP (-1)	-0.17164	-0.49345
GEE_GDP (-2)	-0.27059	-1.46028
GEE_GDP (-3)	-0.30821	-3.13384**
GEE_GDP (-4)	0.627748	2.636815**
T_GDP	-0.03104	-2.48774**
T_GDP (-1)	-0.04566	-2.02079***
T_GDP (-2)	-0.08036	-3.61477*
T_GDP (-3)	0.018251	1.544251
T_GDP (-4)	-0.07878	-4.21384*
FDI_GDP	0.5938	5.533794*
FDI_GDP (-1)	0.721228	2.188695***
FDI_GDP (-2)	-0.12256	-0.76945
FDI_GDP (-3)	0.309168	1.843326***
FGI	-0.03147	-5.27877*
FGI (-1)	-0.01608	-2.0583***
FGI (-2)	-0.01488	-2.4354**
FGI (-3)	-0.01155	-3.87187*
FGI (-4)	-0.01289	-2.31748**
C	0.448588	3.755217*
R^2	0.90	-
D-W TEST	1.72	-
NORMALITY	0.11	-
HOMOSCEDASTICITY	0.28	-
ABSENCE OF SERIAL CORRELATION	0.90	-
F-Stat	6.72	-
Upper Bound	4.66	-
Lower Bound	4.61	-

Source: Computation using EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
GEE_GDP= Government Expenditure on Education to GDP; **T_GDP**= Trade to GDP;
FDI_GDP= FDI to GDP; **FGI**= Financial Globalization Index

The FGI is significant in its level and all four lags at one, five and ten percent, with negative coefficients. Thus, increased financial globalization is found to improve the level of education in India. These results are in line with Park (1996), Ahluwalia (1976), Barro (2000), and Alderson and Nielsen (2002) which have used capital flows and trade ratios as indicators of globalization. In the case of India though, trade ratio is not found to have a positive impact.

The F-statistics (6.72) is greater than the upper bound (4.66) at one percent level of significance which establishes the long run. It establishes co-integration between education and globalization. The model satisfies the condition of absence of heteroscedasticity and serial correlation, and satisfies the normality condition. The Durbin Watson test statistics is 1.72 and the model explains 90 percent of variation in the dependent variable. The equation can be written as:

$$GEE\_GDP = C(1)* GEE\_GDP (-1) + C(2)* GEE\_GDP (-2) + C(3)* GEE\_GDP (-3) + C(4)* GEE\_GDP (-4) + C(5)*T\_GDP + C(6)*T\_GDP(-1) + C(7)*T\_GDP(-2) + C(8)*T\_GDP(-3) + C(9)*T\_GDP(-4) + C(10)*FDI\_GDP + C(11)*FDI\_GDP(-1) + C(12)*FDI\_GDP(-2) + C(13)*FDI\_GDP(-3) + C(14)*FGI + C(15)*FGI(-1) + C(16)*FGI(-2) + C(17)*FGI(-3) + C(18)*FGI(-4) + C(19).......(2)$$

The model of education reveals that it is fit for establishing short-run and long-run relationships. The trade ratio and FGI have negative coefficients which suggest that an increase in these indicators exert a negative impact on the level of education in the context of India. In other words, increased globalization in terms of increased trade and financial globalization index has not exerted any positive effect on the education level. It may be noted that the number of government schools and the number of students enrolled in government schools have shown an increase over the years even as involvement of the private sector in education has increased in India. However, it may be concluded that globalization in some of its dimensions has not led to improvement in the level of education in India. Only in the case of the FDI ratio a positive impact on the level of education has been found in the case of India.

5.4.3 Empirical Analysis of the Impact of Globalization on Gender Inequality

This section examines the impact of globalization on one aspect of socio-economic development of India, namely, gender equality based on Gender Inequality Index (GII). For this purpose, empirical analysis has been carried out using the ARDL model of GII. The data has been obtained from World Bank data sources. The ARDL models with dimensional indices of political and technological were not found to be significant and are therefore, not reported here. This section presents the findings of the model involving the impact of dimensional indices of globalization, namely, economic, financial and social. Globalization is causing a shift in gender roles and norms with more cultural exchange,

increased information through television and internet, changing perceptions and adoption of more egalitarian attitudes (World Bank, 2011). It is, therefore, expected that increased level of globalization in India would have resulted into lowering of gender inequality. With regard to the impact of globalization on gender inequality Kucera (1998), Seigmann (2007), and Braunstein and Brenner (2007) concluded that trade openness and FDI reduced the gender gap in developed countries. Manda (2002) and Menon and Rodgers (2009), on the other hand, found that increased competitiveness through trade liberalization increased the gender-based wage gap in manufacturing sector in Kenya and India.

Model I $GII = \alpha + \beta_1 EGI + \beta_2 FGI + \beta_3 SGI + C + \varepsilon$ .... (1)

The ARDL (4, 4, 4, 4) model of gender inequality is based on the lag values of the GII, EGI, FGI and SGI. The lag periods are obtained based on the Akaike Information Criterion (AIC). The first, second and fourth lags of GII are found to have significant negative impact on the current period GII, at significance level of one and five percent. The third lag is not found to be significant. The Wald test has F-statistics as 11.55, which is significant at one percent. Thus, based on the Wald test it is established that the lag values of GII influence its current period value.

The EGI is found to have a negative influence in its second, third and fourth lag at 0.05 level of significance, but is insignificant at level and first lag. However, the Wald test F-statistics is 15.81 and is significant at one percent. Thus, the lag values of EGI are significant in this model for explaining the GII. In other words, it can be said that an increase in EGI reduces gender inequality.

The FGI is found to have negative influence on GII in all the lag periods, and is significant at 0.01, 0.05 and 0.10 levels of significance, respectively. Thus, an increased level of financial globalization in India is found to have reduced gender inequality. This could be due to increased employment opportunities and greater gender diversity practiced by MNCs, as also found in Sharma (2021), and Coniglio et al. (2017). The Wald test is not required in the case of FGI, as it has been found to be significant in all its lags. With social globalization, it is expected that exposure to diverse cultures and a modern outlook would take place, ideally reducing adverse attitudes towards females in India. However, as per

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results obtained, the SGI is found to have significant positive impact on gender inequality in its all four lag periods at one percent level of significance. It may be noted that social and cultural impacts are complex in nature and difficult to capture, and are not within the scope of the present study.

Table: 5.10 ARDL Model using Gender Inequality Index as Dependent Variable

Variables	Coefficient	t-Statistic
GII (-1)	-0.78415	-4.80247*
GII (-2)	-1.16272	-4.92662*
GII (-3)	-0.46974	-1.74428
GII (-4)	-0.70478	-2.42356**
EGI	-0.00114	-1.77419
EGI (-1)	-8.14E-05	-0.18905
EGI (-2)	-0.00079	-2.8143**
EGI (-3)	0.000308	2.523527**
EGI (-4)	-0.00106	-3.31286**
FGI	-0.0008	-3.20669**
FGI (-1)	-0.00032	-2.34564***
FGI (-2)	-0.00096	-4.75636*
FGI (-3)	-0.0005	-3.45559*
FGI (-4)	-0.00048	-2.39787***
SGI	0.000734	3.498707*
SGI (-1)	0.001183	7.284208*
SGI (-2)	0.002267	3.903841*
SGI (-3)	0.000945	5.192447*
SGI (-4)	0.000634	3.777595*
C	-0.03224	-7.16*
R^2	0.94	-
D-W TEST	2.04	-
NORMALITY	0.35	-
HOMOSCEDASTICITY	0.30	-
ABSENCE OF SERIAL CORRELATION	0.35	-
F-Stat	5.69	-
Upper Bound	4.66	-
Lower Bound	3.65	-

Source: Computation using EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
GII= Gender Inequality Index; **EGI**= Economic Globalization Index;
SGI= Social Globalization Index; **FGI**= Financial Globalization Index

The F-statistic (5.69) for the entire model is greater than the upper bound (4.66) at one percent level of significance which establishes the long run relationship. The findings of the model reveal that improvement in EGI and FGI lead to reduction in gender inequality, while the SGI is found to increase gender inequality. The results establish the existence of a long run relationship between the gender inequality and globalization, that is, the variables cointegrate. Thus, the short run and long run ARDL model reveals the effect of globalization on gender inequality.

The model also satisfies the conditions of absence of heteroscedasticity and serial correlation as well as the condition of normality. The Durbin Watson test is 2.04 and the model explains 94 percent of variation in gender inequality. The equation can be written as:

$$GII = C(1)*GII(-1) + C(2)*GII(-2) + C(3)*GII(-3) + C(4)*GII(-4) + C(5)*EGI + C(6)*EGI(-1) + C(7)*EGI(-2) + C(8)*EGI(-3) + C(9)*EGI(-4) + C(10)*FGI + C(11)*FGI(-1) + C(12)*FGI(-2) + C(13)*FGI(-3) + C(14)*FGI(-4) + C(15)*SGI + C(16)*SGI(-1) + C(17)*SGI(-2) + C(18)*SGI(-3) + C(19)*SGI(-4) + C(20)\ldots\ldots\ldots..(2)$$

5.4.4 Empirical Analysis of the Impact of Globalization on Unemployment

This section examines the impact of globalization on employment, another aspect of socio-economic development. The empirical analysis is carried out using the ARDL models on unemployment. Globalization in terms of trade and capital flows increases economic integration and makes the local market more competitive. To survive in the competition, domestic industries improve product quality, bring about technological advancement and as a result employ more highly skilled workers. In the chain of effects, it also increases demand for unskilled workers in auxiliary activities. Thus, an increase in globalization creates new employment opportunities. Studies such as, Kazar and Amit (2016), Shuaib and Akpan (2015), Ukpere and Fleischer (2011), Mostert (2003), Kilic (2015), Okonkwo and Samimi (2014), Redzuan and Ray (2012), Barry (2010), and Aka (2006) report that globalization has reduced unemployment in developing countries. In recent times, there is an increasing global concern toward unemployment as an ill effect of globalization as asserted by Felbermayr, et al., (2011) and Helpman and Itskhoki (2010).

MODEL I   *UEMP_LF=* $\alpha + \beta_1 CGI + C + \varepsilon$ ……….. (1)

The ARDL (3, 0) model of unemployment is based on the lag values of the unemployment, and overall level globalization with the lag periods derived on the basis of AIC. The level of unemployment is posited in terms of the ratio of unemployment to total labour force. The first and third lags of the unemployment ratio are found to have negative influence on the current period values of the ratio. But the second lag of the variable is found to have a positive influence on the current period value of ratio. All the three lags of unemployment are significant at one percent. Thus, based on the Wald test it is established that the lag values of unemployment ratio influence its current period value.

Table: 5.11 ARDL Model I using Unemployment to Total Labour Force

as Dependent Variable

Variables	Coefficient	t-Statistic
UEMP_LF (-1)	-1.42427	-4.6226*
UEMP_LF (-2)	4.457043	4.955823*
UEMP_LF (-3)	-2.23801	-3.28678*
CGI	-0.00162	-1.74476***
C	0.426348	1.575932***
R^2	0.749812	-
D-W Test	2.13	-
NORMALITY	0.49	-
HOMOSCEDASTICITY	0.10	-
ABSENCE OF SERIAL CORRELATION	0.55	-
F-Stat	2.09	-
Upper Bound	4.16	-
Lower Bound	3.62	-

Source: Computation using EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
UEMP_LF= Unemployment to Total Labour Force; **CGI=** Composite Globalization Index

The overall level of globalization measured in terms of its composite index negatively affects the unemployment level at ten percent level of significance. The F-statistics (2.09) is less than the lower bound (3.62) at five percent level of significance which does not establish the long run relationship. Thus, there exists no long run cointegration between unemployment and globalization. Therefore, it is suggested to rely on the short run model i.e., the ARDL model. The model satisfies the condition of homoscedasticity and

normality, and the absence of serial correlation. The Durbin Watson test is 2.13 and the model explains 74 percent of variation in unemployment. The equation can be written as:

$$UEMP\_LF = C(1)*UEMP\_LF(-1) + C(2)*UEMP\_LF(-2) + C(3)*UEMP\_LF(-3) + C(4)*OGI + C(5) \dots\dots\dots\dots (2)$$

The first model on unemployment is based on the short-run analysis as the long run bound test does not establish long run co-integration between the index of globalization and unemployment ratio. It is noted that, in the short run the overall level of globalization has reduced unemployment.

MODEL II $UEMP\_LF = \alpha + \beta_1 T\_GDP + \beta_2 FGI + C + \varepsilon \dots\dots\dots (3)$

The second model of unemployment is based on the lag values of the unemployment and trade ratios and FGI, in which the lag period is based on the AIC. The results show that the first and third lags of unemployment ratio negatively influence the current period of unemployment. But the second lag of the unemployment ratio positively influences the current unemployment. The lags of unemployment are significant in influencing the current period of unemployment. The Trade to GDP ratio is found to positively affect the ratio of unemployment in its level, first and third lags at 0.05 and 0.10 levels of significance. But the trade ratio is insignificant in the second lag. However, based on the Wald test the trade ratio is significant in influencing the unemployment as the F- statistics is 4.30 and it is significant at five percent.

The Financial Globalization Index (FGI) in its level and fourth lags negatively influence the unemployment at five and ten percent. It positively affects the third lag at one percent. But it fails to significantly affect the unemployment at first and second lags. The F-statistics in Wald test is 7.64 and it reveals that all the lags have a statistically significant effect on unemployment at one percent. Thus, the short-run ARDL (3, 3, 4) reveals that the level of globalization has a negative effect on employment. The spillover effect of trade and capital flows results in job shifts among the migrants, deterioration of real wage rates in the race for competitive advantage, relocation of business to other countries. With a more globalized world financial crises also tends to travel faster resulting in increase in unemployment in the affected countries. These views are echoed in Yasmin and Khan (2005), Todaro and Smith (2006), Ogunrinola and Osabuohien (2010), Felbermayr, Prat, and Schmerer (2011), and Mike (2020).

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Table: 5.12 ARDL Model II using Unemployment to Total Labour Force as Dependent Variable

Variables	Coefficient	t-Statistic
UEMP_LF (-1)	-1.59893	-7.55665*
UEMP_LF (-2)	5.111853	8.19096*
UEMP_LF (-3)	-2.97129	-6.68687*
T_GDP	0.004606	1.776037***
T_GDP (-1)	-0.00248	-0.86802
T_GDP (-2)	0.006108	2.459573**
T_GDP (-3)	0.004939	2.244215**
FGI	-0.00156	-2.27839**
FGI (-1)	0.00103	1.292166
FGI (-2)	0.000914	1.126569
FGI (-3)	0.002333	3.444193*
FGI (-4)	-0.00135	-2.06757***
C	0.926646	4.218275*
R^2	0.95	-
D-W Test	2.06	-
NORMALITY	0.99	-
HOMOSCEDASTICITY	0.65	-
ABSENCE OF SERIAL CORRELATION	0.44	-
F-Stat	5.15	-
Upper Bound	3.87	-
Lower Bound	3.1	-

Source: Author's Calculation in EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
UEMP_LF= Unemployment to Total Labour Force; **T_GDP**= Trade to GDP;
FGI= Financial Globalization Index

The F-statistics (5.15) is greater than the upper bound (3.87) at 0.01 percent level of significance. Thus, the F-statistics is greater than the upper bound and there exists co-integration between globalization and unemployment in the long-run. The model satisfies the condition of homoscedasticity and normality, and the absence of serial correlation. The Durbin Watson test statistic is 2.06, suggesting absence of autocorrelation. The model explains 95 percent of variation in the unemployment ratio. The model II shows that the majority of the lags of the trade ratio and FGI have positive coefficients, which imply that they tend to increase the unemployment ratio, both, in the short-run and long-run. The equation can be written as:

$$UEMP\_LF = C(1)* UEMP\_LF (-1) + C(2)* UEMP\_LF (-2) + C(3)* UEMP\_LF (-3)$$
$$+ C(4)*T\_GDP + C(5)*T\_GDP(-1) + C(6)*T\_GDP(-2) +$$
$$C(7)*T\_GDP(-3) + C(8)*FGI+ C(9)*FGI(-1) + C(10)*FGI(-2) +$$
$$C(11)*FGI1(-3) + C(12)*FGI(-4) + C(13) \ldots\ldots\ldots\ldots\ldots\ldots.. (4)$$

5.4.5 Empirical Analysis of the Impact of Globalization on Income Inequality

In the 1950s, Simon Kuznets put forward the theory of non-linear relationship between inequality and development. Kuznets (1955) hypothesized that income inequality tended to increase initially, peak, and then fall as economies developed. With regard to the impact of globalization on inequality, studies can be traced to Papanek (1973), Chase-Dunn (1975), and Bornschier, Chase-Dunn and Rubinson (1978). These studies focused initially on income inequality through the channel of capital flow of globalization and found that globalization increased income inequality. Alderson and Neilson (2002) and Milanovic (2005), on the other hand, found that globalization, measured in terms of trade and capital flows, reduced income inequality over time.

Lawrence (1996), Cline (1998), Dollar and Kraay (2001), Dollar (2005) and Heshmati and Lee (2010) in their country-comparison studies, have found that FDI reduced poverty and income inequality. Spilimbergo, et al. (1999) and Firebaugh and Goesling (2004) conclude that globalization reduced income inequality in skill-abundant countries. In most of the literature, income inequality has been typically measured using the GINI index, proposed by Cardoso Gini. Recent literature also uses the Atkinson and Theil Index. Atkinson Index is a measure of inequality based on welfare proposed by Anthony Barnes Atkinson in 1970. A similar measure on inequality is the General Entropy Index proposed by Henri Theil.

In the recent times, there is an increasing concern that globalization has widened the gap between the rich and the poor and increased the income inequality in countries (Cornia and Sampsa, 2001; OECD, 2011; Dreher and Gaston, 2008; Mitra and Yemtsov, 2006; Lee, 2002; Maddison, 2001; Milanovic, 2001; Mazur, 2000; and UNDP, 1999). The present study seeks to gauge the impact of globalization on income inequality in India using the Gini index for the period 1991 to 2020. Globalization is measured in terms of its individual indicators as well as its indices developed in Chapter 4.

MODEL I $GINI = \alpha + \beta_1 EGI + \beta_2 FGI + C + \varepsilon$............................. (1)

The first model (1, 3, 2) is constructed using the lag values of the index of economic, financial globalization and GINI index, where the GINI index represents the income

inequality in India (Table 5.13). The present study has used the automatic lag selection based on the Akaike Information Criteria (AIC) in all the ARDL models on socio-economic development and globalization, using EViews. The first lag of the GINI index has a positive influence on its current period value. It implies that the previous year's GINI index value increased the value in the current year. This indicates an increase in inequality. The first and the third lag of the Economic Globalization Index (EGI) is found to have a negative influence on income inequality but the second lag of EGI has a positive influence on income inequality. The current period EGI is found to have insignificant effect on GINI. The Wald Test of EGI is statistically significant at one percent as the F-statistics is 9.74. This reveals that the EGI in all its lags is significant to be used in this model and it affects the GINI index.

Table: 5.13 ARDL Model I using GINI Index as Dependent Variable

Variables	Coefficient	t-Statistic
GINI (-1)	0.32	1.85***
EGI	-0.009	-0.18
EGI (-1)	-0.29	-5.29*
EGI (-2)	0.27	3.56*
EGI (-3)	-0.15	-2.39**
FGI	-0.069	-3.11*
FGI (-1)	-0.036	-1.52
FGI (-2)	-0.041	-1.52
C	24.45	3.87*
R^2	0.74	-
D-W TEST	1.82	-
NORMALITY	0.59	-
HOMOSCEDASTICITY	0.98	-
ABSENCE OF SERIAL CORRELATION	0.82	-
F-Stat	4.87	-
Upper Bound	3.87	-
Lower Bound	3.1	-

Source: Computation using EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
EGI= Economic Globalization Index; **FGI**= Financial Globalization Index

The current period FGI negatively influences the GINI. But the first lag and second lag of FGI do not significantly influence the GINI index. The Wald Test of FGI is significant at five percent as the F statistics is 4.14.   It reveals that the FGI in all its lags has an influence

on the GINI index as it rejects the null hypothesis of Wald Test. Thus, in this model it jointly reveals that the lag values of EGI and FGI have a significant effect on GINI index. In the long-run, the F-statistic (4.87) for Model I is also greater than the upper bound (3.87) at five percent level and it reveals that there exists a long run cointegration between the income inequality and globalization. The model is tested for the absence of serial correlation and heteroscedasticity, and for normal distribution. It explains 74 percent of variance in the GINI index, and the Durbin Watson test statistic is 1.82, suggesting absence of autocorrelation. The equation can be written as:

GINI = C(1)*GINI (-1) + C(2)*EGI + C(3)*EGI(-1) + C(4)*EGI(-2) + C(5)*EGI(-3) + C(6)*FGI + C(7)*FGI(-1) + C(8)*FGI(-2) + C(9)..........................(2)

MODEL II $GINI = \alpha + \beta_1 EGI + \beta_2 FGI + \beta_3 SGI + C + \varepsilon$...................... (3)

The second model (3, 3, 4, 3) on the GINI index is based on the lag values of the GINI index, EGI, FGI and SGI, with the lag period based on the AIC. The first lag of the GINI index is not found to influence the current period GINI. But, the second and third lag of GINI are found to negatively influence the current period GINI. However, based on the Wald Test all three lags are found to influence the current period GINI index as the F-statistics is 3.89 and it is significant at five percent.

The second model of income inequality is an extension of the first model as along with EGI and FGI the SGI has been used to see the influence on income inequality. The first, second and third lag values of EGI are found to statistically influence the GINI. The first and third lag values have a negative coefficient and the second lag has a positive coefficient, and both are statistically significant in their influence on the GINI index. The Wald test F-statistics is ten and significant at one percent level of significance.

The current and the first lag of FGI are not found to significantly affect the GINI but its second, third and fourth lags have statistically significant negative effects on the GINI. The SGI is found to be negatively significant in its current period and second lag values, but exhibits a positive and significant role in affecting the GINI in its third lag. The SGI is not statistically significant in its first lag. The Wald Test F-statistics (2.81) supports in explaining the SGI at ten percent level of significance.

Table: 5.14 ARDL Model II using GINI as Dependent Variable

Variables	Coefficient	t-Statistic
GINI (-1)	0.37	1.66
GINI (-2)	-0.80	-2.48**
GINI (-3)	-0.58	-2.88**
EGI	0.028	0.40
EGI (-1)	-0.38	-5.33*
EGI (-2)	0.35	3.68*
EGI (-3)	-0.46	-3.63*
FGI	-0.03	-1.12
FGI (-1)	-0.000018	-0.0006
FGI (-2)	-0.10	-2.00***
FGI (-3)	-0.11	-2.17***
FGI (-4)	-0.10	-2.33**
SGI	-0.26	-2.88**
SGI (-1)	-0.054	-0.71
SGI (-2)	-0.21	-2.74**
SGI (-3)	0.15	2.54**
C	73.50	3.80*
R^2	0.90	-
D-W Test	1.67	-
NORMALITY	0.70	-
HOMOSCEDASTICITY	0.29	-
ABSENCE OF SERIAL CORRELATION	0.14	-
F-Stat	2.95	-
Upper Bound	4.66	-
Lower Bound	3.65	-

Source: Computation using EViews
* Significant at 1% level; ** Significant at 5% level; *** Significant at 10% level
EGI= Economic Globalization Index**; FGI**= Financial Globalization Index;
SGI= Social Globalization index

Now, in the long run the F-statistics (2.95) is less than the lower bound (3.65) at one percent level of significance. Thus, income inequality and globalization are not found to co-integrate in the long run. It is therefore advised to rely on the short run model i.e., the ARDL model. With regard to the short run, globalization is found to affect income inequality. The model is tested for the absence of serial correlation and heteroscedasticity, and it is normally distributed. The Durbin Watson Test statistic is 1.67 and the model explains 90 percent of variation in the GINI index. The equation can be written as:

$$GINI = C(1)*GINI\ (-1) + C(2)*\ GINI(-2)+C(3)*\ GINI+ C(4)\ EGI + C(5)*EGI(-1) +$$
$$C(6)*EGI(-2) + C(7)*EGI(-3) + C(8)*FGI + C(9)*FGI(-1) + C(10)*FGI(-2)$$
$$+C(11)*FGI(-4)+ C(12)*SGI+C(13)*SGI(-1)+C(14)*SGI(-2)+C(15)*\ SGI(-3)$$
$$+C(16)\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(4)$$

The models of inequality reveal that it is fit for establishing short-run and long-run relationships between income inequality and most dimensions of globalization. The economic, financial and social dimensional indices of globalization have negative coefficients in most of their lags, which suggests that increase in these indicators exert a negative impact on the level of inequality in the context of, that is, globalization has reduced income inequality. Some studies, however, (Zhu and Trefler, 2001; Silvio, 2022) have shown that free trade between countries contributes to shifts in global production, job loss, economic and environmental damages, and deplorable working conditions and increases inequality and poverty.

It must be borne in mind that the findings in the case of India are related to the macro economy level picture that emerges from the kind of data employed. Also, the income inequality data doesn't reveal the inter and intra group disparities, or the quality of livelihood-means of different classes of population. It is common knowledge that the nature of employment has undergone change over the years with deepening privatization and globalization, as firms try to protect their margins and cut costs. It has led to contractualization of employment and temporary nature of jobs, robbing labour of security, both short term and long term. There are also reports of wage disparities between genders and between the organized and the unorganized sectors. Thus, it may be concluded that in the case of India, while income inequality has reduced over the years on opening up of the economy, there are several other evils it has raised which can be gauged through a more in-depth study of different income strata, along with examination of the qualitative aspects of livelihoods and standards of living.

5.4 ANTI-GLOBALIZATION TRACES ACROSS THE WORLD

Early literature on globalization posits that economies are moving toward a new paradigm of custom-made homogeneous products at low cost (Levitt, 1983). Held, McGrew, Goldblatt, and Perraton (1999) have identified three schools of thought of globalization namely, the hyper-globalist, the skeptics, and the transformationalist school of thought.

The hyper-globalist argues that globalization has resulted in more interconnectedness with the reduction of borders (Levitt, 1983; Taylor, 1994; and Ohmae, 1995). The hyper-globalist marks this age as the 'Truly Global Age' in the dominance of global capitalism (Tikly, 2001). Proponents such as Bhagwati (2004), Norberg (2003), and Ohmae (1995) highlight the conceptual changes brought by globalization and argue that the political boundaries disappear with the increase in globalization and this facilitates the flow of financial and business transactions. The role of the state becomes less plausible with the involvement of global international organizations such as the United Nations, WTO, IMF, World Bank, etc.

The Skeptical school of thought is the opposite of the hyper-globalist. The Skeptical approach questions the effectiveness of trading blocs (Tikly, 2001). Skeptics argue that the United Nations is an instrument for powerful nations and is designed to gain their political aims (Martell 2007). With the rise of globalist organizations, anti-globalization movements can be observed all over the world, which means that people are not comfortable with the idea of global governance (Kellner, 2002). The skeptics believe that powerful nations adopt the practices of internalization and regionalism, and implement neo-liberal policies in the name of globalization (Robinson, 2007; Fenelon and Hall, 2008). The Transformationalist school of thought posits globalization as a global transformation (Giddens, 1999; Held and McGrew, 2003). Globalization is considered to be the central driving force behind the reshaping of the world using social, political, and economic changes (Giddens, 1990; Scholte, 1993; Castells, 1996). Giddens (1996) posits that globalization is the powerful transformative force that is responsible for the massive change of the economies, societies, institutions and the orders of the economy.

The rise of early globalization in 1945 after the end of World War II was termed a liberal order age. The establishment of various international institutions such as the United Nations, GATT, World Bank, IMF, etc., took place in this liberal age. The focus of these organizations was to foster a common ground of development by maintaining peace and security. The international liberal order became the single dominant international order after the aftermath of the Cold War in 1990 (Amandi 2020).

Mearsheimer (2019) in his study defined order as "……. an organized group of international institutions that help govern the interactions among the member states."

Orders help the member states to deal with non-member states. An order can be of different forms of international economic institutions such as International Monetary Fund (IMF), Organization for Economic Co-operation and Development (OECD), and World Bank. It includes some of the international organizations such as North Atlantic Treaty Organization (NATO), the Nuclear Non-Proliferation Treaty (NPT), the Warsaw Pact. It also includes agreements to tackle environmental issues and multifaceted institutions such as the Paris Agreement to tackle climate change, the League of Nations, and United Nations (UN), and trade-related integration such as the European Union (EU), North American Free Trade Agreement (NAFTA).

Orders are indispensable as they manage interstate relations in a highly integrated world and they help the great power nations to manage the weaker states (Keohane, 1984 and Knight, 1992). Today the world is engaged in enormous economic activities and it leads to the development of international institutions to make them efficient. The interdependence is now limited to economic and financial affairs but it also includes the problems that are accompanied by such affairs such as environmental and health. Knight (1992) posits that the rules of the orders often work for the benefit of the developing economies and it also manages the developing economies in a way that suits the dominant economies interest.

The international orders don't last forever. With the end of the Cold War the Soviet Union collapsed in 1991, and the United States was established as the most powerful nation. The new international order i.e., the international liberal order is a different order from the Western order that existed in the Cold War era. The creation of an international liberal order involves three tasks. First, it is essential to expand universal membership in the web of institutions. Second, it is necessary to create an open and inclusive international economy than was the case in the era of the Cold War, so as to enable economic globalization. Third, it is crucial to spread liberal democracy. These three tasks are based on the theories of peace, institutionalism, economic interdependence and democratic peace (Mearsheimer, 2019).

With the creation of the international liberal order, it was essential that with time Russia and China were made part of the same as they were the most powerful states after the US. The goal was to turn them into liberal democracies by embedding them into many international institutions such as the NATO expansion to eastern Europe. In the wake of

global terrorism in 2001, the Middle East nations also gradually started turning towards liberal democracies.

The efforts of the US to involve China and Russia in international institutions succeeded with Russia Joining the IMF and World Bank in 1992, However, Russia did not join the WTO until 2012. China joined the IMF and World Bank in 1980 and the WTO in 2001. European integration started with the 1992 Maastricht Treaty and became stronger with the debut of the euro currency. The EU and NATO expanded into Eastern Europe even as Russia opposed such moves. The Oslo Accords was signed by Israel and Palestine to find a peaceful solution to their conflict. The UNSC won over Iraq in 1991 liberating Kuwait (Mearsheimer, 2019).

The EU adopted a common currency, and harmonized regional trade relations in 2000. The spread of the global financial crises in 2008 and the decline of the US hegemony gave way to the rise of the Chinese economy. China became a global giant and established its regional hegemony because of BRICS. However, the change in the liberal orders have increased the protest movements, trade wars between the countries, protectionism policies and also gave rise to new identity politics with the decline of political globalization. The decline of the liberal orders changed the form of economic openness to isolation of economies. This gave rise to anti-liberal activities across the Western World (Amandi, 2020). In the middle of 2000, the international liberal order faced some deadly consequences. Afghanistan and Taliban war, collapse of the Oslo Peace Accord, civil war in Yemen, the French and the Dutch rejecting the EU proposal to establish a constitution for Europe, Eurozone crises in 2009, the UK exit from the EU, Russia seizing Crimea from Ukraine, etc., were the events that put the liberal orders on a downhill. In 2023, the prolonged war between Russia and Ukraine resulted in the former occupying the territories of the latter. The negotiation between North Korea-Russia and Iran-Russia for the deal of weapons, and strengthening of ties with Iran and North Korea happened amid the warning by the Western world. Russia has isolated itself from the West amid the war between Russia and Ukraine. The rise of the international order often leads to increasing concern towards the national security and sovereignty (Mearsheimer, 2019).

The early signs of anti-globalization movements were witnessed in the protest against the WTO in Seattle in 1999 at the time of the Ministerial Conference, known as the Battle of

Seattle which was the first landmark movement against globalization. It was a protest against the specific WTO policies related to free trade and investments and neglect of human rights. It was the start of the voice of locals against globalization.

As the international liberal order progressed giving rise to liberal democracies outside the Western world, it was a backlash for the US in particular, as it started facing job insecurities and losses, rising income inequalities, trade deficits, etc. This led to the US adopting protectionist policies as is reflected in Trump's America First policy. Similarly, the UK exited the EU with concerns about an increase in population, job losses, etc. The increasing interconnectedness between countries also gave rise to global threats such as the trafficking of arms, narcotics, terrorism, and cyber security (Milner, 2009, Zurn, 2007). The increasing protectionism is visible in the US-led trade war with China and India, the replacement of NAFTA with USMCA, the US withdrawal from the Trans-Pacific Partnership (TPP), President Trump threatening to withdraw the US membership from WTO, Russia exercising its political power to conquer Ukraine over NATO (North Atlantic Treaty Organization) issue. The US withdrew from the Paris Agreement on climate change in 2017 during the presidency of Donald Trump. However, the US rejoined the Paris Agreement in 2020 with Joe Biden taking charge as the President.

These developments led Amandi (2020) to opine that there was a growing concern regarding who the real winners and losers of globalization were. The skepticism on globalization is not without paradoxes asserted by Rodrik, 2011, discontents asserted by Stiglitz, 2003, and complexities and contradictions asserted by Rosenau, 1997. In contrast to the closeness and interconnectivity, Acemoglu and Robinson (2012) argue that the increasing closeness has accounted for poverty and inequality. Cerny (2013) called these problems as paradoxes of liberalism. In the time of Trump's rule, the America First *mantra* was extended advancing the interest of white supremacists (Nye, 2017). Goldberg (2018) asserts how the rebirth of tribalism, populism, and nationalism has led to decline of liberalism and protectionism with the decline of American democracy. Similarly, there were protest movements in other countries such as post Arab Spring Revolution, mass protests in Latin America against the neoliberal model, and Spanish Indignados, etc., (Castro 2019).

The decline of liberalism led to the decline of economic globalization and multilateralism. In recent years globalization is being shaped through the means of geopolitics. The rise in geo-political issues is creating anti-globalization movements between nations. The developed countries are facing challenges from the emerging countries and similarly, the retaliatory measures taken by the developed countries are creating challenges for the emerging economies. The increasing practice of power politics by economic means is threatening globalization to go off track. For Instance, in order to soften the economic sanctions imposed by major developed and developing nations, China uses economic power to pursue geo-politics by means of trade, finance, and investment support to Russia, Sri Lanka, Pakistan, African and European countries, etc. The resistance of emerging economies against the ongoing wave of globalization is evident in a series of events. India reacted to Malaysia over the diplomatic comments of the Malaysian PM on India's New Citizenship Law for Kashmir by imposing a ban on the imports of Malaysian palm oil. The prolonged rift between India and Pakistan over the border issues forced India to ban trade with its neighboring country. Border tensions between the two major emerging countries, India and China, forced India to ban China's major 52 digital apps and boycott several Chinese products. Similarly, there has been a growing tension between India and the US over counter tariff imposition by both against each other.

Thus, it may be said that initially, globalization followed the route of *'Butterfly Effect'* propagated in the Chaos Theory (Alblooshi, 2020). However, the path of globalization of the countries was marked by many hiccups of socio-economic in nature which moved the world from anti-globalization to slowbalization. Slowbalization is the term that became popular after the global financial crisis of 2008, and was first used by Adjiedj Bakas in 2015. The slowdown in the pace of globalization induced Ian Goldin and Mike Mariathasen to coin the term *Butterfly Defect* which explained how the problems flowed from interdependence and made economic globalization more complex. In recent times, there has been a revival of bilateral and regional trade agreements between countries looking for new alignments based on the current and prospective geopolitical dynamics. Thus, globalization is a constantly evolving phenomenon in response to economic and geopolitical trends. As Rodrik (2009) argues, risk is an integral element of globalization and it is not dying, rather it is changing with different waves.

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 InfraNodus identifies the structure of the discourse using the network graph. The discourse is measured using three criteria; namely modularity (M), connected component (C), and Shannon entropy (E). Based on these criteria, four scores are identified namely, dispersed, diversified, focused, and biased to measure the level of biasness. The first score is dispersed, which implies high modularity (M > 0.65, C < 50 percent, E >= 1.5), and it shows that the topics present in discourse are highly connected. The second score is diversified, implying high modularity (0.6 >= M > 0.4, C < 50 percent, E >= 1.5), in some topics present in the discourse. The third score is focused implying medium modularity only in some perspectives (M > 0.4, C >= 0.5, and E > < 0.25 and 0.75) and in some perspectives the discourse is weakly presented. The last score, biased, implies (M < 0.2) absence of any detectable communities and shows that the discourse is biased.

Fig. 5.6 shows the text network graph of geo-politics and globalization using the Infranodus. It is found that the text network creates 162 nodes and 975 edges. The size of the nodes suggests the betweenness centrality, in other words, it implies the connectedness between each node. Colours are used to represent the contextual clusters and topics which are closely related. The most influential nodes are geopolitics, globalization, and China. The discourse is focused, which shows that the discourse is more influential in some perspectives, and in some, the discourse is weakly presented. The network structure indicates modularity (>0.4 for medium and >0.65 for high modularity) as 0.49, which implies a medium connection between the clusters, and the influence distribution is 40 percent.

The finding of the network graph (Fig. 5.6) reveals that *China* is the most prominent in *geopolitics* and *globalization*. This substantiates the discussion stated above that countries are adopting the practice of power politics by economic means is threatening *globalization* to go off track. Particularly *China* has been aggressive in using economic power to pursue *geo-politics* by means of trade, finance, and investment support to *Russia*, Sri Lanka,

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Pakistan, African and European countries, etc. The findings also show *Russia* and *North Korea* as important nodes in *geopolitics* and *globalization.*

Fig. 5.6 Text Network Graph of Geo-Economics

Source: InfraNodus

Fig. 5.7 shows the text network graph of anti-globalization using the Infranodus. It is found that the text network creates 208 nodes and 1132 edges. The size of the nodes suggests the betweenness centrality, in other words, it implies the connectedness between each node. Colours are used to represent the contextual clusters and topics which are closely related. The discourse is diverse, which shows that the discourse is more influential. The network structure indicates a high modularity of 0.51 (0.6>=M>0.4), and the connection between the clusters and the influence distribution is found to be 80 percent.

The findings of the network graph of anti-globalization (Fig.5.7) reveal interesting facts. It substantiates that there have been increasing *movements* against *economic globalization* in particular, on account of the *WTO policies*, which have facilitated increased *immigration*, and thereby caused *unemployment* in *developed* countries. The nodes of *unfair practices, withdrawal, trade deficits, retaliation, tension, protectionism, Brexit*, etc., are also identified as important elements of the *anti-globalization movements*. The network graph also identifies the *UK*, the *EU*, and *Japan*, and to some degree *NAFTA, USMCA, TPP*, as the prominent countries and integrations in the *anti-globalization movements.*

Fig. 5.7 Text Network Graph of Anti-Globalization

Source: InfraNodus

5.4.1. Ripple Effects of Globalization

Emerging economies, including India, are in the growing phase of globalization. While these countries are experiencing an accelerated pace of growth on account of their openness, it is equally true that they are caught up in the race of globalization even as they are yet to develop their domestic economies, particularly, in relation to the social sector. For instance, it is common knowledge that within the Indian economy there is a widening disparity of income, wealth, and opportunities between those sections of the society that have been able to partake in the favorable impact of globalization and those who have got marginalized in the process as they lack the basic requirements for growth such as nutrition and good health, education and skills, digital and financial capabilities, etc. On account of this emerging economies are experiencing the ill effects of globalization such as rising unemployment, inequalities, epidemics, environmental damages, and threats to biodiversity and culture, etc. This section briefly discusses the ripple effects of globalization faced by the economies:

Globalization and Population

Globalization encourages people to migrate for better opportunities such as high-quality education, better job prospects, access to different cultures, skill enhancement, and an increase in human capital. Both temporary and permanent immigration is a major concern of developed as well as developing countries due to its effect of increasing the population. A large number of students are found to prefer more English-speaking nations such as the US, UK, Australia, New Zealand, Canada, and Ireland. Countries with low population benefits and governments of such countries are liberalizing immigration rules and rules related to the working hours of students to ease the burden of their education loans, along with studies. Countries that experience an excessive rise in population due to globalization face problems such as poverty, unemployment, economic opportunities, human rights, political repressions, safety and security, and others (Croix, Mason, and Shigeyuki, 2002). For instance, there has been a heavy influx of people from Mexico, China, and India, etc., to the US which has been a major issue of contention for the latter. Similarly, immigration in the Western European countries particularly, the UK, from the weaker member countries

of the EU and influx of refugees from conflict regions such as Syria, Afghanistan, Iraq, Sudan, Ethiopia, Yemen, etc., have raised several problems for the UK.

Globalization and Workers

Globalization induces transnational corporations to move to countries where factors of production can be availed at cheaper costs, particularly, in developing countries. Reduced tariffs, trade barriers, and government subsidies, and availability of better facilities and favorable policies of government have shifted the firms' interest toward location advantage. Trade liberalization has increased the demand for skilled workers and has resulted in higher wages, thereby increasing the disparity with unskilled workers. Increased competition on account of globalization has resulted in closures and offshoring of businesses, and job losses. This was claimed by Sahoo (2010), Guthrie (2012), and Kiren and Awan (2018). The present study also, in its empirical analysis of the impact of globalization on employment, found that globalization has caused an increase in unemployment both in the short run as well as long run based on the ARDL technique.

Globalization and Inequality

The openness measures of globalization are creating opportunities for millions of populations within and across the borders of nations. At the same time, there has been an increasing concern arising about whether globalization increased or decreased inequality. The present study has highlighted a variety of research papers that find mixed results with regard to the impact of globalization on inequality. It is found that in some regions globalization has helped in reducing inequality by creating new job opportunities, whereas in some other regions, it has resulted in an increase in inequality.

According to the World Inequality Report 2018, the GINI index is the most used measure for inequality. The GINI index in the case of India shows movement within a moderate range of 32.5 to 35.2 for the years 1991 to 2020. This means that globalization has not had a very discernible impact on income inequality in India as the GINI index value is found to have fluctuated for the entire study period. In comparison, the GINI index value in the year 2020 is found to be much higher for China (38.2), the United States (41.5), Brazil (53.9), South Africa (63), etc.

The interconnectedness and increased capital flows and trade have resulted in the displacement of labour, cheap imports from abroad, and competitive disadvantages. This has led to heavy losses for domestic producers and increased the wage gap for workers in organized and unorganized sectors and between men and women. Studies such as Stiglitz (1998), Hurrell and Woods (1995), Meschi and Vivarelli (2009), Bergh and Nilsson (2010), and Jaumotte et al. (2013), asserted that trade openness increases income inequality as it widens the disparity. Trade openness would bring more technology from developed countries to developing countries and require more labour skill-intensive. As a result, technology upgradation induced by trade would shift the labour demand from unskilled to skilled, adversely affecting the large pool of unskilled labour typically found in highly populated developing countries.

Globalization and Social Unrest

Globalization has enabled easy movement of people between countries, often leading to conflict in the host country over employment opportunities, thereby increasing income inequality for its citizens. Likewise, the entry of foreign goods and businesses in the host countries often pushes the domestic firms out of business. The disadvantaged groups of people would oppose the leaders, groups, or political system. Such opposition could result in more violence when peaceful protests of the disadvantaged groups fail to bring solutions. Studies such as Duiker (2003) asserted that the violent opposition by the disadvantaged group weakens the political system and becomes unmanageable and uncontrollable. The government also find it difficult to navigate through the conflicting pressures of upholding domestic justice and equality, on the one hand, and maintaining openness of the economy in the globalized world. Further, Bothra and Maini (2021), claimed that in most developed countries, many terrorists enter on work visas to carry out terrorist acts.

Globalization and Currency Fluctuations

Economic and financial openness increases the country's requirement of foreign exchange in order to finance trade and investment. This exposes the country to the problem of fluctuations in exchange values. Currency depreciation makes imports costlier and leads to trade deficits, balance of payment problems and increase in fiscal burdens for developing

countries. developing countries also face the problem of inadequate international liquidity, thereby creating a persistent problem of balance of payment.

Globalization and Financial Crises

The risk attached to financial integration has received much attention in recent years. The vulnerability to financial crises originating in one country does not remain limited to that country only, rather it spreads far and wide to all countries that are financially integrated on account of globalization. Internal shocks such as the collapse of financial or capital markets, currency crises, exchange rate risks, recession, etc., spread to the connecting countries. The Great Depression of the 1930s, the Asian economic crises, the international debt crises involving Greece, Mexico, and other countries, and the global financial crises, affected major economies. When a financial crises builds up, the global outreach of risk capital which moves rapidly beyond one asset class to another and this cycle plays out in the economy. This forms bubbles in the asset prices which ultimately break on some triggers and create macro-economic instability that spreads to closely integrated countries. The government is not able to protect their economies from the global outreach of these crises (Wheeler, 2008).

Globalization and Environmental Damages

Globalization has increased the global flow of goods, people, and ideas. Along with the positive effects of globalization, there are some negative effects on the social and economic sectors of the economies. Beyond these, high negative externalities are borne by the environment casting uncertainties on the sustainability of growth induced by globalization. The primary result of globalization is that it opens the door to entering new markets for businesses and labour. However, increased industrial activities, urbanization, and transportation have increased environmental problems such as increased the carbon emissions, destruction of habitat, extinction of species, illegal depletion of forests, overfishing, over dependence on cash crops that destroy the quality of land, ocean acidification, environmental pollutions, ozone layer depletion, and biodiversity loss (Farooq et al. 2019). These factors lead to climate change and the resultant increase in natural calamities like severe droughts and floods, tsunamis, drastic changes in weather

patterns, and so on, and ultimately affect food and water security, and livelihoods, leading to social conflicts and wars.

Globalization and Cultural Loss

Aside from the positive interactions of cultural exchange, globalization is often regarded as a threat to cultural identity. The increasing homogenization of culture is changing the pattern of living, and people are adopting more Western culture. Globalization has contributed to increasing immigration, spreading businesses, and transnational corporations. This has led to cultural homogenization and loss of the sole identity of culture. The cultural traits are vanishing with irregular shifts in jobs especially the night shifts, changing patterns of food habits, and changing modes of language from regionalization to Westernization (Vinnet, 2012). Many developing countries are embracing the culture of the West, with the Western leaders looked up as community leaders. Muzzaffar (2002) asserts that global consumerism is forming a homogenization by replacing the South with Western cultures.

Globalization and Pandemics

In today's world interconnectedness is not limited to the increased flow of people, goods and services, ideas, and technologies but also the epidemics spread like wildfire and turn into pandemics. The global network is so intertwined that epidemics occurring in one country spread across the world. This was asserted by Christakos et al. (2005), Boerner and Severgnini (2014), Ricci et al. (2017), and Jedwab et al. (2019), and very well demonstrated in the recent Covid-19 pandemic. It may result in an adverse impact on the degree and extent of trade and businesses worldwide and induce revisit of policies toward globalization.

Globalization and Cyber Threats

Technology is the key element of globalization creating a world where nearly everything is connected through the internet. With the advancement of technology, the world is facing issues of security via the stealing of information. Cyber threats have become a major concern of all countries in many areas such as military, political, economic, and financial. Cyber-attack takes different forms such as viruses, malware, denial of service attack (DoS),

botnets, phishing emails, cyberstalking, identity theft, etc. It gives rise to social tensions such as data leakage, financial loss, identity loss, etc. A series of cyber-attacks in the past stand witness to this. The Stuxnet worm that attacked the Iranian nuclear program in 2010, and phishing emails in 2013 that stole passwords of Target Corporation and cost $200 million are some examples. Some of the ransomware that affected globally are the 2013 Cryptolocker which compromised around 5,00,000 computers, the 2014 Trojan Horse, the 2015 bashlite malware, 2016 MEMZ Trojan. The North Korean Wanna Cry ransomware attack was a major attack in May 2017 that infected 2,30,000 computers across 150 countries globally. It started from North Korea and affected the US, UK, Australia, and other countries among which Russia, Ukraine, India, and Taiwan were the most affected. Similar to Wanna Cry Ransom in 2017, Bad Rabbit, Petya, and Non-Petya also affected Ukraine, Russia, etc., with different programming systems. Huawei was banned by the United States, Canada, Australia, and New Zealand because of security concerns. The world is still grappling with the issue of how to tackle the problem of cyber-attacks.

Fig. 5.8 shows the text network graph of ripple effects of globalization using the InfraNodus. It is found that the text network creates 150 nodes and 630 edges. The size of the nodes suggests the betweenness centrality, in other words, it implies the connectedness between each node. Colours are used to represent the contextual clusters and topics which are closely related. The node of globalization is connected with most of the other nodes. The network structure indicates high modularity (0.6>=M>0.4) of 0.62, which implies that the discourse is diverse indicating high connection between the clusters, and the influence distribution is 80 percent.

The network graph (Fig 5.8) of ripple effects of globalization clearly brings out population, and financial risk as the major nodes followed by *currency depreciation, Asian economic crises, financial crises, exchange rates, internal shocks, risks, cyber threats, cyber-attacks, Iranian nuclear, wanna cry, phishing, botnets malware, poverty, unemployment, pandemics, cultural, immigrant, education, temporary,* and *vulnerability,* etc. The other important nodes include those identifying countries the *US,* the *UK, China, Australia, Ukraine, Russia, India, Mexico, Canada, New Zealand, European, and Taiwan.*

Fig. 5.8: Text Network on Ripple Effect of Globalization

Source: InfraNodus

5.5. CONCLUSION

The empirical analysis of the impact of globalization on the Indian economy, starting with the Granger causality test, suggests that both, globalization and GDP, Granger cause each other. In some cases, economic growth is found to Granger cause financial, political and social globalization, while economic, technological, and overall level of globalization are found to Granger cause economic growth. The Granger causality was also tested with the individual indicators of globalization. The results suggest uni-directional and bi-directional causality for different indicators of globalization-growth relationship.

The second level of empirical analysis involves regression analysis of the relationship between economic growth and globalization. It was found that models with GDP as the dependent variable were found to be more effective in terms of the coefficient values of

the explanatory variables than the models with TFP as dependent variable. The results are supported by many studies in the literature such as, Dreher (2006), Barry (2010), Ray (2012), Meraj (2013), Maqbool-ur-Rahman (2015), Antiquisa and Deluna (2014), Kilic (2015), Sehrawat and Giri (2016), and Hasan (2019).

The third analysis is related to trends and growth rates of the indicators of socio-economic development. Majority of the indicators, namely, HDI, GII, and GINI index, and those related to health, education, and employment have progressed tremendously over the study period. However, education in terms of the GER at the elementary, secondary and overall level of schooling is found to have decreased in the third decade. Similar, trend is observed in the case of the unemployment rate.

The next empirical analysis involves the effect of globalization on the socio-economic development of India using the ARDL models. The model analyzing gender inequality revealed that economic and financial globalization indices have led to reduction in gender inequality, while, the social globalization index is found to have increased gender inequality. Thus, there are mixed results with regard to the impact of globalization on gender equality. The second set of models involves the examination of globalization and education using government expenditure on education as percentage of GDP as the variable. It is found that globalization in terms of increased trade and financial globalization index has not exerted any positive effect on the education level. However, the education expenditure ratio has increased with the increase in FDI flows to India. The third set of ARDL models analyzed the effect of globalization on income inequality using the GINI index. It was found that income inequality has reduced in the case of India. The negative coefficients of the dimensional indices of globalization indicate decline in income inequality. The last set of models relate to globalization and unemployment. The composite index on globalization was found to reduce the unemployment rate in the short run. However, the trade and capital flows were found to increase unemployment in the long run.

The final analysis of the present research work relates to the use of text network analysis based on InfraNodus software. The findings of the analysis highlight the dominant countries, issues, and challenges of globalization and the strong interconnectedness of the economies. The network graphs also bring out the important clusters of connectedness

between globalization and geopolitics, and anti-globalization and its issues. The analysis concludes with the discussion on the ripple effects of globalization, ranging from population effects, inequalities, and social unrest to financial and exchange rate crises, pandemics, cyber-attacks, and environmental and cultural impacts.