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Globalization, International Trade and Economic Growth: An Empirical Investigation of Indian Economy

A Thesis submitted to the Delhi Technological University, Delhi in fulfilment of the requirements for the award of the degree of

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In

Discipline of Economics

By

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DECLARATION

I hereby declare that the thesis work entitled **"Globalization, International Trade and Economic Growth: An empirical Investigation of Indian Economy"** is an original work carried out by me under the supervision of **Prof. Nand Kumar**, Professor, Department of Humanities, Delhi Technological University, Delhi. This thesis has been prepared in conformity with the rules and regulations of the Delhi Technological University, Delhi. The research work presented and reported in the thesis has not been submitted either in part or full to any other university or institute for the award of any other degree or diploma.

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CERTIFICATE

This is to certify that the thesis entitled **"Globalization, International Trade and Economic Growth: An empirical Investigation of Indian Economy"** submitted by **Ms. Shikha Gupta** to the Delhi Technological University, Delhi for the award of the degree of **Doctor of Philosophy** in **Discipline of Economics** is a bona-fide record of original research work carried out by her under my supervision in accordance with the rules and regulations of the University. The results presented in this thesis have not been submitted, in part or full, to any University or Institute for the award of any degree or diploma.

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(SHIKHA GUPTA)

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List of abbreviations

Symbols	Description
ACD	Asia Cooperation Dialog
ADF	Augmented Dickey–Fuller
AEP	Act East Policy
AI	Artificial Intelligence
AIC	Akaike Information Criterion
API	Active Pharmaceutical Ingredients
ARDL	Autoregressive Distributed Lag
ARF	ASEAN Regional Forum
ASEAN	Association of South-East Asian Nations
BIC	Bayesian Information Criterion
BSEC	Black Sea Economic Cooperation Organisation
CPI	Consumer Price Index
CSGR	Centre for Study of Globalization and Regionalisation
DDS	Duty Drawback Scheme
DFIA	Duty-Free Import Authorization
DFM	Dynamic Factor Model
DHFM	Dynamic Hierarchical Factor Model
DOLS	Dynamic Ordinary Least Square
EAS	East Asia Summit
ELGH	Export-Led-Growth Hypothesis
EPCG	Export Promotional Capital Goods Scheme
EPZ	Export Processing Zones
EU	European Union
EXIM Policy	Export and Import Policy
FDI	Foreign Direct Investment
FE	Fixed Effect
FEVD	Forecast Error Variance Decomposition
FGLS	Feasible Generalized Least Squares
FOB	Free on Board
FTA	Free Trade Agreement
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GI	Globalization Index
GMM	Generalized Method of Moments
GNP	Gross National Income
GPML	Gamma Pseudo Maximum Likelihood
GVC	Global Value Chains
HMR	Helpman, Melitz and Rubinstein
IMF	International Monetary Fund

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IORA	Indian Ocean Rim Association
IRF	Impulse Response functions
KOF	Konjunkturforschungsstelle
LATC	Latin America and the Caribbean
LEI	Leading Economic Indicator
LPG	Liberalization, Privatization and Globalization
MCMC	Markov Chain Monte Carlo
MEIS	Merchandise Exports from India Scheme
MGC	Mekong Ganga Cooperation
MGI	Maastricht Globalization Index
MRT	Multilateral Resistance Term
NA	Northern Africa
NAFTA	North American Free Trade Agreement
NAM	North America
NBPML	Negative Binomial Pseudo Maximum Likelihood
NEP	New Economic Policy
NGI	New Globalization Index
NLS	Non-Linear Least Square
OLS	Ordinary Least square
PMI	Purchasing Managers Index
PPML	Pseudo-Passion Maximum Likelihood
RBI	Reserve Bank of India
RE	Random Effect
RSCI	Resilient Supply Chain Initiative
RTA	Regional Trade Arrangements
SAARC	South Asian Association for Regional Cooperation
SC	speed of convergence
SEIS	Services Exports from India Scheme
SSA	Sub-Saharan Africa
SST	Santos Silva and Tenreyro
TVPR	Time Varying Parameter Regression
UAE	United Arab Emirates
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
USA	United States of America
USD	US Dollar
VAR	Vector autoregressive
VECM	Vector Error Correction Model
WTO	World Trade Organization

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ABSTRACT

"Globalization is inevitable in the modern era". Its shadow can be seen in all the countries, be it developed, developing or underdeveloped. Though globalization is defined differently by different authors, it can be seen as the phenomenon by which economies interact with each other creating interdependence on each other. India officially announced globalization in the year 1991 with the New Economic Policy. Three decades since globalization brought enormous changes in the structure of the Indian economy and have also bolstered the growth of the economy. But can India call itself truly globalized? While globalization has been a contributor to India's growth, experiments with globalization suggests varied results. The main purpose of the study is to empirically understand the dynamics of globalization with respect to its extensity, intensity, velocity and effect for the Indian economy.

The study first tries to gauge the relationship between globalization, international trade and economic growth using Vector Error Correction Model and Dynamic Ordinary Least Square for a period of 1980-2015. Wald test and Toda-Yamamoto Granger causality follow in analysis to investigate the short-run and the long-run causality, respectively. The results of the analysis suggest a short-run and long run relationship and causality between international trade and economic growth. The short run and long run relationship between globalization and economic growth is found, though, any short run or long run causality between the two is not indicated. In order to assess the response path, variance decomposition and impulse response functions are created. Globalization has a negative effect and trade bears a positive effect on economic growth. However, contrary to the perception of New Growth Theory, increasing trade and globalization do not have an impact on the long-run economic growth. The novelty lies in using an augmented version of KoF Index is used to avoid the problem of simultaneity and more robust approach.

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The study further tries to gauge the impact of globalization on India's exports, analyzing data from 154 exporting destinations, which constitute over 95% of current trade share over 27 years (1991-2017). Poisson pseudo-maximum likelihood (PPML-Estimator) technique is used to determine the gravity model of trade. But, more important, is the analysis of India's distance quagmire. Based on this, there has been an attempt to highlight regionalization. The empirical evidence presented validates this view of Linder's Hypothesis. But analysis of speed and rate of convergence also points to an immense untapped trade potential with 102 countries—as India's globalization takes a broader nature.

As India steps in the fourth decade of globalization, one can look at the fruits of globalization more objectively. The relationship of globalization with growth is much more complex with economies opting for protectionism. Going ahead, the idea is to identify the pace of globalization in the Indian economy by capturing the portion of economic growth as explained by foreign factors. Leading economic indicators from India and top 21 trading partners of India, which account for more than one-third of India's trade, are used in a Dynamic Hierarchical Factor Model analysis, to understand the variations in the dynamics of the selected series and to estimate the factor induced domestic and foreign factor loadings. The results reveal that India's globalization has been withering away over time. The factor-induced domestic and foreign factor loadings are used in the Time-Varying estimations to trace the evidence of slowbalization in India. The models supplemented with stochastic volatility, helps in examining the structural changes in the economy. It is observed that the portion of growth explained by foreign factors is marginally increasing.

Very recently the spread of the COVID-19 has impacted every nook and corner of the globe. The crisis and the ensuing recession have led global leaders to focus inwards. There are raising concerns regarding the reversal and even death of globalization. Though the idea of globalization may face intense criticism for being responsible for the spread of the virus, some

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researchers think that pandemic like this invite more globally coordinated responses from the nations and with such high degree of interdependence among countries, going back to pre-globalization phase is not possible. The study uses text network algorithm to structure the narrative and uses the indicators from Elcano Global Presence Index and KoF Globalization index to validate the proposed hypothesis that in Indian economy, globalization is witnessing slowbalization than de-globalization.

CHAPTER 1- INTRODUCTION

1.1 Globalization

Globalization is not a new phenomenon. The world has been experiencing globalization since ages. It includes flows of goods and services across borders, international capital flows, reduction in tariffs and trade barriers, immigration, cultural transformation, and the spread of technology and knowledge beyond borders. "Global economy is like the Galactic pool table with billions of balls" as mentioned by Neil Irwin, explains the phenomenon of Globalization well (Hanley, 2020). Just like, over the pool table, the collision of balls has a surreal series of events leading to unpredictable and unstoppable outcomes, so is the integration of economies in the era of Globalization. The idea of Globalization is expressed in all the major languages but with varied dimensions and definitions. Globalization represents a common belief that economic, social, political and technological forces are increasingly moulding the world into a shared space where the change in one region of the world would have significant repercussions for the other parts of the world.

Globalization can be defined as "increased interconnectedness and interdependence of people and countries, and it is generally understood to include two interrelated elements: the opening of international borders to increasingly fast flows of goods, services, finance, people and ideas, and the changes in institutions; and policies at national and international levels that facilitate or promote such flows." Shangquan (2000) highlighted, "Economic globalization as the increasing interdependence of world economies as a result of the growing scale of cross-border trade of commodities and services, the flow of international capital and wide and rapid spread of technologies". Ougaard (2004) suggested that "Political globalization involves transformations in the relations between political processes and territorial states" and Dreher

(2006) defines "Social globalization as information flows, personal contacts, and cultural sharing across countries". The following theories further shed some light on the concept of Globalization with respect to various dimensions of it.

1.1.1 Theory of Liberalism

This theory is based on the assumption of humans to maximize their economic prosperity and political freedom. Liberalism can be seen as market-controlled leeway of modernization. Liberalism thrives on technological progression in areas of transportation and infrastructures, while it also endorses the establishment of legal arrangements to spread liberalism via markets worldwide. Mostly these ideas are derived from Economics, Legal Studies, Political Studies, etc., which has enabled the standardization in technical areas. The problem in liberalism lies in its core assumption of economic prosperity and political freedom, which undermines cultural heritage and history since globalization is not desired by everyone in their day to day lives. Another problem lies in its undermining of power that exists between states, cultures, ethnicity, economic classes, and sexes.

1.1.2 Theory of Political Realism

This theory indulges in the questions of power, national interest and solutions to skirmishes. Realists believe that the state is inherently self-centred and has to be kept in check by well-defined checks and balances. Some factions in this theory believe in collective opposition to one state's ambition of world dominance. In contrast, the other section believes that one dominant player acts as guardian of international laws to advance its interests while trying to contain conflicts. While Realists say that states are inherently different in power structures, the problem here lies that they focus majorly on power hierarchies, not on the cultural and economic scopes, production and consumption, and communications which remains mostly

apolitical. Another problem is undermining smaller players, private sector and regional and global institutions, as competition between states does not explain all inequalities.

1.1.3 Marxist Theory of Globalization

This theory is primarily focused on the Marxist model of production and reducing social exploitation due to unfair distribution. Marxists believe that globalization creates opportunities for people to conquer the world for profits and self-interest. Believers of this theory reject the above two ideas of liberalism and political realism as they legitimize abuse for global relations. Neo-Marxists and Neo-Gramscian talk about the struggle to resist capitalism as a norm around the world.

1.1.4 Theory of Constructivism

This theory is based on the behavioural activities and experiences of people with languages and how they interpret things, formed by the dimension of consciousness. Constructivists focus on the ways how people act and behave within society. The conversation leads to the formulation of ideas for the wider world, as they form a sense of belonging. They like to think of themselves as citizens of the world instead of class and religious characters. The problem with the theory is doesn't take into consideration the significance of economic and ecological factors in determining mental experience; they undermine inequalities and power hierarchies.

1.1.5 Post- modernism Theory of Globalization

In the era post-modernism, the structure of power is based on ideas, identities, and knowledge. Michel Foucault helps to understand the society in terms of information, as control structures and forms knowledge. The structures help to comprehend that what can and cannot be known in a given socio-historical context; this structure of knowledge is known as "rationalism". The modern rationalism emphasizes on economic growth and technological innovation.

1.1.6 Theory of Feminism

It is a social construction of a bridge between masculinity and femininity. This deals with the social status of women and uplifting them as in the history women were dominated by the men.

1.1.7 Theory of Transformationalism

This hypothesis was clarified by David Held, as per him, the word 'Globalization' signifies the expansion in the interconnection between political, monetary and culture over the globe, making a sharing stage for the world. The hyperglobalist contends that in the new age, where the man is progressively becoming accustomed to the worldwide economic activities as the global partnership and global government are essential to the general public.

1.1.8 Theory of Eclecticism

This theory draws the relevance of broad concept of globalization and does not consider any single theory rather a combination of relevant theories to gain deeper insights into the contemporary discourses.

The theories suggest the basis on which the phenomenon of Globalization is gauged. There is somewhat unexpectedly, no cogent globalization theory or even a comprehensive study of its essential characteristics, despite a large and expanding literature. In addition, few globalization studies include a coherent historical narrative that distinguishes between those transitory or immediate events and the developments that signify the advent of a new conjuncture; that is, the transformation of human societies' existence, form and prospects.

Post-1991, there were many hiccups like the Asian Financial crisis, the dot com bubble and the Russian debt default. Still, none ever invited the debate on the reversal of globalization, and it surpassed all. The Global Financial Crisis (GFC) 2008, however, was a turning point. The

GFC witnessed an economic setback leading to shadow protectionism in the form of regulations, trade agreements and government intervention.

As India steps into the fourth decade of globalization, we can look at the fruits of globalization more objectively. More important, with recent literature highlighting an attack on Thatcherism of the 1970s, it becomes even more critical to see whether the country was better off after it liberalized and globalized under extenuating circumstances in 1990s. Equally important is to look at the effect, globalization has had on the economic growth of the country. While there is no doubt that India has seen a phenomenal growth the post-globalization era, but how much of this effect has been due to globalization and how much of it is due to increase in domestic factors remains to be seen.

Trade, since times immemorial has been one of the critical features of the Indian economy. The country was not only part of the spice route, but also constituted an essential constituent of the silk route. Ever since ancient times, Indians are involved in trade across the world. Imperialism opened new avenues of commerce for the Indian economy. The Britishers channelized most of the efforts to their home country. It also introduced India to new markets. The opening up of the economy in 1991 and the new economic reforms contributed to a recalibration of the Indian economy with the world. The growth is attributed to many factors including, trade, openness, changes in policies etc. Foreign trade is an essential integration link of a nation with the rest of the world and has long-lasting ramifications on the growth of the country. India improved a lot concerning international trade for the last three decades.

But even if one is to take instances from Indian literature, despite myriad studies on openness and growth, the relationship established between international trade, globalization and growth requires continuous attention. This study thus presents a model to represent economic growth's relationship with globalization and trade for the Indian economy.

1.2 Periodization of Globalization

The shape of the present globalization relies on some historical story. Recent studies bring into question that globalization is a modern age phenomenon. The roots of globalization are closely integrated with international trade. For a long time, researchers have used international trade as the proxy to measure globalization. Globalization started with the silk road during the 1 BC-5 AD period when the trade of goods crossed borders. Though by this time it was mostly the luxury goods that travelled between Asian and Europe. The next phase of spice route (7-15 centuries) witnessed trade of spices spreading among Islamic countries followed by the age of discovery (15-18 century) when the European traders connected East and the west; and newer lands were discovered including America by Columbus. Though trade began to be global, the economists do not consider this period as that of true globalization. Despite embarking the age of discovery, the global economy was siloed and lopsided. The European empires built up global value chains, but mainly with those colonies that they control.

1.2.1 The first wave of globalization, 1870–1914

This wave witnessed falling transport costs and reductions in tariff barriers by a lot of countries. There was migration towards newly available land across. Trade, along with migration, brought in a large capital flow globally, accelerating the growth. Per capita incomes, which had risen by 0.5 per cent per year in the previous 50 years, rose by an annual average of 1.3 per cent. Countries that participated in it took benefits in a lot of aspects, and one of them was equality among other countries and also reducing poverty within its framework. Mass migration was a significant force equalizing separate economics and labour incomes in different countries.

1.2.2 The retreat into nationalism, 1914–45

Transportation costs further went down with advancement in technologies. However, trade

policy went into reverse "The twentieth century began with a highly efficient international monetary system that was destroyed in World War I, and its bungled recreation in the inter-war period brought on the great depression." This sense of protectionism globally drove down International trade, capital stock, poverty numbers dropped close to the ones in THE 1870s, and anti-immigrant sentiments emerged.

1.2.3 The second wave of globalization, 1945-80

Implications of the nationalistic orientations by countries were very sub-par, and an immense need for International trade was clear and so the actions were taken to make this happen. A partial reduction in barriers followed by a reduction in transportation costs made trade flows back in considerable motion. This wave witnessed a new pattern of trade where the more affluent countries specialized in manufacturing niched the gained productivity from agglomerated clusters.

1.2.4 The third wave of globalization (1980-)

One of the most encouraging aspects of the third wave is that a lot of developing countries flourished during this period, they had a substantial increase in exports of services as well. Clustering is still very much there, even within well-located countries. Location helps, but it is not an absolute necessity for a country's success in the global markets. Developing countries were ranked based on their trade value measured against their income level. Since 1980s the global integration of the developing countries has increased and had also got a competitive advantage in manufacturing and services. Post the Third Industrial Revolution, globalization had been on steroids. The third wave of globalization (1991 onwards) witnessed the era of Deep Globalization (1991-2008), de-globalization (2008- 2020). 1991- 2008 is also termed as the Golden Age of Globalization for the Indian economy. In the 2000s, global exports rose to about a quarter of global Gross Domestic Product (GDP). Post GFC 2008, the economies

started to opt for protectionism, which leads to a slower pace of globalization.

A new wave of globalization can be embarked from here, that is, globalization 4.0. The virtual world is this new frontier of globalization, via e-commerce, financial platforms, 3D printing and the Digital Economy. The question that stays over is anticipating the characteristics of globalization 4.0, will it be re-globalization or de-globalization? With a particular reference to the Indian economy, the concept is predominated by the phenomenon of slowbalization and regionalization. Slowbalization refers to the slow pace of Globalization (Bakas, 2015). The idea of slowbalization explains that globalization is not dying, but only the pace of globalization is slowed down, and regionalization explains that the integration of economies has become more regional than global. Regional groupings, in terms of trade and cooperation, took centre stage. The trends were already in motion before this pandemic and now are apocalyptic for globalization.

A reinforced system of worldwide collaboration is expected to quicken progress on shared difficulties and diminish strains among and inside nations. After the Second World War, pioneers cooperated to grow new institutional structures and administration systems to help construct a more steady and prosperous future. The world has changed significantly from that point forward, and because of the imperative difficulties of the 21st century, countries have to participate in such a cycle once more. Economies, organizations, social orders and governmental issues are being changed by innovative advances in such zones as human-made consciousness and AI, the web of things, self-sufficient vehicles, drones, accuracy medication and genomics, progressed materials, brilliant matrices, mechanical technology and colossal information. Interestingly some countries did not integrate firmly into the global industrial economy. Their commerce during the third wave has declined, trade flows dropped, per capita

incomes dipped as well. There are three views for the divergence of these countries from being globalizers, they are-

The "Join the Club" view that argues, inadequate education, corruption, poor infrastructure, high trade barriers, etc. are some of the reasons for weak globalizers not being able to harness their comparative advantage. This view says, as policies, education systems, infrastructure are improved, trade barriers are lowered then these countries will integrate into world markets.

"Geographic Disadvantage view" suggests that the countries which did not participate with the global manufacturers suffer from the disadvantages due to location, despite having good fundamental economic policies they have suffered. Due to inadequate locations, transportation costs are higher, even higher than tariffs on their productions, poor infrastructure further plummets transportation costs.

The "Missed the Boat" view consents the opinion propagated by the "Join the club" view that good policies could have helped these countries to enter into global manufacturing and services. Still, they missed the boat; it believes late-comers do not have a lot to offer.

To some extent every view is right, there is room for some of the countries to improve their policies and get involved in the world markets and the major cities of these countries forming the clusters required to thrive a chain for specific service. Still, it is also likely that the presence of some better clusters somewhere else means some of the countries have missed the boat. As cliche as it may sound, globalization, apart from portraying elements of a modern zeitgeist, also adds more meaning to the historical forces which are shaping the socio-political realities of the contemporary era. so, it is essential to perceive the correct idea of globalization

1.3 The Globalization Debate

Beyond a general understanding of globalization bringing about global interconnectedness, there is a significant disaccord as to how the notion of globalization is conceived. The three influential schools of thought can be classified as The *Hyper globalizers,* the *sceptics,* and the *transformationalists.* Let's proceed on to see a more ornate elucidation of these theses.

1.3.1 The Hyperglobalist View

Hyper-globalizers believe that globalization brings denationalization. According to them, globalization is creating polarization between winners and losers in the global economy. Meanwhile, Neo-Marxists and radicals opposed this view and favour globalization. Such a view of globalization often has a financial impetus, and in an unusual way, which celebrates the rise of world markets, and thus, the goal of global competition for the causes of human development. During this time, many hyper-globalizers share the belief that international economic trade creates new styles of a system that replaces, or may eventually return traditional nations. They conclude that globalization is mainly an economic phenomenon, that there is today an increasingly interconnected global economy; that the requirements of world capital impose a neoliberal economic discipline on all defined policies of governments is no longer the 'art of the possible' but rather the 'sound economic management' practise.

1.3.2 The Sceptics view

The sceptics argue that globalization is a myth and equate it primarily with the perfectly integrated global market. They acknowledge the inequality and hierarchy in the world economy. They claim that globalization benefits west countries. Unlike the hyper-globalizers, the sceptics view globalization as a phenomenon that abides 'the law of one price'. Their view of internationalization of world economies- involving interactions between different free

states- is, therefore, fundamentally different from the hyper-globalizers' perspective as it puts down any possibility to achieve a perfectly integrated global market. Based on such economistic conceptions of globalization, the Sceptics claim that the trends, in which economic activities are now being carried out, point out regionalization instead of globalization, which remains an exaggerated myth. The theory entrusts the national governments with a critical role in regulating the forces of integration and economic liberalization- "the regionalized enduring power" which cannot be undermined. Globalization and regionalization are viewed as contradictory tendencies. Sceptical thesis not only disowns internationalization as an architect of global economic relations but it also acknowledges the pattern of inequalities and hierarchy in world economy associated with it which can instead breed in the spirit of fundamentalism and aggressive nationalism than paving the way for the emergence of a 'global civilization' as postulated by the hyper-globalizers.

1.3.3 Transformationalist View of globalization

According to the transformationalist view of globalization policies, is rapidly shaping the modern world in terms of culture and global institutions. Contrary to the hyperglobalist thesis, the transformationalist thesis suggests that the cultural exchange between first and third World nations is a two-way process. Globalization is thus revered for being a transformative Force which can alter the world order. However, transformationalist believe that the extent of globalization is far from being uniform across the globe. Globalization has integrated communities of different hierarchy and status. The differences of the first world and third world are fading in a new world order with the traditional pyramid analogy of the world being altered into a new three-tier arrangement. The core of the transformationalist thesis believes that the power and authority of the national governments are undergoing a paradigm shift due to contemporary Globalization. Countries are getting more intertwined into an international or a

centralized order instead of local autonomy; these institutions connect the future of all the nations. According to the transformationalists, globalization is also associated with non-territorial Institutions like MNCs. Various governments are coming up with strategies to thrive in a globalized world and are also building up cooperative systems for new international Regimes.

1.4 India's policy framework

Before Independence, India was a significant market for British exports India, as a newly independent country, had to import equipment and machinery that could not be manufactured domestically, in order to create new production capacity and build infrastructure, known as developmental imports.

Independent India in the late 1940s and early 1950s was an agrarian economy with the anticipation that the industries would boost the growth of the economy in the coming years. However, there was a constant perception that industries need to protect from foreign competition. With the focus on industrialization from the second five-year plan onwards, there was an increase in the demand for imports of capital and intermediate goods, which led to a balance of payment crisis in the mid-1950s. Inward looking development strategy, in particular, import substitution strategy was adopted to restrict the imports by raising tariffs and licensing imports. This later proved detrimental to the growth of the economy and exports underperformed and current account deficits incurred. A number of ad-hoc export incentive schemes were adopted over the years. In 1966, India faced high inflation and large government budget deficits. The domestic industries were restricted by the licensing system. India has been a leading proponent of the inward-looking strategy of development (strategy in which trade is biased in favour of production for the domestic market over the export market), became the glaring example of how a developing country with a tremendous economic potential submerges

under massive regulations and controls and thereby creates a rent-seeking society in the name of self-sufficiency and development (Hossain, 2000). In the 1970s, there was a major policy shift from import substitution to export orientation. Though, most developed economies started trade liberalization by 1960s and 1970s, most developing countries, even after becoming signatories to the GATT agreements, resisted the process of the opening up trade sector. Most of the developing nations moved towards trade openness after the 1980s. The inward-looking strategy in India was detrimental to economic growth rather than making her economically self-reliant. Indian economy witnessed high external debts, lower foreign exchange reserves, the balance of payment issues, particularly the current account deficit, fiscal imbalance and high inflation levels.

During the 1970s and 1980s, the primary thrust of the Indian trade policy was import liberalization along with the export promotion. This was because, during this period, prices of imported goods were rising much faster and foreign markets for Indian goods were depressed, resulting in huge adverse balance of payments from 1979-80 onwards. In fulfilling the long outstanding demand of the importing and exporting community and more stable policy, in March 1985 government announced the first three-yearly Import-Export Policies in pursuance of the "objective of bringing continuity and stability in the import and export policy". In this phase, government continued with its earlier policy of import liberalization. Through the adoption of all these measures, the government hoped to increase the foreign exchange reserves.

The BOP crisis led India to shift to an open and liberal economy in a gradual fashion since then. A number of researchers tried to explain the reasons behind such a dramatic shift. The primary push factor of the policy change was, of course, the BOP crisis. Though the BOP problems were present in before 1991 also, the situation worsened during 1991 with steep fall

in foreign exchange reserves (to about $1 billion which was equal to India's two weeks of imports at that time), high inflation (more than 12%), and high domestic and foreign debts (Joshi and Little, 1997). External shocks in the form of increased oil prices in 1990 also played a role in pushing the crisis. India's then restricted trade policy or a kind of trade isolation was adding to the problems. The globalization process in India started with the initiation of the New Economic Policy (NEP) in 1991, which marked the end of the era of Nehruvian project of planning for development. Policy-initiated India's formal exposure to the global world is introducing changes in the trade, monetary, fiscal, financial, and budgetary policy reforms. Liberalization, Privatization and Globalization (LPG) were the central theme of the NEP.

Industrial policy reform removed barriers to entry for new firms and limits on the size of growth of the existing firms. Investment decisions no longer depended upon government approval. However, the removal of barriers to entry and the absence of state intervention in itself was not sufficient for restructuring in the industrial sector. Recent developments in India suggest that acquisitions, takeovers and mergers in the industrial sector have facilitated large corporate houses to capture a preponderant market share. The rapid liberalization of the import regime which dismantled import licensing and slashed customs duties, except in the sphere of consumer goods, might have forced a de-industrialization in some sectors, especially capital goods.

New Trade Policy, announced in July 1991, aimed at export promotion and import liberalization by providing export incentives, eliminating substantial volume of import licensing etc. trade as a proportion of GDP improved after the trade policy reforms. The comparative assessment of the trade data suggests an improvement in the average growth rates of exports and imports in the 1990s as compared to 1980s both in absolute terms and in percentages. However, notable improvements took place during the first half of the 1990s. The

robust growth of trade (both exports and imports) of India during the period is generally attributed to the growth of world trade and the sharp depreciation of the real exchange rate. The global slowdown in the trade of the last quarter of the 1990s was not visible in India's receipts of invisible. Instead, during the period, the services trade emerged as an essential source of foreign exchange earnings. Significant changes introduced under New Trade Policy were the removal of Quantitative restrictions and discriminatory controls, restricting licensing regulations only on the small negative list, the introduction of trade account and current account convertibility, rationalization of tariff structure and reduction of import duties. A fundamental feature of this policy was freedom in the field of foreign trade. Restrictions on the import of raw materials and capital goods were relaxed. Protection to domestic industries was available only through tariffs. Import of second-hand capital goods was also allowed for twenty specified sectors including printing, garments, textiles, leather manufacturing, rubber and canvas footwear, sports goods, electric lamps electronic components, packaging materials, forged tools, oil field services, writing instruments and seafood. Exporters were entitled to import capital goods at concessional rate of duty under the "Export Promotional Capital Goods (EPCG) scheme".

Government of India introduced Export and Import (EXIM) Policy on April 1, 1992, for a duration of five years. A deliberate effort was made by EXIM Policy 1992-97 to abolish different protectionist and regulatory policies and accelerate India's shift to a globally focused economy. The 1997-2002 EXIM Policy streamlined the process for importing exports by halving the paperwork and reducing the interface between the Director-General of Foreign Trade and the exporters. The policy proposed to establish a framework for the Globalization of the Indian Economy to accelerate the economy to a high level of economic activity by marketing it as a vibrant, globally market-oriented economy and to reap full benefits from the expansion of global market opportunities. The strategy was designed to liberalize imports and

improve exports through the implementation of stability and continuity, the abolition of permits, quantitative limitations and other regulatory and discretionary controls. All products could be freely imported or exported except those falling under the negative list. Export Promotion Capital Goods (EPCG) scheme was announced with reduced duty on imported capital goods from 15 per cent to 10 per cent. The whole idea was to enable the exporters to concentrate on the manufacturing of the goods and their marketing globally.

Since the late 1990s, the government of India has entered into a number of Regional Trade Arrangements (RTAs) to remove the burden of remaining controls and disincentives for export, in 2005 the GOI decided to introduce "special economic zones. There was an acceleration in the anti-dumping policies. Trade reforms were not the only dimension of the economic reforms; these were complemented with financial reforms to improve the financial system, Foreign Direct Investment (FDI) related reforms, liberalization, tax reforms and simplification of the export and the import procedures, that made export producers more competitive. The spectacular growth of IT exports of services was the most rapid and most visible change in India’s position.

The IT industry began developing in India in the late l980s. It rapidly became a prominent symbol of India's emergence into the world economy much attributed to the telecom reforms (creating virtual infrastructure) and focus on the education policies (creating skilled human resource). Thus, India's integration into the world economy in was much more significant than had been the case in earlier years. As part of the annual EXIM Policy,1988, the government freed a large number of consumer goods from import restrictions, while liberalizing all major export promotion schemes. The EXIM Policy 1999-2000 removed physical control on imports and released more items from the restricted list and licensing requirements. This EXIM policy 2000-2001 launched sector-specific reforms and a significant rationalization in the export

promotion schemes. Setting up of two Special Economic Zones (SEZs), Positra and Nanguenery in Gujarat and Tamilnadu were announced by the government along with the conversion of some Export Processing Zones (EPZs) to SEZs. These SEZs enjoyed the benefit of 100 per cent FDI. Apart from export promotion, this policy also announced a few import liberalizations measures. Accordingly, this policy lifted quantitative restrictions on 714 commodity used items which could now be freely imported.

EXIM-Policy (2001-2002) removed the process of restrictions on the remaining 715 items. However, the import of agricultural products like wheat, rice, maize, copra and coconut oil and petroleum products were placed in the category of state trading. EXIM-Policy (2002-2007) included institutional, infrastructural and fiscal measures intended to promote exports which are conducive to the economic development of the country. With the objectives of sustained economic growth and sustained growth in exports, state governments were encouraged to participate in pushing up exports with financial assistance under the Market Access Initiative Scheme (MAIS). Special focus was announced for cottage and handicraft sector to make them export competitive. By implementing duty-free import facilities for service sector units with minimum foreign exchange earnings of Rs. 10 lakhs, the EXIM Policy (2003-04) offered a significant thrust to export services.

Furthermore, the Mini EXIM Policy (January 2004) aimed to improve gem and jewellery exports, promote tourism and make energy generation cheaper. Foreign Trade Policy (2004-09) aimed at finding an answer to the developmental needs of the country and rooted in the belief that trade is not an end itself, this policy aimed at unshackling controls and creating a milieu of thrust and transparency conducive for entrepreneurship to thrive. The main objective of this policy was to double India's percentage share of global merchandise trade by 2009 and to serve as an effective instrument for economic growth with a focus on job creation.

Foreign Trade Policy (2009-2014) focused on labour-intensive sectors. Support for Green Technology products, manufacturing in domestic markets, infrastructural development in the agricultural industry, simplifying the procedures of import and export and E enabled transmission of foreign exchange were the few initiatives of this policy.

The Advance Authorization Scheme (AAS) allowed the duty-free import of the inputs needed for the manufacture of the export product, along with the fuel, oil, catalyst, etc. Duty-Free Import Authorization (DFIA) has allowed the transfer, once the export is done, of the authorization or inputs imported. The Duty Drawback Scheme (DDS) permitted reimbursement of customs duty and excise duty at a specified percentage of the Free on Board (FOB) value of the exports on the inputs used in the production of the export product.

The Foreign Trade policy (2015-2020) was planned to make India an efficient partner in global trade by 2020, to increase domestic products' global competitiveness and to align the Indian Tariff System with the long-term commitment of the World Trade Organization. The goal of this policy was to improve India's exports through the 'Make in India' and 'Digital India' projects of the central government.

Two schemes were implemented under this policy: The Merchandise Exports from India Scheme (MEIS) and the Services Exports from India Scheme (SEIS). The MEIS goal is to offset infrastructural inefficiencies and associated costs related to the export of goods/products manufactured/produced in India, in particular those with a high export intensity, jobs potential and thus an increase in the competitiveness of India's exports. SEIS is intended to increase the export volume of registered services.

Neighborhood First Policy seeks to strengthen relations with its immediate neighbours and the island states of the Indian Ocean. Via a holistic approach, it achieves diverse objectives. With India entering into Memorandums of Understanding (MoU) with members of the South Asian

Association for Regional Cooperation (SAARC) for cooperation in the areas of exchange, infrastructure, trade relations and transit facilities, connectivity is a significant aspect of this strategy.

India's Look East Policy has strengthened its monetary, political, assurance and security in the course of twenty years. The rest of Asia is connected to civilization. India, to deal with the worldwide financial crisis, however, in deepening its ties with the rest of the world, it can become even more consistent and proficient. Asia, while improving its capacities to meet its challenges in terms of growth. The policy of the Look East in the post-Cold War era, emerged as India's main foreign policy initiative. The appropriate hypothesis of The Look East approach is that India must discover its predetermination bit by bit restricting itself with its fate with Asian accomplices and the remainder of the world and that the future and monetary interests of India are ideally serviced by greater assembly with Southeast Asia and the East. Look East approach was an endeavour to fashion profound monetary coordination with its eastern neighbours. The commitment with the Association of South-East Asian Nations (ASEAN) is the acknowledgement for the same.

As Prime Minister Manmohan Singh stated, the Look East arrangement is "not simply an outer monetary approach; it is likewise a vital move in India's vision of the world and India's position in the worldwide economy." The implementation of the strategy is based on the Indian government's obligation to enforce the strategy's proposed plans and tasks and to include the North-eastern states in this approach. There has been considerable progress in increasing monetary and vital commitment to the rest of Asia for almost twenty years since India began its Look East Policy (LEP). India is presently an individual from the Eastern Asian Summit (EAS) with 16 nations, trailed by ten agents from the ASEAN), Japan, China, Australia, the Republic of Korea and New Zealand.

The Act East Policy got underway by Prime Minister Narendra Modi at the East Asia Summit in Myanmar in November 2014. India's Act East Policy centres around the all-encompassing neighbourhood in the Asia-Pacific region. The strategy has increased political, economic and social measurements, including the foundation of institutional instruments for discourse and participation. The main aim of "Act East Policy" (AEP) is to advance economic involvement, social ties and create a vital relationship with nations in the Asia-Pacific area. AEP gives an interface between North East India and the ASEAN district. A portion of the significant tasks incorporate Kaladan Multi-modular Transit Transport Project, the India Myanmar-Thailand Trilateral Highway Project, Rhytidid Road Project, Border Hats, and so forth Apart from ASEAN, ASEAN Regional Forum (ARF) and East Asia Summit (EAS), BIMSTEC, Asia Cooperation Dialog (ACD), Mekong Ganga Cooperation (MGC) and Indian Ocean Rim Association (IORA). Closer participation in fighting psychological warfare, teaming up for harmony and steadiness in the area and advancement of oceanic security dependent on global standards and laws are being sought after. The Kaladan Multi-Modal Transit Transport Project undertaking, among India and Myanmar, admittance to the ocean ports in Bangladesh that would interface the North East to South-East Asian nations were likewise a piece of this arrangement.

The concerns and challenges faced were better road connectivity that need not lead to improved trade and economic development, the better network can advance fair exchange, yet also prop up illegal exchange of drugs and human trafficking. All nations of the locale, aside from China, are reliant on outside financing or are needed to distribute critical extent of their financial plans for these undertakings, which is an intense assignment. India must keep on zeroing in on further fortifying cooperation with ASEAN countries and others. Accomplices must attempt to advance monetary restoration, look for crucial collaboration to battle illegal intimidation, and improve sea security and guard participation. Sheer force, for example, Buddhism, the travel

industry, individuals to-individuals contacts, and social binds with the district must keep on being bridled. Significant areas like innovation, nonmilitary personnel atomic participation, safeguard, and development should be given need. Persistent commitment with China also is essential to growing participation, especially on the monetary front.

To improve our relationship with western countries, PM Narendra Modi Ji initiated the *Link west policy* with the aim to trade with West Asian Nations. Although with respect to the geographical area, link west policy covers the whole of the Persian Gulf, it mainly focuses on countries such as Israel, Iran and other Arabian Gulf countries. To improve our economy, the Middle East was and is an increasingly important factor, both as a source for fuel imports and Indian labour and remittances. The Middle East region supplies nearly two-thirds of India's total oil import, trade with countries such as United Arab Emirates (UAE) and other Arab states of the Persian Gulf has also increased in recent times. Saudi Arabia, Iran and Qatar have all been vital suppliers of hydrocarbon related products. Since the oil boom of the mid-1970s, the number of Indians living and dealing in Arab Gulf states (Saudi Arabia, Kuwait, Qatar, Bahrain, Oman and therefore, the UAE has proliferated. The majority are from states like Andhra Pradesh, Tamil Nadu and Kerala. Some found employment in white-collar jobs, but the majority (70%) work in the low wage, low skilled sectors, like construction.

The sheer density and size of contemporary economic, social and political activity tend to make territorial modes of politics increasingly impotent for many of those engaged in the debate about globalization and its implications. Globalization raises the issue of whether global and regional patterns of entanglement are replacing global ones.

1.5 Motivation of the study

The simple definition of Globalization which refers to the widening, deepening and Speeding up of global interconnectedness needs a further illustration. Globalization is referred to as a

process of transformations, how the interconnection is being intensified gives the idea about globalization. Comparing and contrasting the novel features of globalization requires the development of an analytical framework. The four Spatio-temporal dimensions are one analytical tool to differentiate forms of globalization - extensity, intensity, velocity and impact propensity (Held et. al 1999). Operationalizing these indicators helps in quick identification and comparison of the patterns in globalization. In identifying what exactly is global about globalization, the study aims to determine the extensity of the worldwide integration, that is, how much of the economic, social and political activities from one part of the globe, influence the other parts of the world; the intensity of the global connectedness to know the magnitude and the pattern of the interactions among the nations; the velocity of the international interactions to understand the potential speed of international diffusion of goods and services and ideas; and finally, the globalization effect for Indian economy.

Researchers are anticipating different opinions on globalization, while a few anticipate the death of Globalization, others believe the wings of globalization will be clipped, but it will not die (Huaxia, 2020; Hasan, 2020). The end of globalization is anticipated because it was already strained to the breaking point post-GFC; secondly, it catalyzed the spread of pandemic because of the liberal travel and trade and lastly the failure of internationalism in the face of the crisis. The recent trends in Globalization are exhibiting a different picture. Manoj Joshi (2020) quotes *The Economist* (July, 2019) that "globalization is becoming regionalization." He reveals the patterns of supply chain fragmentation in three industries. As per him, the textile sector is globally footloose, the automobile industry is forming regional hubs, and the electronics industry is majorly based in china, suggesting evolution of the trend of 'near-shoring' or 'reshoring' of supply chains.

De-globalization of the world economy refers to a phase of uncoupling. Regional markets have been more relevant than global ones since GFC and have also marked the slow pace of global integration. The last decade was already witnessing an acceleration in protectionism as visible with 'America first', "Make in India' campaigns. With this pandemic, the situations got worse. Global nations, instead of coordinating to find a solution together, are handling the cases individually. Global trade has dropped drastically by 27 % in the first two quarters of 2020 (IMF, 2020); however, it has recovered slightly in the third quarter as per the United Nations Conference on Trade and Development (UNCTAD). Commodity prices of crude oil, agricultural raw material, minerals and metals also dipped with the fall in the global trade.

Referring to his books "The Butterfly Defect" and "Age of Discovery," Ian Goldin (2020) re-examines the pros and cons of Globalization and believes that the pandemic may alter the essence of Globalization. Still, it will not bring an end to Globalization. Falcone (2020) is of the same view that slowbalization has increased in the pandemic. Travel and trade movements will be back after the pandemic is over, and further international movements across national boundaries will accelerate Globalization. Goldin also related outsourcing, distribution time, customization and protectionism with the fracturing of demand chains and supply chains. Globalization may have slowed in some countries, but its centre of gravity would move to Asia. Smith and Dumienski (2020) suggest that unlike in the case of past epidemics, there is now the technological capabilities to purchase goods and services directly from suppliers across the globe.

Laura Clarke (2020) in one of her speeches, mentions a Mckinsey report claiming that in Asian countries, 60% of total trade has been regional and "Asia-for-Asia" supply chains existed in the pre-pandemic period. Although global trade shall always be instrumental for the growth of developing economies, COVID-19 may help reinvigorate efforts to improve the resilience

of the supply chain, strengthen the depth of trade ties and, through regionalization, promote broader cooperation between trading partners. With countries developing effective and flexible supply chains with neighbouring nations, regionalization may be the key to minimize economic shocks by reducing the chance of over-dependence on trading with the world's largest developed economies. The current pandemic has led the economies to adopt inward-looking policies.

The main objective of the study is to understand the dynamics of globalization. The relationship between globalization, international trade and economic growth is established. Further, the impact of globalization on the exports from India is observed, which reflects the presence of regionalization and potential too in the geographically closer economies. Further an effort is made to trace the evidences of slowbalization in Indian economy using leading economic indicators. The underlying assumption is that globalization's impact on economic growth is slowing, and, consequently, this study intends to measure the proportion of growth explained by supranational variables as compared to the domestic variables. Globalization is measured via its impact on the focal economy suggested by the domestic macro-economic indicators and a set of foreign indicators that sustain the statistical viability of the model and contain meaningful information. The study hence also tries to investigate the intraregional connections vs extra-regional connections of the economies. Going ahead to the time-varying dynamics of globalization with the economic growth, it is estimated by analyzing the portion of growth explained by foreign factors and domestic factors. It is observed that the time-varying coefficients of the foreign factors have been increasing but at a marginal rate since the global financial crisis 2008. The results provide evidence for a slower pace of globalization and hence indicating slowbalization. The main challenge is to model the data series to produce timely and robust forecasts suing macroeconomic indicators as they are subject to rapid structural change exhibiting possibility of the structural break and policy changes. (Liu et al. 2012; Maier 2011).

1.6 Statements presented for Defence

i. Relationship between economic growth, globalization and international trade is suggested to have a short run positive relationship. However, no evidence of a positive long-run relationship found.

ii. The impact of globalization on exports is positive. However, the regional integration rather than global integration of economies is reflected in India's case.

iii. Presented method fits the design of a dynamic hierarchical factor model to suit the structure of the data and produce a set-up for interpretation of the results.

iv. The portion of future growth explained by foreign indicators relative to domestic ones is increasing marginally for the Indian economy, indicating slowbalization.

v. The current pandemic is reinforcing the dynamics of slowbalization and regionalization in the Indian economy.

1.7 Organization of the research

A brief description of the chapters is given below:

Chapter 1- The chapter starts with explaining the meaning of globalization and the theories of globalization that explains the deeper meaning of globalization as propagated by various school of thoughts. The periodization of globalization is discussed followed by an overview of Indian economy in context of globalization and foreign trade. Various foreign trade policies are discussed suggesting the success and challenges of globalization. The chapter also discusses the motivation of the research the broad findings of the study. Finally, an overview of the chapterisation scheme of the dissertation has been presented.

Chapter 2 – A summary of relevant literature is suggested this chapter which revolves around the study of globalization, international trade and economic growth. Also, this chapter discusses the literature related to the estimation procedures highlighting the studies that recommend the use of selected estimation techniques.

Chapter 3- This chapter presents the research gaps, the research questions and the research objectives. The chapter further discusses the variables and the data sources for each objective followed by a detailed discussion on the methodological framework of the study.

Chapter 4- The chapter explains the nexus between globalization, economic growth and international trade in context of Indian economy from 1980-2017 using Vector Error Correction Model.

Chapter 5- In this chapter gravity model of trade is used to examine the impact of globalization on the merchandise exports of India from 1991-2017 using the data from 154 trading partners of India. The model is estimated using Pseudo Poisson Maximum Likelihood estimation. The chapter concludes with the presence of regionalization in trade.

Chapter 6- The chapter deals with suggesting the evidence of slowbalization in Indian economy post the GFC in the late 2000's, suggesting it is the pace of globalization that is slowing down as suggested by the contribution of the foreign factors in the economic growth of India.

Chapter 7- This chapter presents a summary of the impact of COVID-19 on globalization, reinforcing the notion that globalization is not dying or not reversing, rather it is the velocity of the globalization that has mellowed but globalization still exists.

Chapter 8- The chapter finally presents the concluding remarks from all the objectives and major implications of the research followed the recommendations based on the findings of the study. The chapter further suggests the limitations of this research work and the scope for future research.

1.8 Conclusion

Globalization has eventually made the world a small village, blurring the geographical boundaries and removing the restrictions. Over a period of time, the Indian economy has evolved and witnessed substantial improvements and accelerated growth of trade. The study shall help to analyze the extensiveness of networks of connections, their intensity of flows and levels of activity, the velocity of the extensiveness interchanges and finally the globalization effect for the Indian economy.

CHAPTER 2 - LITERATURE REVIEW

2.1 Globalization

2.1.1 Introduction

Globalization has been a defining feature of Indian economic growth post-globalization in 1991. Globalization has been a hot topic among researchers ever since and has been linked to various facets of the economy, inflation (Ball, 2006), inequality (Feenstra and Hanson, 1996)), economic growth (Dreher, 2006), innovation (Dr Smita Singh,2019), education (Shweta Malhotra Bhatia Sigamani Panneer, 2019), exchange rate, business dynamics, unemployment (Amjad Ali, Zilakat khan, Sher Ali, 2019), poverty (Aradhna Aggarwal, 2019) and many others. Dreher (2006), referring to Clark (2000) and Norris (2000) suggest the phenomenon of globalization as "the process of creating networks of connections among actors at intra- or multi-continental distances, mediated through a variety of flows including people, information and ideas, capital, and goods. Globalization is a process that erodes national boundaries, integrates national economies, cultures, technologies and governance, and produces complex relations of mutual interdependence."

Held et al. (1999), suggest three main views about the history of globalization, namely, 'the sceptical view', 'the hyper-globalist view' and 'the transformationalist thesis'. The Sceptics believe that globalization is not a new phenomenon, and it existed for centuries; it only changes its scale, scope and extent. The intrinsic characteristic of the phenomenon of globalization does not alter with developments over a period of time. The hyper-globalists suggest the threshold time beyond which contemporary globalization evolved describing the older ages of globalization as pre-globalization periods and the modern globalization is related to attrition of

power and authority. The transformationalist thesis, while compiling the two notions, suggested globalization to be the primary reason for immense, social, political and economic changes across the world, re-shaping the economies. With this view, Dreher et al. (2008) adopt the multidimensional, pluralistic approach in defining globalization. Globalization did not emerge out of the blue. Sen (2002) suggests that globalization existed for more than thousands of years. He further distinguishes westernization from globalization.

Despite variations in dating the history of globalization, all the researchers recognize that economic factors mostly determine globalization. Considering the multidimensional nature of globalization, we describe various dimensions of the phenomenon.

According to Langhorne (2001), industrial revolution and technology transformation mark the process and journey for globalization. Bergerson (1980) highlight the political dimension of globalization, suggesting it to be a political process, as governments limit the possibilities for private entrepreneurs. Marshall McLuhan (1967) defines the world as 'global village' suggesting the socio-cultural dimension of globalization. Martens and Rotmans (1999) advise on environmental issues, becoming a global concern. They attribute the devastation of environment like ozone depletion, climate changes and other to be driven by globalization. The multifaceted dimension of globalization paves the way for a more in-depth analysis of the extent of globalization in India.

2.1.2 Globalization- Measures

Researchers have diagnosed a relationship between the opening up of the economy and economic growth. To estimate the association of trade, globalization and economic growth, a few openness measures have been gleaned.

International trade is an essential characteristic of globalization. Literature suggested a deep connection between the two phenomena. The early research embraces the idea of using dimensions of trade to measure globalization. Michaely (1977) offers the rate of change of the ratio of exports to the total product as a proxy for openness. Yanikkaya (2003) and Baldwin (2003) surveyed the literature on openness and found that the share of import in GDP is the most often used proxy to openness.

Van Hoa (2003), Sinha and Sinha (2002), Din et al. (2003) and Liu et al. (1997) use trade volumes as a proxy to measure openness. Lee et al. (2004), on the contrary, finds the use of four proxies for measuring openness, viz.-a-viz., trade-GDP ratios, imports, exports and total trade volume. The study condemns the use of the trade-GDP ratio when relating to GDP. Such an approach experiences the problem of endogeneity. When the ratio of total trade volume and GDP is calculated, it is neglected that the ratio in itself is a function of growth rate and the variables are associated with GDP growth. Sachs and Warner (1995) suggest openness index comprising of various trade-related indicators like quota coverage, tariffs, the existence of export marketing boards, black-market premium. The Index had two significant shortcomings, firstly, the criteria were getting outdated, and secondly, the indicators for most countries were available at a point of time and investigating the evolution of openness was difficult. Leamer (1988) estimated net trade flows and observed trade intensity ratios for 183 commodities for 53 countries with the H-O-S model to measure openness. Leamer's work was later enriched by Wolf (1991) using more product categories and a more extensive set of production. Lee (1993) also developed trade openness measures based on the difference between predicted and actual trade values. Incorporating the geographical dimension along with import shares, import-tariffs and black -market premia added a newer facet to the estimations of openness indicators. Anderson and Neary (1994) derived the Trade Restrictiveness Index (TRI) incorporating the data on tariffs and quantitative trade restrictions comparing the situations of free trade and trade

with the presence of tariffs and trade quotas. The Index too suffered the limitation of the coverage of several countries. Frankel and Romer (1999) further suggested an instrumental variable from geographical parameters for indicating the portion of trade driven by geographical parameters.

Harrison (1996) suggests seven openness indicators. Out of those, the actual trade flows or trade as the share of GDP are the most reliable measures. However, the measure has been criticized on the parameters of not considering the trade policies. Hence, not prudent in being the indicator of the rate of liberalization of trade. Besides, there are various other attributes like the size of the country, transportation cost, the distance between the trading partners etc. which contribute to trade. Yanikkaya (2003) recognizes that the most significant dilemma is the identification of the precise definition of "trade openness". Some studies used absolute trade volumes, whereas some focused on framing the openness indices based on trade liberalization. The research also suggests using an approach which includes the attributes of trade volumes along with restrictions on trade.

Subramanian and Tamisira (2003) define the ratio as trade intensity (total trade volume as a percentage of GDP) and use it as a measure for globalization. A better approach to measure openness was the creation of indices as various forms of trade – GDP ratios could not capture multiple perspectives related to trade. Sarkar (2008) uses imports and exports as a proportion of GDP to measure trade openness. Using time series analysis, the study finds a negative impact of trade openness on India's growth. The selection of the openness index is condemned for the reasons that the attributes of the index relate only to the volume of trade. Trade policies, restrictions to trade etc. have not been accounted for. Naghshpour and Sergi (2009) used statistically calculated z scores to develop an index of globalization using the ratio of the sum of imports and exports to GDP.

In the endeavour to quantify globalization, calibration in the form of indices is done. Levine and Revelt (1992) concede the opinion that subject to model specification, the use of different openness indices can be altered.

Using the existing measures of openness, Edwards (1998) proposed a composite measure of globalization based on the principal component analysis. He used various indices like the Warner and Sachs openness Index, Leamer openness Index, import distortions Index, Trade taxes ration, Heritage foundation index, to name a few. Wacziarg (2001) also used the Warner -Sachs openness Index along with the Non-tariff barrier coverage ratio and average import duty rate to suggest a composite indicator of trade policy openness.

Kearney (2001), however, constructed the first quantitative globalization index, capturing activities in different domains. It considered four dimensions of globalization: economic, technological, personal and political. The index is constructed for 62 countries. To create the Index, first, the relevant variables have been selected, and then a measurement for the selected variable is chosen. Each variable is then normalized, and a numerical score for each country is calculated. By taking the weighted sum of the normalized variables, the estimated numerical score is used to determine the rankings of the countries. The index does not account for geographical attributes. Hence, the country rankings depend on their policy stance towards globalization. Randolph (2005) developed the 'G-Index' presented by World Market Research Centre. The Index measures the extent of linkage between national and foreign economies. Maximum weightage of the Index attributes to economic globalization. Lockwood and Redoano (2005) proposed the Centre for Study of Globalization and Regionalisation (CSGR) globalization index', complementary to the Kearney Index. The procedure for constructing the Index, too, is the same. However, it used Principal Component Analysis (PCA) for weighing

the variables to build the indicators. This Index also is focused on 62 countries, but the period 1982 to 2004. It is based on the indicators suggested by Kearney.

Dreher (2006), proposed 'Konjunkturforschungsstelle (KOF) index of globalization' which constitutes the dimensions of Economic, social and political globalization. The principal components analysis is used to assign the weightage to the variables. Martens and Zywietz (2006) proposed the 'Maastricht Globalization Index (MGI)' which was later constructed by Martens and Raza (2008) and there upon genteel by Figge and Martens (2014). The MGI index has seven broad sets of variables, attributing to the global trade and finance, social and cultural factors, global politics, organized violence, technology and environment. The Index is constructed only for the years 2000 and 2008. This Index is the only one of its kinds which the dimension of the environment. It also incorporated the geographical attributes of the countries. Vujakovic (2010) proposed the "New Globalization Index" (NGI) which was developed by adding variables to the KOF index. Vujakovic enriched KOF globalization index by adding five new variables, adding the dimension of geographical distances between countries. The Index also uses Principal Component Analysis.

The indices differ with each other based on the different weights assigned to the dimensions, and the difference in the techniques of assigning the weight to each variable within each dimension.

Samimi et al. (2011) address the problem with these indices despite the indices being so exhaustive and extensive. They suggested the use of a large number of variables and data, limits the data collection from all the countries. In developing countries mainly, the data availability is a problem. The instrument's comprehensibility is restricted with a large number of variables, and gaining international recognition can be a problem. Also, the timelines of the information are reduced as the extensive information has to collect from diverse sources. The second

problem relates to assigning weights to the variables, especially the ones which negligible contribution. Moreover, a few of the indices do not publish the methodology adopted clearly. Another major drawback of these indices is that they do not use restriction on trade and capital except that of KOF index and NGI.

The classification of these measures of the globalization measures is done to select the best index for the study since no index is suitable for all cases. Salvatore (2010) suggests the KOF Index of Globalization (2009) as the best measure to proxy globalization as it evaluates a cardinal measure of the degree of globalization. The Index is based on three parameters viz-a-viz, the degree of economic, social and political globalization. Economic globalization is measured by trade and financial flows. Social globalization characterizes spread of notions, the flow of information, data on personal contacts, images and people with the rest of the nations. Political globalization expresses the country's participation in international organizations and the diffusion of government policies. The current study uses an augmented KOF Globalization Index to avoid the problem of simultaneity.

Chatterji et al. (2014) use four different indicators to explore the exhaustive association of openness and economic growth in India. The indicators are 'Import Penetration Ratio', 'Trade Share', 'Total taxes on International Trade' as a proportion of revenue and 'KOF globalization Index'. The import penetration ration is a measure of trade intensity which is given by imports as a percentage of GDP. Trade share is measured by taking total trade volume as a proportion of GDP. For measuring trade barriers 'Total Taxes on International Trade' as a percentage of revenue (TAX) is used. Only the Economic globalization index from the overall KOF globalization Index is taken into consideration.

Apart from the inappropriate choice of trade openness indices, methodological shortcomings too are the reason for ambiguity and inconsistency in the results.

2.2 Trade, Growth and Globalization

2.2.1 Globalization and Trade

Cristina Manteu (Economic effects of globalization: Lessons from trade models) suggested a spur in trade openness in both advanced as well as emerging economies due to globalization. Especially in the case of developing economies, with the reduction in transport cost and communication and co-ordination overheads, there has been an increase in trade of intermediary goods from these countries. Impact of globalization has always been contentious. Though International trade theories lend support to most of the questions raised. While the Ricardian model of trade emphasizes on the comparative advantage from technological diversities, the Heckscher-Ohlin-Samuelson (H-O-S) model count on the factor endowments differences. The Ricardian model explains how developed nations benefit from the globalization and hence reflect increased trade with the emerging economies based on the comparative advantage. However, the H-O-S model can explain the countries that benefit and the economies that loose with globalization as it works on the grounds of specialization. A critical notion that stems from H-O-S model is the Stolper- Samuelson theorem, which explains which country benefits or loose with the opening of trade based on the idea that comparatively copious factor gains and scant factor loses.

In contrast, New trade theory models of increasing returns suggest that trade is not necessarily an outcome of comparative advantage but also due to economies of scale and product differentiation (Krugman 1979, 1980, 1981). Meltis (2003) model suggested that liberalization of trade lead to a reallocation of resources between firms which accentuated productivity and welfare gains. Eventually, the reduced trade cost enables domestic goods to sell in the foreign market. With globalization, not only international trade increased but also the nature of trade, with participation in global value chains also accentuated. It hence can be said that globalization

does not reap the benefit on its own, the benefits are reaped through reallocation of resources, cost reductions, changes in institutional setup, government responses and many more.

2.2.2 Globalization and Economic Growth

The earlier linkages of globalization originate from conventional trade and growth theories. The differences in the consequences of globalization for growth have varied expectations for the economic models. Economic proofs can settle such contending cases.

For example, the Solow model (1958), focuses on resource allocation suggesting the role of global integration to in doing so, it emphasizes on the role of global integration to pull of efficacies. Conversely, Solow's model is not in line with the new growth theories by Romer, Lucas or Stiglitz. Romer (1994) places the onus of growth on technological innovation; knowledge flows assume primacy in his model rather than product flows. Lucas (1988) believes openness, regardless of nature, affects growth positively. Stiglitz (2002) and Bhagwati (2004), are in contention. As per the former, the benefits of globalization only percolated to advanced countries, whereas the latter believes the benefits have been accrued by least developed economies, evident from their economic growth, which has been speedy, in the years following globalization. Living standards, too, have improved; inequalities have reduced, and gender equality has bettered.

2.2.3 Trade and Economic Growth

Research has investigated the association of trade, globalization and economic growth. One section of researchers is based on the opinion that the import of goods can be detrimental to the local industries. The import of goods leads to the lesser production of similar goods and hence causing a decline in the output of the domestic industry, thereby affecting the aggregate economy. Alesina et al. (1994), Garrett (2001), Adit and Gassebner (2010), on the contrary,

contribute to the literature in assessing the benefits of globalization to economic growth. Aghion and Williamson (1998), James (2002) analyze the relationship between globalization and various factors like growth, poverty, technology, inequality, etc.

Frankel and Romer (1999), Harrison (1996), Sachs and Warner (1995), Levine and Renelt (1992), Edwards (1992), Dollar (1992), find the positive linkage between openness and growth of an economy in the long run. On the contrary, Batra (1992), Batra and Slottje (1993), Edwards (1998) have opposite conclusions.

Rodriguez and Rodrik (2001) criticize the positive linkage based on erroneous measures and proxies to openness and globalization, suggesting that the level of development of an economy affects the relationships between openness and growth. Daumal and Ozyurt (2011) reconfirm that research which relies on within-country variation usually were found to report positive growth benefits from trade liberalization. Despite the myriad existing research on the relationship between trade, growth and globalization, there is inconsistency in the reported results.

2.2.4 Globalization, Trade and Growth: Evidence from the developed nations

Most of the developed nations are said to have export-led growth. Herzer (2013), Dollar and Kraay (2004), Calderon et al. (2004), Joseph Stiglitz (2002), Frankel and Romer (1999) Kim and Lin (2009), opine the benefits of globalization have been manifested mostly in an advanced nation. However, in developing economies, higher trade openness has a negative impact on growth.

Freund and Bolaky (2008) use cross-section data from 126 countries, suggesting trade generates higher standards of living in flexible countries as compared to the rigid ones. They

suggest a positive impact of openness on per capita income. Zeren and Ari (2013) suggest a positive bi-directional causal linkage between globalization and growth for G7 countries.

Sach and Warner (1995) investigate the growth of 122 countries with respect to trade liberalization and suggest open economies exhibit higher rates of growth as compared to the protectionist nations. Vehapi et al. (2015) establish that the countries with high initial per capita income, FDI and gross fixed capital formation are benefited more from trade openness.

Abughalia and Abusalem (2013) analyze trade processes between Libya and the European Union (EU). They find that during 1980-2010 trade had a positive impact on economic growth. Mongoe and Mongale (2014) suggest exports, inflation rates and exchange rates, to be positively related to GDP. Employing cointegrated vector autoregression (VAR), they find imports to have a negative relation for South Africa using cointegrated vector autoregression. Using the ARIMA (ARDL) bounds test approach, Muhammad et al. (2012) find trade and openness to be a significant positive driver of economic growth for the Australian economy for the period 1965-2010.

Yanikkaya (2003) is unable to find any significant relationship between openness and growth on the basis of panel data analysis of 100 countries from 1970 to 1997. He highlighted the positive significance of trade barriers with economic growth. Balaguer (2002) finds the structural transformation in the export composition to have impacted the economic development of Spain.

The evidence from various studies asserts that most of the developed nations have a positive association of trade openness with the economic growth of any economy. However, the scenario with the developing nations suggests varied perspectives depending on the level of development of the economy.

The measures of openness, as suggested, are employed to understand the relationship between trade, openness and economic growth. Broadly the conclusion derived by most reflects the idea that greater openness of trade leads to faster growth of an economy.

2.2.5 Globalization, Trade and Growth: Shreds of evidence from the Developing nations

Japan, China, India and Vietnam are few amongst the developing nations of Asia to catch-up growth reaping the benefits out of globalization and increasing trade opportunities. This is reflected in their 'outwardly oriented' growth strategies as compared to the state-led 'inward-looking industrialization'.

Tsaurai (2017) reveals a weak, yet positive, bi-directional granger causality between trade and economic growth and unidirectional causality from financial development to growth in Argentina for the period 1994-2014. Keho (2017) uses the ARDL test and suggests a positive association between trade openness and growth in Cote d'Ivoire for 1965- 2014.

Zahonogo (2016) employs a dynamic growth model for 42 Sub-Sahara African countries between 1980 to 2012, reporting a significant effect of trade on growth only up to a limit. Sakyi et al. (2012) address the significant long-run relationship between trade openness and development for 85 middle-income countries from 1970 to 2009. The model suggests bi-directional causality. Vogiatzoglou and Nguyen (2016) find similar results for the Asian five countries for the period 1980 to 2014.

Kim and Lin (2009) use Pooled Mean Group estimation for 42 sub-Saharan African countries for the period 1980-2012, suggesting a non -linear relationship between trade globalization and growth. Similar results were found by Akanni (2007) for Indonesia using Vector autoregressive (VAR) analysis. Aka (2006) use openness, globalization and economic growth in a vector

autoregression model to find out that, globalization has had a negative impact on economic growth and openness has a positive impact on economic growth.

For the Nigerian economy, Gemechu (2002) uses the cointegration test and Vector Error Correction Model to examine the positive relationship between export and economic growth. Despite the increase in openness in the growing economies of East Asia, Jang (2000) is unable to find any impact on the long-run growth of these economies. The study criticizes the use of cross-section or panel data techniques, as they are unable to identify country-specific differences and the causal links.

Erfani (1999) estimates the significant positive relationship between export and economic growth for several developing economies in Asia and Latin America for the years 1965 to 1995. Michaely (1977) finds the change in economic growth positively attribute to the change in exports. Kemal et al. (2002) are unable to identify short-run causality between trade and output growth in Pakistan for the years 1960-1988. Din et al. (2003) re-establishes the results for the years 1960 to 2001 for Pakistan Economy

2.2.6 Globalization, Trade and Growth: Pieces of evidence from India

An interconnected world is not a new phenomenon for India, Bagchi (1972) asserts that since an early 20th century, India has been indulging in trade actively. Political Patronages helped British Companies to establish themselves and flourish in India. The country was not only part of the spice route, but also constituted an essential constituent of the silk route. Ever since ancient times, Indians have been involved in trade across the world. However, Imperialism opened new avenues of trade for the Indian economy. The Britishers did stem flows of product channelizing all of our efforts to their home country. Yet it also introduced India to new markets. The schemes of import substitution did impact the gains made by Indian in world trade. Post-independence there was the need to protect domestic industries from the

competition driven by the international players. Hence, before the 1980s, the policy framework was not very favourable for trade. It was in the mid-eighties that India changed its stance, strengthening foreign trade policies. The country opted for foreign trade management in terms of policies, regulations, forex reserves, current and capital account convertibility, etc. for sustained growth. The opening up of the economy in 1991 and the new economic reforms contributed to a recalibration of the Indian economy with the world. The growth is attributed to many factors including, trade, openness, the standard of living, reduction in poverty, changes in policies etc. Foreign trade is that essential integration link of a nation with the rest of the world. Thus, it plays a very crucial role in the economic health of a country. Foreign trade has long-lasting ramifications on the economic development of the country. India has been improving a lot in terms of international trade since the last four decades. Researchers have presented varying theoretical perspectives using empirical relationships. However, the results showing the relationship between trade openness and economic growth in India have come to be dubious.

In the Indian context, studies by Sahoo and Mathiyazhagan (2003) to portend bi-directional granger causality between growth and openness. Higher levels of trade openness have enhanced India's economic growth, as per their analysis. These results have also been validated by Vedpal et al. (2007). This conclusion of trade openness, especially in emerging economies, favouring for growth and output is established by Mallick (2008) using a structural VAR model. Sarbapriya Ray (2012) posits this in the long run, concluding globalization to be a cause of India's economic growth.

Kim (2011) highlights that the economic growth in developing economies is negatively linked with greater trade openness is negatively linked to economic growth in the case of developing countries. Vohra (2001), a decade from Kim, established contrary results explaining the

relationship between exports and growth for India, Philippines, Thailand, Malaysia and Pakistan for the years 1973-1993, suggesting that beyond a certain level of economic development, exports have a positive impact on economic growth. The study uses two frameworks to investigate the role of exports in growth. The first model makes use of a production function--here exports level with labour and capital as other variables are inputs in the general production function. For the second model, the economy is said to consist of two sectors, namely, exports and non-exports. The study identifies that output in the exports sector originates positive externality in the non-export sector, providing improved production methodologies, competitive environment. The empirical investigation using Engle and Granger two-step cointegration did not suggest any long-run relationship between exports and growth. However, a short-run relationship is established with an emphasis on the fact that the impact is more significant beyond a certain level of economic development. The results so established are suggesting the movement of the Indian economy from a low-income developing nation to middle-income developing nation.

Shahbaz et al. (2015) suggest that a higher degree of globalization implies higher economic growth. The study uses Bayer- Hanck Cointegration test to estimate the relationship. The author uses this technique over Engle and Granger (1987), and Engle and Yoo (1991) methodologies as these tests have low explanatory powers. Hence, the results drawn can be biased. It is further argued; these tests require the estimators of the cointegrating vectors to be normally distributed.

In using, ARDL approach, Hye and Lau (2015) apply a rolling window regression technique to stress on the positive impact of trade openness on economic growth in the short run, and negative in the long run. The focus of their study, using three proxies of trade openness, is on the construction of the composite trade openness index. The proxies being import as a proportion to GDP, exports as a proportion of GDP and total trade (exports plus imports) as a

proportion of GDP. They discover that the ARDL model can be applied to any regression model irrespective of the degree of cointegration among the variables. The empirical results indicate that in the long-run trade openness has a negative impact on economic growth. The rolling window technique established the impact not being stable throughout the sample.

Mallick (2008) uses a structural VAR model to conclude that trade openness in emerging economies favour for speed growth as it helps in enhancing output growth. He uses total trade, exports plus imports, as a percentage of GNP as the proxy for openness. In another study, Mallick (2008), discusses that liberalization of tariffs has been less beneficial to the Indian consumers as compared to the foreign exporters. This is so because, as the tariffs reduced, the foreign exporters increased their mark-ups, offsetting the reduction in the tariffs. However, with the exchange rate depreciation, the foreign exporter's mark-ups reduced as the producers absorbed a part of the increase in the cost of imports.

Kind (2002) reflects the ambiguous effects of trade liberalization on economic growth owing to the size difference of local markets. Besides, R&D incentives in low purchasing power countries are lesser as compared to high purchasing power ones. Barua et al. (2007) re-establish the similar relationship between trade liberalization and industrial sector performance. They highlight a reduction in producer's surplus and an increase in consumer's surplus because of high price margins and reduced industrial concentration.

Khan (2003) find a positive long-run relationship between exports and GDP growth using Johansen cointegration and bounds testing approach, respectively. They also suggest a bidirectional causality between economic growth and trade openness, asserting that higher levels of trade openness enhance economic growth. The results of Vedpal et al. (2007) are found to be in line with the above-established results. Dash (2009), finds a unidirectional causality from exports to growth from 1991 to 2007. However, the recommendation from the

study is similar to other work from the literature that further trade openness would lead to economic growth in long-run.

Dash and Sharma (2008) to suggest that trade had a positive impact on the economic growth for various time periods using techniques like using the Johansen cointegration test and Engle and Granger two-step cointegration analysis, respectively. Rodrigue et al. (2006) use conventional economic theory, to conclude that the globalization of production is contributing to the globalization of trade as trade eventually promotes economic efficiency. Bhandari and Heshmati (2005) suggest that India has improved a lot in terms of international trade in the last two decades. Sarkar and Bhattacharya (2005) yet, castigate the argument finding evidence of "unfavourable" impact of trade liberalization on real growth rates of India following from the ARDL approach during the period 1956-1999. The study uses the export to GDP ratio, import to GDP ratio and Exports plus Imports -to- GDP ratio to infer the abovesaid. Romer (1990), while asserting endogenous growth theories recognizes trade openness as the primary engines of growth. Still, Grossman and Helpman (1992) argue that protectionism can only facilitate long-run growth if investment in research-intensive sectors is encouraged.

The theoretical literature is insufficient in suggesting an apparent solution to the trade and growth nexus. The empirical studies provide evidence of both a positive and a negative association of globalization, trade and economic growth. There is hence, an imperative to delve into the linkage of the three in the case of Indian economy.

2.3 Slowbalization

Globalization, however, is losing steam and trends are being reversed. As multinationals establish roots and more local industries struggle, there has been constant strife with globalization. With job markets becoming fluidic, government's do not wish to ship out jobs to other nations and want to promote local manufacturing. A crisis further accentuates the

problem. It is not surprising that right-wing governments across the world have been talking about getting jobs back home. 'Make America Great Again', and India's 'Atmanirbhar Bharat' campaigns are anything but a resonance of this trend.

'The Economist' magazine addressed this formulation in its 2019 edition, suggesting a regional integration vis-à-vis a global one. Before this, Keohane and Nye (2000) elucidated the linkages between globalization and regionalization. The concepts like de-globalization, anti-globalization and protectionism, have been pitched by many but very not much beyond newspaper articles have focused much on 'Slowbalization'.

Slowbalization as a concept pre-dates The Economist issue. However, the magazine needs to be credited for bringing it into common parlance. Initially, the term was used by a Dutch trend watcher to indicate the decreasing intensity and velocity of the globalization process.

But to understand the process and its formulation, it is necessary and essential to delve into why the magazine refers to this phenomenon as slowbalization. The term slowbalization or slowing down of the pace of globalization has to assume important from the fact that globalization did indeed grow at an exponential pace before this trend kicked in. The Economist highlights that the year preceding the global economic crisis of 2008 was the golden age of globalization. So, the three decades from 1990-2010 can be characterized as a golden age. But ever since the GFC, countries have become wary of too much integration with the global economy. Hence, trade as a percentage of GDP has reduced from 61 per cent to 2008 and 58 in 2019. Multinational's profit shares have gown down from 33 per cent to 31 per cent. Foreign Direct Investments has halved from 3.5 per cent of GDP to 1.8 per cent.

This trend has further been validated by a Price Waterhouse Cooper report (2019). Economists and researchers have further strengthened this argument using indices to show the slowing pace of trade and integration. Gills (2016) propose globalization as 'neoliberal economic

globalization' is failing to shape global development. Olivie and Gracia (2020) use the Elcano Global Presence Index to highlight this trend. The focus of the economies is now on regional integration, whereas there is sluggishness in global integration. The focus of this study is placing the economic indicators in a statistically sound framework to analyze globalization trends in the geographical regions.

2.4 Gravity Model

2.4.1 Theoretical Evolution

Although most theories of economics have been derived from mathematical formulations and political and social functions, other subjects have also had a role in redefining economics. One of the common examples of this has been physics. Isaac Newton's theory of gravity has had a bearing on theories of international trade. In physics, gravity model explains that gravitational force between two objects is directly related to the mass of the objects and inversely proportional to the distance between them. The same principles apply to bilateral trade flows, which empirically represent the quantum of trade between two countries to be directly proportional to the size of the economies and inversely related to the geographical distance between them.

Tinbergen (1962) developed the gravity equation for trade to evaluate the effect of membership in BENELUX FTA and the British commonwealth on members' trade. He used national income replacing mass and the cost of transport as a substitute to distance. He further explained that trade between two economies could be explained by their economic sizes reflected by the measures of GDP or Gross National Product (GNP), their population, geographical distance between them and a set of dummies to inject institutional characteristics. In evaluating "normal pattern "of international trade in the absence of "discriminatory trade impediments" the study, estimated the effect of such agreements. It found positive elasticities of GDP and population

and negative for distance and a significant impact of commonwealth membership. Theoretical support to the gravity model, however, was discovered since the second half of the 1970s.

The model has become a workhorse for empirical studies of international trade (Eichengreen and Irwin, 1998). Linnemann (1966) and Leamer (1974) provided an economic model approach to the gravity equation to reflect the commodity composition of trade flows. Linnemann added a variable representing the "goodness of fit" of a country's exports to others' imports. Leamer estimated a modified gravity equation for various 2-digit SITC commodity classifications. While incorporating income and population variables, Leamer included different measures of relative factor endowments as independent variables. Although income and population in Leamer's equations had no economic interpretation beyond being "stage-of development" variables, income and population consistently outperformed the resistance variables (tariff, distance) and resource variables (per capita factor endowments). The work was based on the use of the difference in technology and economies of scale as indicators, Anderson (1979) was the first to suggest the conditional General Equilibrium (GE) approach to the gravity equation. Bergstrand (1985) indicates a more dynamic approach to the gravity model by further enhancing Anderson's equation. He explains the presence of prices through a general equilibrium representation. Instead of focusing on country trade flows, he investigates the bilateral intra-industry trade flows and concludes that price indices influence bilateral trade flows.

Anderson and Van Wincoop (2003) (AvW) enrich the conditional GE framework to account for the endogeneity of prices in estimation using country-specific fixed effects based on CES (Constant Elasticity of Substitution) expenditure system. They further added, reduction in a trade cost to positively impact the trade flows and downward pressure on the home country's multilateral price index. Baier and Bergstrand (2009) proposed the Taylor-series Expansion

Gravity Model for approximating the General equilibrium comparative static effects. The conditional models assume "endowment economies", and the unconditional GE model operates with explicit production functions and market structures. Differentiated product framework with increasing returns to scale is proposed by Krugman (1979) and added, reduction further redefined by Helpman and Krugman (1985). The approach gives more accurate estimated GE comparative statics when the elasticity of substitution is not known.

Eaton and Kortum (2002) deduced gravity equation from the Ricardian model focusing on the production dimension suggesting an alternative unconditional GE approach. Their estimations are in line with Anderson and Krugman that trade flows are functions of importer's economic activity and exporter's price relative to the importers' price level. Matyas (1997), Breuss and Egger (1999), Egger (2000) further contribute to improve the econometric specification. Helpman (1987), Wei (1996), Soloaga and Winters (1999), Limao and Venables (1999), on the other hand, have added new variables, thereby improving understanding of factors, and consequently enriching the econometric model with both linear and nonlinear variables. Krugman in 1991 reflected that proximity plays a crucial role in the decision to form RTAs, thereby adding a parameter to the study. A similar approach was followed by Bayoumi and Echergreen (1997) to investigate the impact of the creation of preferential trade agreements on the growth of bilateral trade. They found smaller EU integration effects and no effect of Eurozone membership on members' trade Brun et al. (2005) used real exchange rates to arrest price effects. Helpman et al. (2008) and Chaney (2008) reflected the stability of the model with firm heterogeneity.

2.4.2 Empirical framework

The gravity model for trade is specified as:

$$\text{Trade}_{ijt}=\beta_1(\text{GDP}_{it}.\ \text{GDP}_{jt}).\ \beta_2(\text{Distance}_{ij}).\ u_{ijt} \qquad (2.1)$$

To conduct linear regression, the earlier-mentioned equation is transformed into a natural logarithm form.

2.4.3 Problems with the gravity model

Despite the gravity model being termed as the workhorse of empirical application to trade estimations, the model is subject to several biases and inconsistencies. However, these can be avoided with, and literature has time-to-time recommended the solutions to deal with the same. This section highlights the challenges with the structural gravity model and their possible solutions. Based on the recommendations, a reliable estimate of the model is formulated.

2.4.3.1 Multilateral resistance term

Baldwin and Taglioni (2006) diagnosed three basic mistakes in the evaluation of the gravity, namely, the Gold medal, silver medal and Bronze medal mistakes.

The Gold medal mistake is reflected in the use of Log form of GDP and various other variables as proxies for Multilateral Resistance Term (MRT). It omits Anderson and van Win coop's and Baier and Bergstrand's (2007) definition for remoteness. These variables directly influence the trade costs, and hence the estimations tend to be biased. Silver medal mistake specifies averaging the bilateral trade flows. The theory argues that each way of trade shall be treated separately.

Bronze medal mistake attribute to improper deflation of trade flows, which may induce bias because of spurious correlation. This mistake can be taken care of by pertinent use of time dummies or country effect. If gold medal mistakes are dealt with, bronze medal mistakes cannot ensue.

Solution: The use of multilateral resistance terms is widely used in literature. Anderson and van Wincoop (2003) explored the iteration based nonlinear least-square programme to

introduce MRTs in the static equation. They initially estimated the trade cost without accounting for MRTs and then used these trade costs to form a set of MRTs. Further, the gravity model is re-estimated using the initial MRTs, and a new set of trade costs are obtained. The process is repeated till the convergence is achieved, and the gravity model does not change anymore. The reduced-form dimension of this treatment suggests the MRTs that are approximated by 'remoteness indexes', estimated as a function of distance and GDP. Baier and Bergstrand (2009) second the idea whereas Head and Mayer (2014) pan the approach on theoretical grounds.

Hummels (2001) and Feenstra (2016) suggest the solution to resolve the computational difficulties of the AvW model and suggested the use of importer and exporter Fixed Effects (FEs), broadly known as directional fixed effects. Olivero and Yotov (2012) further introduced the exporter- time and importer- time FEs in dynamic gravity estimations to account for MRTs. They further suggest that the use of cross-section- time FEs will absorb the size variable along with various other observable and unobservable cross-section specific attributes.

2.4.3.2 Zero Observation

The zero observations issue ensues when a country does not have trade relations with others. It is severe in the case of disaggregated trade flows as compared to the aggregated observations. Zero observations stem from many reasons. First, it can be a reporting error because of missed observation or erroneous measurement. Second, some goods may be incongruous for international transport, because of either low shelf life or voluminous, yet low-value goods. Such observations shall not be dropped because of their economic contribution. Third, it can be because of a specific product category not available in a country for trade. Such information can be dropped. Furthermore, it can also be because of the exporter's decision to export or not

to export to a specific market. However, it is challenging to diagnose the actual reason of zero observations in each set of data.

The fundamental way of reckoning gravity model is the use of a log-linear version. Since the log of zero is not defined, such a term must be either altered or dropped. Bacchetta et al. (2008) suggested dropping all zero observations, which may lead to inconsistent results. This approach can only be pursued if zero observations cause randomly distributed errors. Also, a minuscule constant, say, a single unit value is added to the observations, and then the logarithmic transformation is done. However, this approach, too, can lead to inconsistent estimates. Ordinary Least Square estimation is ill-suited for the gravity model. This is so because when trade values are transformed in logarithmic form, they are dropped from the estimation sample.

Solution: Several approaches are suggested to deal with the presence of zero trade flows. The most convenient and straightforward approach is to replace the zero trade flows with an arbitrary minuscule value. Head and Mayer (2014) did not appreciate the approach and regarded it to theoretically inconsistent as the results majorly rely on the units of measurement and hence the elucidation of the coefficients is bereaved. Martin and Pham (2008) propose the notion of Eaton and Tamura (1995) to use Tobit estimator, though, much is not explained for the Tobit threshold. Further, the Tobit model is employed in a situation when either actual trade is minimal, and they are rounded off to be zero or a negative trade. In either case, the model is not well suited to the situation of zero trade values. Helpman et al. (2008) (HMR) further refined the approach suggested HRM model with stages, where the first stage is Probit estimation to estimate the probability to export and the second stage OLS estimation. The Tobit estimator is proved to yield unbiased estimates when some observations are zero or are close to zero. Tobit measure depends on the normality and homoskedasticity. Linders and de Groot (2006) argued that trade data tend to suffer from the problem of heteroskedasticity, which raises

the question of the estimate from Tobit's maximum likelihood estimator. Egger et al. (2011) suggest two-part gravity model which can decompose the effects of the variables on exports into effect on extensive and intensive margins, where extensive margin reflects the decision to export to a trading partner and intensive margin reflects the values of exports conditional on buoyant exports. In calculating the extensive and intensive margins, the approach takes onto consideration endogenous variables like RTAs. Santos Silva and Tenreyro (2006) suggested the use of a Pseudo-Passion Maximum Likelihood (PPML) estimator arguing its advantages over the Tobit model. He advises on estimating the gravity model in multiplicative form instead of logarithmic form. Monte Carlo simulations show that the PPML estimator performs very well even when the proportion of zeroes is large. Since then, PPML estimators have been applied widely in estimating the gravity equations.

2.4.3.3 Heteroscedasticity

Trade theory presumes that firms are homogenous. Such models infer the zero trade flows as measurement error. Helpman et al. (2008) expounded zero trade flows in a model with heterogeneous firms explaining the asymmetric trade patterns. In this model, the variable proportion of the trade costs reduces the exports, and the fixed entry cost diminishes the likelihood of a firm's decision to export. Trade data usually suffers from the problem of heteroscedasticity. When heteroscedasticity is present, OLS estimators generate biased and inconsistent estimates of the effects of trade costs and trade policy.

Solution: AvW (2003) suggest that the issue can be dealt by transforming the regressand into size-adjusted trade, that is, the ratio of the trade and the product of the market size of the trading partners, $\frac{X_{ij,t}}{E_{j,t}Y_{i,t}}$ .The variance of the error term $\varepsilon_{ij,t}$ is proportionate to the product of the sizes. However, the approach is criticized on two grounds, first, using size-adjusted trade as the regressand does not solve the 'zero trade flows' issue and secondly, country size is the only

parameter to deal heteroscedasticity. PPML approach is suggested as a possible solution to this issue.

2.4.3.4 Endogeneity

Trefler (1993) suggest the problem of endogeneity to be very popular in trade models. It may occur with the variables chosen. One of the significant challenges is to estimate the reliable effect of trade policy variables as they tend to endogenous. For example, economic size and per capita income are employed as exogenous variables, which are contradicted on both empirical and theoretical grounds as trade has a definite impact on GDP and per capita income. RTAs, for example, are implausible to be exogenous. The natural trading hypothesis suggests that countries are inclined to form RTAs with partners with whom they previously have traded. In such a case, a dummy for RTA is correlated with the error-term leading to an upward-sloping bias as the unobserved attribute explains the reason for some countries trading more and hence a high probability of formation of an RTA. Hence, trade policy variables may suffer with "Reverse Causality". The use of observed dummies and country time model dummies can also be perfectly collinear, and hence it is challenging to capture the impact of the policy variable. Beyond Reverse Causality, endogeneity may also arise because of omitted variable bias. For instance, the attributes of RTAs other than the economies factors which are omitted in the regression. And hence it is challenging to deal with the issue of endogeneity of RTAs.

Solution: Hausman and Taylor (1981) proposed the use of Instrumental- Variable (IV) technique to fix the problem of endogeneity. However, the approach has not been successful for dealing endogeneity problem due to lack of reliable instruments. Baier and Bergstrand (2007) though suggest using IVs to be the best way to isolate the impact of RTAs on the trade flows. They further suggested using the Average Treatment Effect (ATE) as suggested by Wooldridge (2010). Using country pair FEs may also be used as it eliminates the unobservable

linkage between the error term and the endogenous trade policy covariate. The FEs absorb the bilateral time-invariant covariates and retain the impact of bilateral trade policy as it is time-varying. Egger and Nigai (2015) find a pair fixed effect to be a worthy approach to measure bilateral trade costs.

The use of IV technique does not significantly distort the coefficient of another variable, established earlier. Generalized Method of Moments (GMM) estimation with lagged level can be used. Mansfiel et al. (2008) used Probit models to study the probabilities of formation of RTAs between a pair of countries. Literature suggested such approaches cater more to solving the selection bias than addressing the endogeneity issue. Omitted variable bias may, on the other hand, lead to endogeneity. To fix this problem, GMM estimation with the lagged level can be used.

2.4.3.5 Selection bias and the control group problem

Sadeh (2014) pointed out that the selection of countries and time in the sample prejudices the impact on trade. Baier and Bergstrand (2007) suggested that the formed control group of countries should be comparable to another sample to control the real effect of the variables. Also, endogeneity leading to omitted variable bias may arise, leading to a biased dataset (Tenreyro 2001). This case can be solved using the selection model of Heckman. Egger (2002) pointed out, Hamilton and Winters (1992) indicated enormous trade potential as a result of the econometrically misspecified model. This could be because of the auto-regressive nature of errors or prospects of correlation of individual effects with the explanatory variables.

2.4.3.6 Adjustment to trade policy changes

Trade flows do not reciprocate to the policy changes immediately. Trefler (2004) criticizes the estimation that is pooled over sequential years. Cheng and Wall (2005) further argue that the regressors and the regressand do not change in a year.

Solution: Trefler (2004) suggested the use of panel data with intervals as compared to data pooled over continuous years. He used the 3-year interval, Anderson and Yotov (2016) used 4-year interval estimation. Olivero and Yotov (2012) concluded in their study that the estimates derived using three year and 5-year interval data are similar and are better than those generated by the data pooled over consecutive years.

2.4.4 Estimation technique of Gravity model

The extensive use of the gravity model in empirical studies has motivated the researchers to strengthen the precision of its estimates. Studies also argue the ambiguity caused by exploiting cross-sectional methods, as they do not account for heterogeneity in the trading relationships. To solve for heterogeneity, Fixed effects (FE) models are used. FE recognizes the misspecified factors synchronously describing the trade dynamics between the pair of countries. The earliest practice of estimation of the gravity model relies on the use of log linearized Ordinary Least square (OLS). The log-linear gravity model suffers from the issues mentioned above.

Santos Silva and Tenreyro (SST) (2006) explain that OLS will generate inconsistent estimates even if the regressand is positive. This is so because the while log linearizing the gravity equation, logarithmic transformation alters the properties of the error term. When OLS has employed the expected value of log linearized error term will depend on the covariates of the regression. That is to say that logarithmic transformation will generate the estimates of $E\ (ln\varepsilon_{ij})$ instead of $ln\,E(\varepsilon_{ij})$. Jensen's inequality is depicted here as $E\left(ln\varepsilon_{ij}\right) \neq ln\,E(\varepsilon_{ij})$, where $E\left(ln\varepsilon_{ij}\,|x_{ijt}\right) \neq 0;\ ln\,E(\varepsilon_{ij}\,|x_{ijt}) = 0$. Given Jensen's inequality and concavity of the logarithm function, OLS will generate inconsistent and inefficient estimates of covariates. Further, in the case of zero trade values, it becomes a problem with log linearized gravity equation as the logarithm of zero is not defined. Applying OLS in such a situation may lead to downward bias and underestimation of the gravity equation coefficients.

Literature has suggested various estimation techniques like Tobit and Probit model, Non-Linear Least Square (NLS), Helpman, Melitz and Rubinstein (HMR) (2008), Poisson models etcetera to fix the mentioned issues.

Cheng and Wall (2005) pointed out that standard pooled-cross-section methods suffer from estimation bias arising because of misspecified variables in the model. They criticized model employed by Wall (1999) and Cheng (1999), for using country-pair and period dummies to indicate the trade association, in the light of alternative models proposed by Glick and Rose (2001), Matias (1997) and Bayoumi and Eichengreen (1997). Glick and Rose (2001) used fixed effects to understand the impact of currency unions, Bayoumi and Eichengreen (1997), Matyas (1997) used the gravity model to suggest the likelihood of countries to be in same regional agreement, Egger (2002) to gauge the trade potential and Nag and Nandi (2006) to estimate India's trade potential in SAARC nation.

Hausman test is used to decide between fixed effect and random effect model. Wooldridge (2000) pointed out that random impact is possible when intercepts are not correlated with independent variables and hence, Egger (2000) questioned the suitability of the RE model. Westerlund and Wilhelmson (2011) suggested both OLS, as well as RE and FE estimators, are inconsistent in estimating the log-linear gravity model.

Endogeneity makes the traditional REM estimates inconsistent. Hence, Egger and Pfafferymayr (2004) postulated an HTM- SUR model (Hausman-Taylor seemingly unrelated regression) which accounts for the presence of a time-invariant variable in the model and also diminishes the bias due to unobserved endogenous effects. Use of Hausman – Taylor estimator is promoted by Egger (2002,2005) as a solution to the problem of endogeneity of the variables.

Heckman (1979) suggest a two-step approach to reduce the sample selection bias. The first step is a Probit regression to estimate the probability of exporting at the firm level based on the

decision of the firms, and then it is used to estimate the volume of the trade. The approach has been used widely in the literature to deal with zero observations in the trade data. However, HMR, note that the sample selection bias is not the only issue, and the estimates are also impacted by the omitted variable bias. They further extended the Heckman model to account for both the sample selection bias and the heterogeneity bias, proposing a two-step estimation procedure. The first step is similar to the Heckman approach with an addition that the probability exporting is further used to estimate the effect on the extensive margin of trade, that is, the decision to export from one country to another. The second step in the HMR approach is a gravity equation to estimate the effect on the intensive margin; that is, the number of exporting firms from one country to another. However, both the approaches are used in logarithmic form for estimation, which may lead to biased coefficient as suggested by Silva and Tenreyro (2006). Further, both the said approaches fail to control for heteroscedasticity.

Based on the problems of zero trade flows, the linearity of the gravity equation, nature of the error term and presence of heteroskedasticity, Henderson and Millimet (2008) advocated the use of non –parametric estimations. Silva and Tenreyro (2006) proposed the use of multiplicative model and supported the implementation of PPML estimator. He claims PPML estimator to provide consistent estimates of the original nonlinear model.

Firstly, PPML is consistent in the presence of FEs and takes into account the observed heterogeneity. Secondly, Poisson estimators can include zero observations in the model naturally because of its multiplicative form. Third, coefficients of regressors from the PPML are interpreted as simple elasticities, if they enter in logarithms and as semi elasticities if they enter the equation in levels, as under OLS. The dependent variable is specified in levels. Also, it avoids under-prediction of the large trade volumes as it generates the estimates of trade flows as compared to the log of trade flows.

PPML estimators too have been criticized on several grounds. Burger et al. (2009) highlight the issues that trade data tends to exhibit over-dispersion (variance greater than mean). PPML works on the assumption of equi-dispersion (conditional variance is conditional mean) which yields consistent but inefficient estimates. They explain that the PPML model considers only observed heterogeneity and not unobserved heterogeneity. Some researchers have used count data models like negative binomial data as trade data tends to exhibit over-dispersion (variance greater than mean). Silva and Tenereyo (2011) argue that Poisson is consistent as a PPML estimator, irrespective of the distribution of data. It is not required for the data set to have Poisson distribution. They suggest to achieve the efficiency from allowing overdispersion; it is crucial to know to exact nature of overdispersion, which is generally unknown.

Further, they highlighted the use of negative binomial estimator is scale-invariant; that is, results would vary if the measurement unit of the dependent variable is changed. Trade-in dollars and trade of millions of dollars would yield different results. They also show that Poisson performs strongly even with the presence of a large number of zeros in the dataset.

Burger et al. (2009) suggested Negative Binomial Pseudo Maximum Likelihood (NBPML) and various Zero-inflated models corrects for overdispersion and unobserved heterogeneity. Silva and Tenreyro (2011), however, find PPML to be consistent and well behaved in the presence of overdispersion of the dependent variable. Soren and Bruemmer (2012) validate the notion. Head and Mayer (2014) also suggested PPML and Gamma Pseudo Maximum Likelihood (GPML) be consistent with over-dispersion and highlighted that use of NBPML cannot be justified because variance exceeds the mean as the estimates depend priorly on the measurement unit of the dependent variable. Using Monte Carlo simulation, Martinez- Zarzoso (2013) compares the performance of PPML, GPML, Feasible Generalized Least Squares (FGLS) and NLS and find the performance of PPML to be similar to that of FGLS. However,

he noticed the estimators change with change in dataset and change in sample size. He hence concludes that the choice of the estimator to be dependent on the nature of the dataset.

Martin and Pham (2008) highlight that even if PPML estimator is less biased, it is not robust to the problem of zero trade and heteroscedasticity. Silva and Tenreyro (2011) argue that the simulations were done by Martin and Pham (2008) and Martinez and Zarzoso et al. (2007) reveal no information on the performance of the PPML model of constant elasticity model as the data used in their simulation exercises are not generated by a constant elasticity model. To validate this, they re-investigated the performance of PPML estimator with constant elasticity model and a large proportion of zeros in the dependent variable. They find the PPML estimator to be consistent and well-behaved and somewhat more robust to deal heteroscedasticity. Also, GPML is found to be consistent and well behaved but has larger bias than PPML, whereas, Martinez-Zarzoso (2013) compares PPML estimator with GPML and NLS estimators and suggest that if variance function is misspecified, GPML estimator loose precision. Head and Mayer (2013) propose that PPML should not be used alone as the single "workhorse" estimator but along with other estimation methods. NLS technique tends to reduce the efficiency of the estimator as it assigns more weightage to the noisier observations. In contrast, PPML gives the same weights to all the observations and works on the assumption that the conditional variance is proportional to the conditional means.

Burger et al. (2009) use a Zero- Inflated estimation technique to provide an alternative to lognormal and PPML estimator. Sukanuntathum (2012) uses OLS, NLS, GPML, PPML, and NBPML estimators and recommends NBPML for estimating consistent parameters. Arvis and Shephard (2011) and Assane and Chiang (2014) favour the use of PPML estimator as the workhorse for gravity model estimation. Rashidia and Lahirib (2013) advocated PPML estimator to solve the selection bias and failure in forecasting the trade flows. Kareem (2013)

used a gravity equation for African countries for the period 1980 to 2002 and employed numerous models including pooled regression, fixed-effects model, random-effects model, GLM, PPML, NBPML. He concluded that most of the linear estimators outperform the GLM estimators in the robustness checks. Felipa de Mello-Sampayo (2016) explained PPML generates smaller estimates of trade costs in comparison to OLS. Mubashir Hussain (2017) employed the latest developments made in the empirical literature of gravity model as proposed by (Piermartini and Yotov, 2016) estimating the multiplicative form of gravity model as the PPML estimator, concluding that PPML-Estimator approach is consistent with gravity model and provides robust empirical results.

After a cautious audit of the literature and considering various alternatives, it can hence be suggested that Poisson estimates outperform other techniques over numerous constraints of structural gravity models, particularly the presence of zeros in trade data and heterogeneity. However, the model should be checked for its robustness using other models. The study employs PPML estimator.

2.4.5 Variables used in the gravity model and Application of gravity model

Export-Led-Growth Hypothesis (ELGH) is one of the significant determinants of growth of Asia's developing economies. The exports are directed to developed countries like the US, Europe, Japan and the UAE (Adam and Chua 2009). Babatunde and Busari (2009) confirm the same for Africa. Balaguer (2002) acknowledges structural transformation in export composition as a critical factor for Spain's economic development and hence concludes that higher level of export orientation helps a country grow faster. Erfani (1999) provides evidence for export-led hypothesis in Asia and Latin America.

Agrawal (2014), Dhawan and Biswal (1999), Dash and Kumar (2007), Marjit and Raychaudhari (1997), Kaushik and Kelin (2008) empirically tested ELGH for India and

confirmed that increased exports had a bidirectional causal relationship with GDP. Sinha (1996) investigate the relationship between the openness of trade and economic growth and reported bi-directional causality between the two, suggesting that both export and import have a positive impact on economic growth. Guntukula (2018) study from 2005-2017 reported similar results, both for exports and imports.

ELGH has been tested to be applicable to Indian economic growth. Thus, it's imperative to study the determinant of the exports, especially the impact of globalization on the exports. Rose (1991), in her study of 14 countries, suggest that in the case of small economies, changing the industrial structure and tariffs have a significant contribution to trade growth. Oguledo and MacPhee (1994) found 49 explanatory variables from the literature survey, out of which, most favoured nation tariff rates, wholesale price indices and institutional conditions are most significant.

Bougheas et al. (1999) use an augmented gravity model using infrastructure variables of stock of public capital and the length of the motorway network. They argue that transport costs are a function of public infrastructure along with transport cost. Zarzoso and Lehmann (2004) analyze that income differences, exchange rates and infrastructure are important determinants of bilateral trade flows in assessing the trade potential in Mercosur-European Union trade after the duo trade blocs agreed. Abraham and Hove (2005), using Krugman's approach, investigate China's trade performance using its RTAs, and found it to have increased the export potential, particularly with ASEAN and a few South and East Asian countries, for the years 1992-2000.

But not all studies have pointed to a positive correlation between trade and distance. The issue has divided economists over the issue of distance as a factor for trade. Thai Tri Do (2006) study the Vietnamese economy with 23 European countries from 1993-2004 and found that distance and history do not have any impact on trade potential whereas GDP, population and

real exchange rate volatility have. He also suggested that not all the trade potential is exploited until this time with countries like Austria, Finland and Luxembourg. Bac Xuan Nguyen (2010) contradicts results of Thai Tri Do (2006) for the Vietnamese economy but trade with ASEAN countries, using the gravity model and concluded that Vietnam has more exports to neighbouring countries. Binh et al. extend the study on Vietnam to add that cultural similarity has a positive impact on the trade growth along with the exchange rate. This is also one of the first studies that go beyond RTAs and measurable indicators to qualitative characteristics in defining the impact on trade. Rahman (2009) analyze the trade potential using gravity model for Australia using a cross-section data of 50 countries, suggesting that the trade has been positively affected by economic size, GDP per Capita, openness and a common language and is negatively affected by distance.

Bai et al. (2012) apply a gravity equation to assess the impact of the GFC on exports from China to its top-ten export destinations. Miran et al. (2013) studied the export of raisins from Turkey and six other countries, suggesting that raisin trade will be benefited if sea routes are used for transportation of the goods. Kumar and Ahmed (2015), study Asian countries to conclude that SAFTA made a positive impact on enhancing intra-regional trade among SAARC countries. Khan and Khan (2013) Investigated the success of the gravity model in the case of Pakistan, highlighting the untapped trade potential with Japan, turkey, Malaysia, India and Iran. Wang (2016), use PPML estimator for the estimation of the gravity model for a dataset of 80 countries over fourteen years (2000-2013) to gauge the trade dynamics of vegetable oil. The results suggest that the GDPs of importer countries have a statistically positive impact and distance has a negative effect on the trade of vegetable oil.

Savrul and Ahmet (2015) investigate the role balance of trade in member countries of the Black Sea Economic Cooperation Organisation (BSEC), suggesting a positive and significant impact

of globalization on international trade. Kim and Hangshin (2002) in their study, use a social network approach to indicate that the world has mostly globalized during 1959-1996, which further led to an increase in trade. Mukherjee (2008) presents that international trade is facilitated by globalization as it leads to a reduction in global trade barriers, promoting economic integration globally.

Mubashi (2017) by employing PPML-estimator investigates the influence of globalization on Pakistan's export for 21 years (1993-2013). He uses IFI as a proxy to measure globalization, which he posits has a significant positive impact on Pakistan's exports. He further suggests GDP, per capita Income and distance as the determining factors of Pakistan's export.

Manteu (2008) suggests that India and China have been exhibiting an accelerated globalization process leading to a substantial increase in international trade flows. Dobifafs and Paulus (2016) observe the level of globalization through the distance coefficient. Shahbaz et al. (2015) in their study suggest that the Indian economy reports higher economic growth and international trade with a higher degree of globalization.

2.4.6 India

Ghosh (2002) uses the gravity model to investigate trade flows from India to SAARC, the European Union (EU), ASEAN and North American Free Trade Agreement (NAFTA), highlighting the presence of regional and country bias. Batra (2006) uses an augmented gravity equation to estimate India's trade potential by exploiting data from 146 countries for 2000. She, using an OLS estimation, validated that the economic size is positively related to the trade flows, whereas geographical distance is negatively correlated. Hassan (2001) investigated the trade amongst SAARC member countries, implying that there is much for the members to yield from the integration. Vohra (2001) expounded that exports have a positive impact on growth once a country has achieved a certain level of economic development, highlighting the

relevance of export expansion strategies. Bhattacharyya and Banerjee (2006) investigated 177 countries with which India had trade relations at least once during 1950 and 2000. The study highlighted that India traded more with developed countries as compared to the underdeveloped countries, and the size of the trading partner had more impact on trade flows as compared to the degree of development suggesting gravity model could explain approximately 43% of the variation in the direction of trade.

Nag and Nandi (2006) using gravity equation, investigated advancements in the trade from India in SAARC. 'Natural trading partners' hypothesis was used as the substructure to arrest competencies of SAARC. Mehta and Bhattacharya (2000) estimated a similar model using per capita GNP, real exchange rate, and tariff rates to accentuate that eradication of tariff would amplify intra-regional trade by 160%. The model is said to suffer from problems as elucidated by Egger (2002). Prabir De (2010) used the gravity equation to ascertain the effect of the GFC on India's trade dynamics. It was, however, discovered that India had reconnoitred the maximal trade competencies with countries in Asia-Pacific, which can further be increased with the help of trade facilitation and liberalization of tariffs.

Chakravarty and Chakrabarty (2013) assessed India's mutual relationship with bordering nations concluding distance as a crucial factor instigating the direction of trade. Tripathi and Leitao (2013) investigated trade flows for India during 1998 and 2012, suggesting political globalization and cultural contiguity to have a positive impact on trade. Panda et al. (2016) estimated RE panel regression model for India and China and highlighted that distance, GDP, and common language impact India's trade flows.

Chandran (2018) studied the bilateral FDI inflows into ASEAN-5 countries using a gravity model. He used pooled OLS, fixed effect with vector decomposition, and random effects. The findings suggested that ASEAN integration had a positive impact on the FDI inflow into the

region. Alam and Ahmad (2018) used a gravity model to ascertain the determinants of export flows from India to the Gulf Cooperation Council (GCC) countries during 2001 and 2015. The study found that exports were determined positively by size, the openness of trade, common colonial relationship and diaspora, and negatively by tariffs and distance; hence, suggesting the possible ways to increase the exports is tariff reduction.

Table 2.1 Summary of various estimation techniques of gravity model

Estimation method	Advantages	Disadvantages	References
Truncated OLS	- Simple	- Loss of information (elimination of zero flows) - Biased coefficients	Linders and de Groot (2006); Westerlund and Wilhelmsson (2009); Martin and Pham (2008)
OLS ($1+T_{ij}$)	- Simple - It deals with the zero trade flows problem	- Biased coefficients	Linneman (1966), Bergeijk and Oldersma (1990); Wang and Winters (1991); Baldwin and diNino (2006)
Tobit (censored regression)	- Simple - It deals with the zero trade flows problem	- Same set of variables to determine the probability that an observation will be censored - Lack of theoretical foundation	Soloaga and Winters (2001); Anderson and Marcouiller (2002); Baldwin and diNino (2006); Schiavo (2007); Martin and Pham (2008) and Pham (2008)
Panel fixed effects	- Simple -It controls for unobserved heterogeneity	- Loss of information (constant terms in the regression is dropped) -Elimination of zero flows -Sample selection bias	Matyas (1998); Egger (2000); Glick and Pfaffermayr (2003); Micco et al. (2003); Micco et al. (2003); Andrews (2006); Henderson and Millimet-2008
Heckman two-step	-No multicollinearity problem It provides a rationale for zero trade flows	- It may be difficult to find an identification restriction	Bikker and de Vos (1992); Linders and De Groot (2006); Martin and Pham (2008)
PPML (Poisson Pseudo Maximum Likelihood)	- It provides unbiased estimates in the presence of heteroskedasticity -All observations are weighted equally -It deals with the zero trade flows problem -The mean is always positive	- It may present limited-dependent variable bias when a significant part of the observations is censored.	Westerlund and Wilhelmsson (2009); Liu (2009); Siliverstovs and Schumacher (2009); Shepherd and Wilson (2009); Martínez-Zarzoso et al. (2007); Santos Silva andTenreyro (2006); Anand Puttitanun (2009)
NLS (Nonlinear Least Squares)	- It deals with the zero trade flows problem	- It assigns more weight to observations with a larger variance(inefficiency). -Not robust to heteroskedasticity.	Santos Silva andTenreyro (2006)
FGLS (Feasible Generalised Least Squares)	- It deals with the zero trade flows problem -It is robust to heteroskedasticity	-the variance covariance matrix should be estimated first	Martínez-Zarzoso et al. (2007)
Gamma Pseudo Maximum Likelihood	It deals with the zero trade flows problem It is robust to heteroskedasticity	Less weight to observations with a large conditional mean (less prone to measurement errors)	Martínez-Zarzoso et al. (2007)
Helpman, Melitz and Rubinstein-2008	It provides a rationale for zero trade flows Unbiased estimates	-Difficult to estimate -Additional data is required	Helpman et al. (2008); Santos Silva andTenreyro (2008)

2.5 Factor Model

2.5.1 Introduction and Evolution

The choice of an appropriate model for emerging economies is a complicated task as emerging economies are exposed to precipitous structural changes and alterations in the policy regimes. To capture the role of various factors contributing to the growth in the Indian economy, the study resorts to the use of Dynamic Hierarchical Factor Model (DHFM). DHFM is a representation of the Dynamic Factor Model (DFM) in multiple levels.

Factor models are a dimension reduction technique. These models primarily rely on the Principal Component Analysis (PCA), which is used to condense the dimensionality of the data set (Jolliffe, 2002). Pearson (1901) introduced PCA and Hotelling (1993) further expounded it. PCAs are based on the notion of orthonormal decomposition. Later, Sarget and Sims (1977) recommend the use of factors to encapsulate the information using various predictors. Cubadda et al. (2012) suggest that dimension diminution in the form of a common factor is powerful in explaining comovement. Lindley and Smith (1972) present hierarchical models, and Gameran and Migon (1993) extended them to the hierarchical model. Kose et al. (2003, 2008) apply DFMs to gauge the synchronization of business cycles in the era of globalization. Stock and Watson (2009) study the domestic and the regional factors affecting the housing construction using DFMs. Moench et al. (2013) enriched the model developed by Kose by reducing the number of parameters to be estimated. The study uses the model and the MATLAB estimation code, as suggested by Moench et al. They have used a dynamic hierarchical factor model to gauge the within and between- block variations; the idiosyncratic component and the common factor. The model is estimated via Markov Chain Monte Carlo (MCMC) method. Based on the model researchers have been done to find the degree of comovement among various factors. Forster et al. (2014) examine the degree of comovement of gross capital inflows.

In a vector x of variables p, and covariance matrix Σ, the linear expression $\alpha_1^{\mathrm{T}} x$ having the maximum variance is known as the first Principal Component of x, where $\alpha_1 = \alpha_{11}, \alpha_{12}, \alpha_{13}, \ldots \alpha_{1p}$. The second principal component is given by $\alpha_2^{\mathrm{T}} x$ will have the maximum variance subject to the constraint that $\alpha_1^{\mathrm{T}} x$ is uncorrelated to $\alpha_2^{\mathrm{T}} x$. The further PCs can be calculated up to the p. The p observed random variables represented by $x_1, x_2, x_3, \ldots., x_p$, can be written as the linear function m with common factor $f_1, f_2, f_3, \ldots., f_m$ on the following manner:

$$x_1 = \lambda_{11} f_1 + \lambda_{12} f_2 + \lambda_{13} f_3 + \ldots\ldots \lambda_{1m} f_m + e_1 \quad (2.2)$$

$$x_2 = \lambda_{21} f_1 + \lambda_{22} f_2 + \lambda_{23} f_3 + \ldots\ldots \lambda_{2m} f_m + e_2 \quad (2.3)$$

$$x_p = \lambda_{p1} f_1 + \lambda_{p2} f_2 + \lambda_{p3} f_3 + \ldots\ldots \lambda_{pm} f_m + e_p \quad (2.4)$$

The equation 2.4suggests the generic linear regression and the general vector form of factor models can be written as:

$$x = \Lambda f + e \quad (2.5)$$

Where, Λ are the loadings or weighting matrices, describing the contribution of a variable to the common factor f_t. In case of factor models Λ and f are unknown. The variables x_p are assumed to be the sum of two unobservable orthogonal components: the common factors, f_t , that is, the component resulting from the factors which are common to all the variables and an idiosyncratic component e, that covers the shock specific to all the variables f_t. The model works on the following assumptions:

The idiosyncratic processes $E[e]\ and\ E[e_t']$ are mutually orthogonal, with $E[e] = 0$. Hence, the variance-covariance matrix of e is a diagonal matrix, that is, $\sum e = E[ee'] = \Psi$

The factors, f_t, are centred, that is, $E[f] = 0$ and are mutually orthogonal for all t. Hence, the variance-covariance matrix of f, $\sum f = E[ff'] = I_m$, is a diagonal matrix.

The factors f_t and the idiosyncratic component e are not correlated, that is, $E[fe'] = 0$

The variables are independent and identically distributed over time.

When the assumption (iv) operates the model is represented as the Static Factor Model, where the factors, f_t, do not possess their dynamic and relationship between the factors and the variables in linear with constant weights. However, if this assumption is relaxed, we assume time dynamic within the variables and hence develop the Dynamic Factor Model.

Assuming that f_t and e are not correlated and are zero mean the variance-covariance matrix is given by

$$\sum \mathrm{x} = \Lambda \sum f \, \Lambda' + \Psi \tag{2.6}$$

Given (Λ, Ψ) be the solution, and T is the quasi-orthogonal matrix, then $(\Lambda \mathrm{T}, \Psi)$ can also be the solution as $(\Lambda \mathrm{T})(\Lambda \mathrm{T})' = \Lambda \mathrm{T}\mathrm{T}'\Lambda' = \Lambda\Lambda'$. Hence normalizing the variance-covariance matrix of f_t , $\sum f = I_m$ and assuming that diagonal elements of the variance-covariance matrix of $e, \sum e$, are bounded, we get:

$$\sum \mathrm{x} = \Lambda\Lambda' + \Psi \tag{2.7}$$

The model is then estimated in two steps: Initially, with restrictions on Λ , Λ and Ψ are calculated, and then f is estimated. Further solutions can be estimated by multiplying the orthogonal matrix with Λ using this chain procedure. The loadings matrix Λ can be calculated by minimizing the sum of the squared residuals given by:

$$\sum_{t=1}^{T} (x_t - \Lambda f_t)' \, (x_t - \Lambda f_t) \tag{2.8}$$

2.5.2 Dynamic Factor Models for time series and panel data

Factor models are widely deployed for evaluating time series factors. Originally Geweke (1977) proposed the Application of factor models to time series, which was earlier developed for the cross-sectional data. DFM proficiently models the data where a number of series observations are more than the number of time series. Sargent and Sims (1977) in their study, two dynamic factors explain and represent the major characteristics of the quarterly macroeconomic variables like employment, output and prices of the United States. Further, Giannone et al. (2004) confirmed empirically, the capability of a small number of factors in explaining the variance of numerous macroeconomic series. Barhoumi et al. (2018) also suggest that DFMs can condense the information contained in numerous variables into a small number of factors common to the set of variables. DFM models have the effect of factors, f_t , on x_t through their lags. Hence, DFM for time series relies majorly on the assumption of the autoregressive nature of the factors and can be stated as a Gaussian linear state-space model, popularly known as Dynamic Linear Models. The static form of DFM be expressed as:

$$x_t = \Lambda f_t + e_t \tag{2.9}$$

$$f_t = \Phi f_{t-1} + u_t \tag{2.10}$$

Where, x_t of the dimension $(t \times n)$; Λ is the weighting matrix of dimension $(n \times m)$, and common factor,f of the dimension $(t \times m)$.

The premise of a dynamic factor model is that a few latent dynamic factors, f_t , drive the comovement of a high-dimensional vector of time-series variables, x_t which is also affected by a vector of mean-zero idiosyncratic disturbances, *e*. These idiosyncratic disturbances arise from measurement error and from special features that are specific to an individual series. The

latent factor allows a time series process, which is commonly taken to be a Vector Auto Regression (VAR). The DFM is given by:

$$X_{it} = \lambda_i(L)F_t + e_{it} \tag{2.11}$$

$$y_{t+1} = \beta(L)F_t + \epsilon_{t+1} \tag{2.12}$$

Where, y_t represents the time series that is to be forecasted; X_t is N-dimensional multiple time series of predictors; $\lambda_i(L)$ and $\beta(L)$ are polynomials of degree s , and L is the lag operator such that for all $s, L^s F_t = F_{t-s}$; e_{it} represents the idiosyncratic disturbance; f_t and e_t are assumed to be stationary processes with mean zero. Hence, X_t and y_t are deviations from their means. Given the condition above, X_t is independent of each other, but X_t is dependent only on F_t.

The central assumption of the state-space model is that F_t depends on its lagged values only through F_{t-1} and hence $\{F_t, t = 0, 1, \dots\}$ is a Markov chain. This implies that the probability of F_t belonging to a regime date t depends only on the probability of being in a particular regime during $t-1$, i.e., $P(F_t|F_{t-1}, F_{t-2}, F_{t-3}, \dots) = P(F_t|F_{t-1})$. Various techniques like Maximum likelihood and Bayesian methodology can be used to estimate the models.

2.5.3 Dynamic Hierarchical Factor Model (DHFM)

DFMs can be estimated in time -domain. For this, they can be apportioned into three generations. Stock and Watson (2010) highlights the three generations in evolution and estimation of factor modelling. The first generation entails small-sized parametric models evaluated using Gaussian Maximum Likelihood Estimation and Kalman filter (Engle and Watson 1983) (Stock and Watson 1989). However, the implementation of the approach is

subject to the number of the parameters and the number of the series. The approach confines its Application to a smaller number of series and can handle data irregularities.

The second generation of estimators is applied to large N applying non-parametric estimations (Stock and Watson, 2002a). Its precision of the estimation of factors relies on the richness of the vast data and builds estimations based on the principal component estimator. Both generalized and dynamic principal component estimation is used in second-generation models. The third generation estimates the parameters of the state-space models employed in the first generation, using non-parametric estimations of robust hybrid principal components and state-space models (Giannoni et al. 2008). It solves the dimensionality problem. Over the three generations of the models, the performance of principal components estimators has been analyzed. While Forni et al. (2005) find generalized principal component estimator to be meticulous than the principal components. In comparison, Biovin and Ng (2005) don't find a significant difference between the two approaches. However, to estimate the parameters and factors, Application of Bayesian methods have also been suggested over.

Maximum likelihood on the grounds that it allows specifying a-priori information on the models in the form of a prior distribution. Bayesian methods also allow easier integration to compute posterior using MCMC methods, particularly for the models that contain nonlinear and non-Gaussian elements. Chib and Greenberg (1996) explain Application of Gibbs sampling to Linear or Gaussian state-space models. Otrok and Whiteman (1996) estimate one dynamic factor using four variables, providing the earliest Application of Bayesian methods in estimating linear/ Gaussian DFM in state space. Further, Kose, Otrok and Whiteman (2008) exemplify international comovement with the international transmission of economic shocks using Bayesian estimations. MCMC methods were introduced by Metropolis et al. and Geman and Geman added it in the form of Gibbs sampler. MCMC has been used by Boivin and

Giannoni (2006) to estimate the parameters of dynamic stochastic general equilibrium. Carlin, Polson and Stoffer (1992) outline the MCMC application for nonlinear/ nonGaussian state-space model.

Multilevel model is an extension of DFM and is fragmented into three parts, first, an observation equation that explains the distribution of the observations via a regression model, second, the structural equation, explaining the structure of hierarchy of the regression parameters and third, the system equation explaining the evolution of parameters through time. The three equations are as follows:

Observation equation: $$y_t = X_{1t}\beta_{1,t} + v_{1t} \qquad v_{1t} \sim \mathrm{N}_n\,(0, V_{1t}\,) \tag{2.13}$$

Structural equation: $$\beta_{1,t} = X_{2t}\beta_{2,t} + v_{2t} \qquad v_{2t} \sim \mathrm{N}_{r1}\,(0, V_{2t}\,) \tag{2.14}$$

$$\beta_{2,t} = X_{3t}\beta_{3,t} + v_{3t} \qquad v_{3t} \sim \mathrm{N}_{r2}\,(0, V_{3t}\,) \tag{2.15}$$

System equation: $$\beta_{3,t} = G_t\beta_{3,t-1} + \omega_t \qquad \omega_t \sim \mathrm{N}_{r3}\,(0, W_t\,) \tag{2.16}$$

Where n is the total number of observation, v_{1t}, v_{2t}, v_{3t} and ω_t are the idiosyncratic component or the disturbance terms and are independent; X_{1t}, X_{2t} ,X_{3t} and G_t are the matrices for explanatory variables; V_{1t}, V_{2t}, V_{3t} and W_t represent the variance-covariance matrices, $\beta_{1,t}, \beta_{2,t}, \beta_{3,t}, \beta_{3,t-1}$ are the coefficients.

DHFMs were introduced by Gamerman and Migon (1993) as an extension of the two-level model of Sargent and Sims. A hierarchical model can have a different number of levels. For the study, we follow the four-level hierarchical model proposed by Moench et al. (2011). The model allows for using large datasets and constructs the models as per the structure of the data, allowing a clear path for interpretation. Moench et al. assert on organizing the data into blocks and distinguish the factors evaluated for each block. The block-level factors are modelled in

the higher-level equation. Using the model, it is easy to capture the within and between block variations. The model is generalized as (using the same notations as from Moench et al.). The study used a four-level model that allows us to split the causes of dynamics into four major categories that are, idiosyncratic, common, block specific and sub-block specific components. DHFM serve as in ideal too to disentangle the relative importance of block and sub-block specific factors. The hierarchical structure suggests that the subblock level factors hinge on superordinated factors, and these interdependencies are considered during estimation. The dynamic hierarchical factor model is built up using MCMC methods. Iteratively, first, each factor is drawn, given the parameters, the other factors. In a second step, parameters are drawn based upon the obtained factors.

2.5.4 Application

Based on the model researchers have been done to find the degree of comovement among various factors. Nagayasu (2013) investigates and quantifies the interdependence of real effective exchange rates. Using DHFM, he decomposes the exchange rate movements in world-level, country-specific and regional level factors; however, suggests country-specific factors to explain the significant variations in the exchange rates. Forster and Tillmann (2014) estimate the degree of international comovement of inflation rates using DHFM by decomposing Consumer Price Index (CPI) into a country-specific component, country group-specific factor, the common factor to all inflation series of all the countries and factor specific to a specific sub-section of CPI. The Hierarchical nature allows the global factors to impact the country-group factors and other factors at a lower level of the hierarchy but not vice-versa. The authors conclude that country-specific factors bring out most of the volatility in inflation. Zhiming, Yongji and Peng (2014) explain the degree of global cyclical interdependence. Modelling 169 countries into three groups, namely, industrial, emerging and other economies, they use DHFM

to decompose macroeconomic fluctuations in output, consumption and income into different factors. Their result shows that the spill over effects of the global business cycle for emerging economies and other economies are weaker than that of industrial economies. Dehmamy and Halberstadt (2015) investigate the US yield curve dynamics from macroeconomic data. DHFM distinguishes the movements of the data that is common for the economy and that is specific to sectors. They conclude economy-wide factors to explain the macroeconomic dynamics reflecting the yield curve variations, whereas sector-specific factors have little role to play.

Kiselev and Zhivaykina (2019) examine the impact of changes in the global relative prices on domestic inflation. Literature linked to economic variables demonstrated how time series models could be used to estimate time-varying regression. Measuring the prediction-based globalization effect can explain the responsiveness of a country to global innovations. An attempt like this has been made by Reklaite (2015) suggesting a globalization measure for Lithuania, which reflects the portion of economic growth explained by foreign indicators has been increasing over time. In doing so, she uses the dynamic hierarchical factor model to estimate the factor loadings of domestic and foreign factors and using the resultant in a dynamic linear model setting. The model used in the present study is closely related to this model. However, she has not deciphered the relevance of the idiosyncratic component and how common factors are suggesting the comovement in the domestic and foreign blocks.

Further, to provide the empirical estimates of the dynamic structure of the economic growth, we use the TVP-R estimations to gauge the time-varying coefficients of domestic and foreign factors. The parameters are estimated using the standard Kalman filter for a linear Gaussian state space model following (Cargnoni et al., 1997). Our analysis is based on TVP-R model using estimation package as suggested by Nakajima (2011). The coefficients so obtained can explain the movements in growth rates are in line with the dynamics of the domestic and foreign

leading indicators. Bhattacharya et al. (2019) in forecasting GDP growth in India uses Time Varying Parameter Regression (TVPR) approach and in consensus with Inoue et al. (2017) and Karakatsani and Bunn (2008) suggest that time-varying parameter estimations outperform other constant parameter models to gauge the unobserved structural changes in an economy using rolling windows and Kalman filtering technique respectively.

2.6 Time-Varying Parameter Estimations

The dynamics of the growth and globalization are of particular interest to both the researchers and policy-makers. Stock and Watson (1989) suggested that reference cycles can be measured by observing the co-movements of various indicators, given by one standard unobserved variable. They introduced the model to gauge the unobserved variable that represents the "current state of the economy". Engle and Watson (1981), Geweke (1977) and Sargent and Sims (1977) suggest DFM estimate the unobserved variables. Researchers like Mendez et al. (2001) have employed DFM to capture and forecast the GDP growth rate of European countries based on Automatic Leading Indicator model.

We use the time-varying estimations to gauge the time-varying coefficients of domestic and foreign factors. Bhattacharya et al. (2019) in forecasting GDP growth uses TVPR approach and suggest that TVPR model outperforms the conventional constant parameter models. TVP-VAR model was introduced by Primiceri (2005). The model since then has been used in investigating the dynamics of various macroeconomics phenomenon. The author suggested that the model can apprehend the time-varying characteristics of the economy in a more robust manner using stochastic volatility. Black (1976) proposed the phenomenon of Stochastic volatility which is very crucial for TVP- VAR models. Models using stochastic volatility are proved superior over those with constant volatility. Constant volatility ignores the possible variation of volatility in disturbances. TVP-VAR estimations are widely used after Cogley and

Sargent (2001) proposed the analysis of the time-varying structure of using unemployment, inflation and nominal short-term interest rates in a three-variable VAR model. Later in 2005, Cogley and Sargent introduced stochastic volatility in the TVP-VAR model with non-varying structural shock. Primiceri (2005) enriched the model, allowing all the parameters to vary over time. The model is used for examining the dynamics of inflation and output growth in the US by Canova et al. (2018). Nakajima et al. (2010, 2011) studied the macroeconomic data of Japan using TVP-Var model. Baumeister et al. (2008) examined the impact of excess liquidity shocks on macroeconomic dynamics in the euro area. Prieto et al. (2016) used Bayesian time-varying parameter estimation to suggest that during the crisis period, the transmission of the effects of the shock from the financial time series transmit to the real economy. We address a similar phenomenon but with respect to shocks in the foreign sector and the domestic sector.

Our analysis is, however, based on Primiceri (2005)'s TVP-VAR model using estimation package as suggested by Nakajima (2011). The coefficients so obtained can explain the movements in growth rates and are also in line with the dynamics of the domestic and foreign leading indicators.

Inoue et al. (2017) and Karakatsani and Bunn (2008) suggest that time-varying parameter estimations outperform other constant parameter models to gauge the unobserved structural changes in an economy using rolling windows and Kalman filtering technique respectively. Eickmeier and Lemke (2015) and Su and Wang (2017) augmented the time-varying parameter models with principal components to capture the estimations from a large pool of indicators than selecting a limited set of indicators. Our study tries to examine the turning points and GDP growth rate using time-varying parameter estimations on the facto induced domestic and foreign factors obtained from the factor model. We compare the performance of each model.

CHAPTER 3- RESEARCH METHODOLGY

3.1 Introduction

The chapter discusses the overview of the research problems and highlights the research gaps identified based on the literature review. This section is followed by the research questions and research objectives framed based on the suggested research gaps. Next Section discusses the significance of the study, followed by a discussion on the research methodology adopted and various steps of research undertaken. The chapter mention the ethical considerations kept in mind while undertaking the research. Going ahead, the chapter discusses the variables used in the study and the sources of collecting the data. Further, the methodological framework for each objective is laid down, explaining the study tools and techniques used to provide the solutions to the research objectives.

3.2 Problem Overview and Research Gaps

Thirty years of globalization have bolstered India's exports. While globalization has been a contributor to India's growth, experiments with globalization have been regional, not global. The link between globalization and economic growth is getting complex as the propagators of globalization are opting protectionism. The crisis and the ensuing recession have led global leaders to focus inwards. While the trend had taken off with countries having to face rising inequality and a focus towards self-development, there is little evidence besides newspaper articles to support this hypothesis from the Indian perspective. It hence is imperative to delve into the study of dynamics of globalization in Indian context empirically. The extensive research of the relevant literature suggests the following research gaps:

i. The relationship between globalization, trade and growth has been estimated differently by various authors. The inconsistency in the results from the researchers paves the path for further research in this area.

ii. Very few studies are available which assess the impact of globalization on Indian's foreign trade using a panel of 154 trading partners of India. The existing studies employ data from the top few trading partners.

iii. There is hardly an empirical investigation of the trend of slowbalization in India.

iv. The studies which attempt to measure the extent of globalization in the Indian economy rely heavily on synthetic indices. However, no study in the Indian context has used the Leading Economic Indicator approach and Dynamic Hierarchical Factor Model for assessing the globalization measure.

v. The existing studies fail to capture the impact of domestic and foreign factors separately and also, their relationship with each other.

vi. Fewer studies assess the time-varying domestic and foreign loading on the future growth of the economy.

3.3 Research Questions

i. Is there any significant relationship between international trade, globalization and economic growth in the Indian context?

ii. How globalization affects the merchandise exports from India?

iii. Is the Indian economy heading towards de-globalization or slowbalization?

iv. Can domestic and foreign leading factors suggest the globalization measure in the Indian context?

v. Can the portion of economic growth driven by foreign and domestic factors be measured?

vi. Do time-varying parameter estimations are able to suggest the realistic pattern of globalization viz-a-viz, static estimates?

3.4 Research Objectives

Primary Objective: To understand the dynamics of globalization in India.

Specific Objectives

i. Investigate the relationship between globalization, International Trade and economic growth of India.
ii. Assess the impact of globalization on merchandise exports of India.
iii. Investigate whether the portion of economic growth explained by foreign factors is decreasing to suggest the evidence of slowbalization for Indian economy.
iv. Estimate the time-varying dimensions of globalization effect.

3.5 Research Methodology

This section discusses the steps of research undertaken to provide solutions to the research problem. Research methodology suggests the systematic approach adopted by researchers to find solutions to the research problem. As Hussain (2011) explains, the research methodology enables the researcher to develop the plan of action to guide them in the various staged of research. We present the research methodology using the "Research Onion". Research Onion was developed any proposed by Saunders et al. (2007) fragmenting the phases for developing the research strategies. Each layer of the research onion provides an evolution of stages of research to design methodology. The model has widely used information about the theoretical framework of the study. Bryman (2012) advocates that the model is suitable for most contexts and can be adapted to suit any study. Raithatha (2017) suggests research onion can be used as an academic research model as it guides step-by-step research process. We, however, use the

seven layers research onion proposed by Melnikovas (2018) adapted from the six-layer research onion of Saunders et al. (2016). The adapted version accommodates for the "future research" thus forming a coherent research onion model for futures studies (Figure 3.1). Patomaki (2006) claims that anticipation of the future is an integral aspect of studies in social sciences to be of importance in the contemporary environment. Melnikovas (2018) added layer "Layer 2: Approaches of futures research" to propose a comprehensive model for future studies. The seven layers are namely, Research Philosophy; Approaches of future research; approaches to theory development; research strategy; methodological choice; time horizons and finally the techniques and procedures. The layers can be explained as follows:

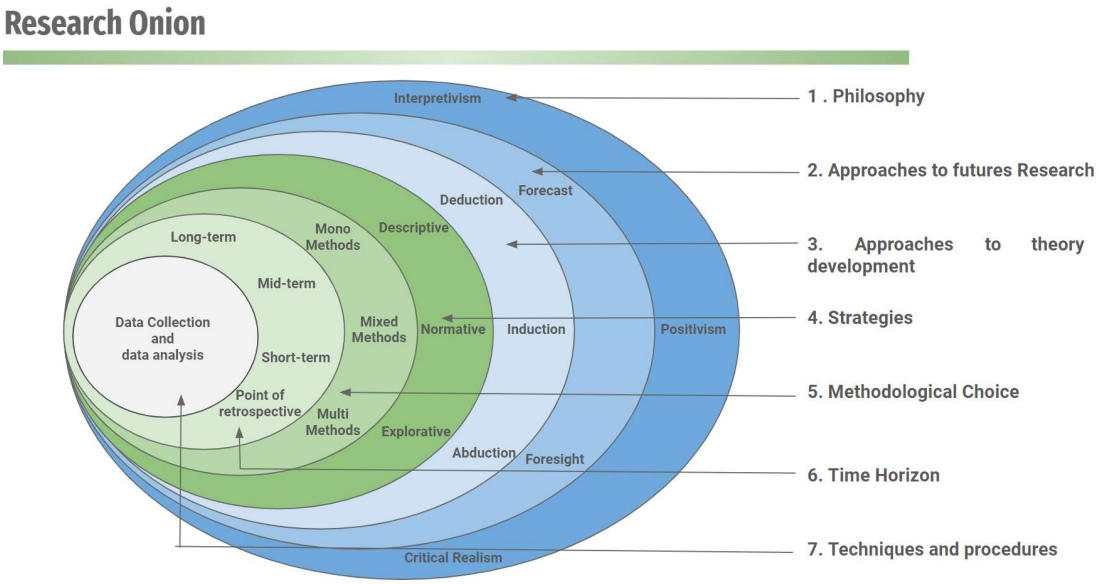

Figure 3.1 Research Onion

Layer 1: Research Philosophy

The research philosophy provides the assumptions, perceptions and beliefs that aid the researcher in building knowledge. The core parameters of research philosophy are a collection of data, selection of research method, data analysis and application of the knowledge. The type of research philosophy focuses on the research questions, or the theory is proposing. The two

classical philosophies are *positivist*, and *interpretiv*e and contemporary philosophies include *critical realist.* Saunders et al. (2016) admit that choosing between positive or interpretive position may be unrealistic.

Positivism explains the phenomenon that reality is stable, it can be observed and described from an objective viewpoint, but it cannot be changed (Levin, 1988). The researcher's role is limited to the collection of data and its interpretation. Behaviour, beliefs and values do not influence the observations of the researchers, and hence there is less subjectivity. Accordingly, the generalization principle applies that reality can be experimented, tested and expanded. *Interpretivism, also known as social constructivism,* on the contrary, is anti-positivism which claims that truth evolves continuously and is constructed socially (Galliers, 1991). Hence, knowledge and facts are based on subjectivity, that is, the results are based on situations, and the researcher's values and beliefs impact the propositions. Bhaskar (2008) proposed the theory of *critical realism*, conjoining the notion of transcendental realism and critical naturalism. He explains that social phenomenon is causal as well as interpretive, and hence, critical realism combines positivism and interpretivism. Critical realism provides an explanation and understanding. For empirical observations, causality is essential to be understood to explore the hidden causal mechanisms, to eventually bridge explanation and understanding. Critical realism is based on two assumptions, as suggested by Saunders et al. (2016). Firstly, the world comprises of real entities and secondly, we can recognize only the reflections of these entities and not the actual entities. To this, Kosow and Gaber (2008) suggest that the future can be identified in three ways, it can be predicted, it grows, and future is malleable and not determined and hence can be influenced. In the context of the future studies, Inayatullah (2013) suggests that positivism Philosophy assumes the deterministic nature of the future, that future can be perceived, predicted and controlled. Based on the past and present events, future events can be gauged. Further, he explains that interpretive philosophy is based broadly on the insight

and assumes unpredictability of the future. Whereas the critical realism philosophy takes the flexibility of future, claiming that there is the possibility of the presence of multiple futures rather than just one. The idea of various futures enables exploration of causal mechanisms and constructing possible scenarios for the future.

This study relies mainly on *Critical realism*. Efforts are done to present the dynamics of globalization distinguishing the era of the golden age of globalization to the era of sluggishness and hence forecasting multiple possibilities in the form of an increase in globalization and going into the reversal. The change in the dynamics of globalization is influenced from the present.

Layer 2: Approaches to futures research

Quantitative *forecasting* and *foresight* are two approaches to study the future, where the former is based on econometric and mathematical modelling, and the latter suggests an alternative future referring to the notion of multiple futures. Kosow and Gabner (2008) indicate that forecasting approach is followed in the studies where quantitative data is available and aims to predict the actual future event, and foresight approach allows developing cognitive-analytical view of complex multiple futures. This study makes an attempt to forecast the multiple dimensions of globalization based on quantitative data analysis and hence has a forecast approach for future research is adopted.

Layer 3: Approaches to theory development

Saunders et al. (2016) suggest three approaches to theory development- inductive, deductive and abductive. Inductive reasoning is a *theory-building* approach, where the researchers initiate with an idea, develops the hypotheses and concludes based on data analysis. It is a bottom-up approach based on structural categorization. Deductive reasoning, on the contrary,

is a top-down approach usually used for *theory testing*. The method entails the research process, which works on predefined hypothesis and conclusions, which are proved either true or false. Kuosa (2011) highlights that in future studies, inductive reasoning is based on intuitive techniques and deductive reasoning is based on physical argumentation. Though both inductive and deductive reasoning is widely used in the literature for future studies, Kuosa (2011) reflects a swing towards using *abductive r*easoning. Paavola et al. (2006) explain the abductive reason as the approach of best guess and conclusion based on the available evidence. The approach builds up the inferences and findings from the observation of clue-like signs, which also serves as the ground idea of future research. The approach is based on cognitive argumentation. Both inductive and deductive approaches are based on the past probabilities; the abductive approach performs on identifying the slightest symptoms of ideas and changes and draws conclusions from low knowledge.

The study forms abductive reasoning. In the context of globalization, there are no predefined theories relating to our primary objective. There are assumptions, ideas, conceptions and misconceptions regarding the change in the dynamics of globalization the proposed theory of slowbalization is a form of inference, starting with the observation of clue-like signs, which provide the basic notion for further research. The conclusions drawn from this would lead to the innovation of new concepts like slowbalization.

Layer 4: Research Strategy

Saunders et al. (2016) suggest an experiment, survey, case study, action research, grounded theory and ethnography as the research strategies available with researchers. The researcher selects the strategy to choose the method of data collection and the methods used to find solutions for research questions. *Experimental research* is mostly used in natural sciences by directly creating links between dependent and independent variables and interpreting, as

suggested by the expected research outcomes. *Survey strategy* can be used in the case of quantitative and qualitative data using descriptive and inferential statistics. A representative sample from the population is used to capture the thoughts, beliefs and ideas of the respondents via interviews and questionnaires. *The case study* is most often used in explanatory and exploratory research. The case study method banks on both the qualitative and quantitative data. Robso (2002) defines it as "empirical investigation of any contemporary phenomenon within its real-life context using multiple sources of evidence."

Action Research is based on the reflective process, assessing the practice and experience while researching the system. The researcher evaluates how they can propagate their understanding and professional approach. *Grounded theory* is a systematic and qualitative approach where theory is generated by a series of observations from the data collected rather than fitting it to any existing framework. The predictions based on the data are then tested further. *Ethnography* research strategy requires close interaction and inspection of people and hence is very time-consuming. The perspectives of the people observed form an understanding of the new patterns of thoughts. *Archival research*, also known as historical research entails the use of records of data, surveys, case studies are the sources of data.

List (2005) proposes two types of research strategies in the context of future studies, namely, *quantitative* and *qualitative*. Kosow and gabener (2008) mention *descriptive,* normative *(prescriptive)* and *explorative* strategies. Explorative methods study multiple futures and explore the possibilities of each future. Normative approach, on the other hand, works towards building the pathways to reach the objective. In future studies, the researcher first aims to describe the patterns of future development, prescribe the actions to achieve the desired future and finally explore the possible future developments.

The present study is an exploratory study that uses quantitative methods with grounded theory and case study methodology as the research strategies. Explorative methods are aimed at studying multiple futures and exploration of possible developments.

Layer 5: Choices of Data Collection Techniques

Three data collection techniques are available for a researcher, mono-method, mixed-methods and multiple-methods. In *Mono-method*, either the quantitative or techniques are employed. *For mixed-methods,* however, uses both quantitative and qualitative approaches for data collection. *Multi methods* refer to the technique where more than one data collection method is used.

This study is a multi-method study as an attempt is made to use a few quantitative methods and a case study method to propose the results of the investigation. The research is primarily based on the quantitative method, and the case study based on qualitative data is used as a supplementary method to provide the results.

Layer 6: Time Horizons

Saunders et al. (2011) suggest Cross-sectional and longitudinal studies as the two types of time horizons. In longitudinal studies, the researcher observes the phenomenon over some time. In the case of cross-section studies, the researches observe a phenomenon at a point of time while controlling over variables. In terms of future studies, Kosow and Gabner (2008) suggest three-time horizons – short term – up to ten years; medium-term – up to 25 years and long term – more than 25 years.

The study relies on long term time horizons where the data employed is used for more than 25 years. Also, the study employs both time series and panel data (a combination of cross-sectional and time series).

Layer 7: Techniques and procedures

The last layer of techniques and procedures entails the data collection and data analysis procedures. The study is based on the following dimensions:

i. *Research Design:* Descriptive research design
ii. *Type of research:* Empirical Research
iii. *Data Collection:* Secondary sources: internet, websites, books and journals
iv. *Geographical Area of Research:* India
v. *Sample size:* Vary over each objective
vi. *Data analysis:* Time series, Panel estimations and Factor modelling are employed.

3.6 Ethical practices in the study

Ethical considerations are a critical part of the study as it helps the researcher to understand the right and wrong practices. The research has been conducting in the fairest manner. No copied content is used in the presented study. In-text citations are used, giving due credit to the authors, and proper references have been mentioned. No one was forced or involved in the process of data collection. No practices against the law have been exercised. No harm is caused to nature or public property while conducting the study.

3.7 Variables and Data Sources

Objective 1: Investigate the relationship between globalization, International Trade and economic growth of India.

Annual time series data of India for 37 years (1980-2016) is used with a structural break in the year 1991, tested using the Chow test. Economic growth is measured using the Real Gross Domestic Product. To measure trade, total trade volume (that is, both imports and exports) is

used. The data for RGDP and trade volumes are collected from UNCTAD data centre. The overall KOF Globalization Index is calculated by combining de facto and de jure indices. The data is procured from ETH Zurich website. The globalization index is augmented to cater to the simultaneity issue. The components that are removed from the index are Actual Flows (constitutes 50% of the economic globalization); Transfers, Trade-in newspapers and trade in books from the social globalization Index. The remaining components have been used to recalibrate the index using the same weight as assigned earlier (Table 3.1)

Objective 2: Assess the impact of globalization on merchandise exports of India.

The annual data for 154 trading partners of India (List mentioned in Table 3.2), which accounts for more than 95% of the total volume of exports, from 1991 to 2017 is assessed for this study. 2017 is considered as the end-year owing to the paucity of the KoF globalization index beyond 2017. Conventionally, bilateral trade is taken as the dependent variable. However, the current study uses merchandise export values as the dependent variable. Nominal GDP of India and trading partners measure the economic size, for which the data is collected from the International Monetary Fund (IMF) database. The population is used as a proxy for market size. There is an ambiguity in the expectation of the sign of the coefficient of population. A larger population means a broader domestic market and a higher degree of domestic demand, as suggested by Hatab et al. (2010). At the same time, the other opinion suggests that when the population is large, production can be increased, and hence more export is possible (Bai 2012). The data on the population is collected from the World Bank.

To measure globalization, KoF globalization index is used. The KoF globalization index measures globalization across the dimensions of economic, social, and political parameters. Data for which is collected from the KoF Swiss Economic Institute. While using the KoF index of globalization, endogeneity becomes a concern as the de facto dimension of the index is

largely based on the exports as a percentage of GDP. The KoF index is augmented by removing three components from the index, namely, trade in goods from trade globalization, high technology exports from informational globalization and trade in cultural goods from cultural globalization which contributes 6.81, 3.74 and 2.51 per cent to the total index, respectively. The exchange rate is represented in the form of the ratio of the value of the Indian rupee and US dollar to the value of foreign currency and US dollar in the year t from World Bank data. The exchange rate is expected to be positively related to the exports as the devaluation of the home currency makes imports expensive and exports cheaper. To account for the degree of dissimilarity among the trading partners, a component of Linder is used. Linder suggests the Log of the share of absolute difference in per capita GDP of the trading partners from aggregate per capita GDP, which is given by Linder = Log (| $PCGDP_i$ – $PCGDP_j$ | / $PCGDP_i$ + $PCGDP_j$)

Linder's theory, also known as "theory of overlapping demand," suggests that usually the production of goods is driven by domestic demand and the surplus of such products is exported. The theory, thus, indicates that nations with a similar level of development (measured by per capita income) have overlapping demand structure and tend to demand similar goods. For the Linder hypothesis to hold, the coefficient should be significant and negative. On the contrary, the Heckscher-Olin theory suggests that countries with a similar level of output trade less because of identical factor endowments. Transportation cost is an integral part of the gravity model of trade. Since transport cost is proportional to the distance, it is often proxied with the use of distance. Batra (2006) and Bhattacharya and Banerjee (2006) have validated these results for the Indian economy. The distance puzzle also accounts for the debate between "Footloose" and "beachhead" hypotheses. The former suggests that exporters inhibit from the distant markets. The latter views that export does not abdicate a distant market as it is hard to gain market share in distant countries. To swamp shortcoming of distance, transport cost is measured in terms of cost-insurance-freight (c.i.f.) to free-on-board prices(f.o.b.) along with

the dummy variables as used in Baier and Bergstrand (2001) (IFS Yearbook 1995). Countries differ in the c.i.f./f.o.b. ratios due to differences in shipping cost, the difference in commodity mix, differences in the quality of port administration, overland transport cost, and proximity of markets from ports. The study uses the shipping cost as defined by Radelet and Sachs (1998), which is given as follows:

$$\text{Shipping Cost} = (\text{c.i.f./f.o.b.}) - 1 \tag{3.1}$$

Dummies can asseverate the inconspicuous heterogeneity between countries and time. Hornok (2011), however, argues that dummies absorb variation in data and hence hidden information in data can be lost due to the use of dummies. The dummy variables used, account for historical factors like countries belonging to the same colonies, shared borders, borderland location, memberships in RTA, common language and crisis hit years. The existence of an RTA among two countries is likely to increase the trade flows between them. RTAs may not be exogenous as there is a causal link between the formation of RTA and the trade flows. Shared language may reduce certain barriers to trade, and it helps aid the trade negotiations. Hummel (2007) points out that approximately 23% of the world trade happens between the adjacent countries. The shared border is expected to be positively related to trade. This variable helps to analyze the distance effect in detail. It takes the value as one if the trading partners share the border with India and zero, otherwise. Landlocked countries may have to pay high overland transport which adds to the overall shipping cost. To account for crisis years, the dummy for 1998-99, 2008-10 are used. Following Arvis and Shephard (2013), all the variables included in the model are in nominal terms as they are deflated by the price indexes captured by the MRTs. Based on the advantages of PPML suggested by the literature, PPML is employed to analyze the data. It takes into account multilateral resistances, endogeneity of FTA, zero trade values and heteroskedasticity.

Further, the additive property of the PPML estimator ensures that the gravity FEs are identical to their corresponding structural terms (Fally, 2015).

Objective 3: Investigate whether the portion of economic growth explained by foreign factors is decreasing to suggest the evidence of slowbalization for Indian economy.

The quarterly rate of growth of the Real GDP (measured with respect to change from the previous quarter of the same year) of India is used to measure the growth of the economy, for which the data is collected from Reserve Bank of India (RBI) website. The main objective of the study is assessing the portion of domestic growth measured by domestic and foreign indicators. Leading Economic Indicators (LEIs) of top 21 trading partners that constitute more than two-third of India's total trade volume (Commerce.gov.in, 2019 statistics) are used. The series is identified based on the LEIs as suggested by OECD, NBER and the central banks of the respective economies. The initial data set consisted of 391 leading foreign indicators of 21 trading partners of India and 21 domestic indicators, which were identified from the OECD database, the Conference Board and the CEIC database. The series reflects dynamics from various aspects like share price index, business confidence index, consumer confidence index, purchasing power, labour productivity, interest rates, etc. The series in the data set are quarterly and seasonally adjusted using X-13 ARIMA- SEATS method covering a period of 94 quarters, from quarter 2:1996- quarter 3:2019. Their respective country's GDP standardizes the data series to avoid any biased estimation due to the large size of the economies. Data are stationary and normalized with zero mean and unit variance. The period of the study is from 1996, as the quarterly GDP data for India is unavailable before this period. The long duration of the data encompasses the period of the Asian crisis and GFC which had strategic implications to the Indian economy. The model requires stationarity of the data; hence, the presence of unit root using the Augmented Dickey–Fuller (ADF) test is checked. The non-stationary series were

eliminated from the model, and only the series stationary at 5 per cent or 1 per cent significance level were used.

Objective 4: Estimate the time-varying dimensions of globalization effect.

The output of objective 3, that gives the common factors, domestic and foreign factors, which serve as the input variables for this objective. The factor-induced foreign and domestic loadings are regressed on the GDP growth of India of next period. This shall help us determine the portion of growth explained by the domestic factors and the portion of growth that is driven by foreign factors.

3.8 Methodological Framework

Objective 1: **To investigate the relationship between globalization, International Trade and economic growth of India.**

Software Used: EVIEWS 9.5

Analysis Technique used

To understand the relationship between globalization, international trade and economic growth, firstly, chow test is undertaken with a known breakpoint at the year 1991. Chow test confirms the presence of a structural break in GDP as well as in the trade volume in the year 1991. Time series data tend to show a trend and is usually non-stationary (Gujarati & Porter, 2011). Enders (2004) suggests that Dickey- fuller tests have low testing power as compared to the Phillips-Perron test. To check the presence of unit root and stationarity, ADF test of unit root and PP unit root test is used along with the KPSS test for stationarity. The combined use of all the three tests is known as Confirmatory Data Analysis.

As a pre-estimation analysis for Cointegration test, optimal Lag Length is calculated using the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) Lag Length Criteria. Johansen – Cointegration, using Trace Statistics and Eigenvalues statistics, is undertaken to test for the long-run relationship between the variables. Johansen (1995).

VAR models are advanced to examine the interaction among the variables, Sims (1980). However, if the variables are cointegrated, it is suggested to use the Vector Error Correction Model (VECM), which is a restricted version of VAR. The model restrains the long-run propensity of the endogenous variables to concentrate on cointegrating relations by adjusting the dynamics in the short run. The coefficient of the EC term represents the rate of adjustment to short-run variations.

The three equations used for the analysis in the VECM are as follows.

$$\Delta LGDP_t = \alpha_{10} + \sum_{s=1}^{2} \alpha_{11}(s)\Delta LGDP_{t-s} + \sum_{s=1}^{2} \alpha_{12}\Delta LTR_{t-s} + \sum_{s=1}^{2} \alpha_{13}\Delta GI_{t-s} + \gamma_1 EC_{t-1} + \varepsilon_{1t} \quad (3.2)$$

$$\Delta LTR_t = \alpha_{20} + \sum_{s=1}^{2} \alpha_{21}(s)\Delta LGDP_{t-s} + \sum_{s=1}^{2} \alpha_{22}\Delta LTR_{t-s} + \sum_{s=1}^{2} \alpha_{23}\Delta GI_{t-s} + \gamma_2 EC_{t-1} + \varepsilon_{2t} \quad (3.3)$$

$$\Delta GI_t = \alpha_{30} + \sum_{s=1}^{2} \alpha_{31}(s)\Delta LGDP_{t-s} + \sum_{s=1}^{2} \alpha_{32}\Delta LTR_{t-s} + \sum_{s=1}^{2} \alpha_{33}\Delta GI_{t-s} + \gamma_3 EC_{t-1} + \varepsilon_{3t} \quad (3.4)$$

Dynamic Ordinary Least Square (DOLS) estimation with one lead and one lag is also employed to estimate the cointegrating vector that characterizes the long-run relationship among the variables. To make stochastic error term free from all the previous deviations in stochastic regressors, Lead and Lag terms are incorporated in the DOLS estimation. The residuals of the estimated DOLS regression are checked for the presence of unit root and stationarity. Choi et al. (2008) suggest that if the stochastic error is free from the unit root and is stationary, the regression is not spurious.

To check for short-run causality, Wald Test is used, which gives chi-squared statistics of the coefficient on the lagged endogenous variables. Toda and Yamamoto Granger Causality test (1995) is employed to check for the long-run causality. It does not require pre-testing for cointegration and reduce the bias because of the presence of unit root. It is superior over granger causality as Granger causality suffers from the problem of specification bias.

Variance Decomposition is used to represent the responsiveness in a variable due to shock in its own as well as other variables. The technique helps construct an estimation of the size of the prediction error of each variable, based on each of the other variables in the model. The Impulse Response functions finally indicate the direction of transmission of every variable to innovation in other variables, hence suggesting the response path. Causality is studied by tracing out the effect of a stimulus in one variable to other variables.

Objective 2: **To assess the impact of globalization on merchandise exports of India.**

Software Used: STATA 14

Analysis Technique used

Derived from Newton's law of gravity, the gravity model for trade is as follows:

$$\text{Trade}_{ijt}=\beta_1(\text{GDP}_{it}.\ \text{GDP}_{jt}).\ \beta_2(\text{Distance}_{ij}).\ u_{ijt} \quad (3.6)$$

The gravity model of trade explains that the intensity of the bilateral trade between two trading partners is positively related to the countries' size based on GDP and is negatively related to the distance between the two countries. To conduct linear regression, the earlier-mentioned equation is transformed into a natural logarithm form, and the merchandise exports are taken as a dependent variable. With the transformation into log form and addition of dummy variable and error term, the model constructed is as follows:

$$Exports_{ijt} = \beta_0 + \beta_1(GI_{it}) + \beta_2(GI_{jt}) + \beta_3 Ln\,(GDPit) + \beta 4\,Ln\,(GDPjt) +$$
$$\beta 5\,Ln\,(Populationit.) + \beta 6\,Ln\,(Populationjt) + \beta 7\,Ln\,(Exchange\ rateijt) +$$
$$\beta 8\,Ln\,(Transportation\ Costijt) + \beta 9\,(Linderijt) + \beta 10\,(D1) + \beta 11\,(D2) + \beta 12(D3) +$$
$$\beta 13\,(D4) + \beta 14\,(D5) + \varepsilon ijt \qquad (3.7)$$

Where, t: time period of sample data;

i: exporter country (India);

j: export destinations;

$Exports_{ijt}$: The export volume from India to country j in time t;

GI_{it}: India's globalization index in time t;

GI_{jt}: Country j's globalization index in time t;

GDP_{it}: India's GDP in time t;

GDP_{jt}: Country j's GDP in time t;

$Population_{it}$: Population of India in time t;

$Population_{jt}$: Population of country j in time t;

$Exchange\ rate_{ijt}$: Real exchange rate of India against the trading partner;

$Transportation\ Cost_{ijt}$: Cost of transporting goods from India to the destination j;

$Linder_{ijt}$: Given by Log ($| PCGDP_i - PCGDP_j | / PCGDP_i + PCGDP_j$);

D_1: Dummy for RTA ($D_1 = 1$ if a country has an RTA with India in time t; $D_1 = 0$, otherwise); for common border (1 if a country has common border with India; 0, otherwise);

D_2: Dummy D_3: Dummy for common language (1 if a country has common language; 0, otherwise);

D_4: Dummy for landlocked countries (1 if a country is landlocked; 0, otherwise);

D_5: Dummy for crisis period (1 if there has been a crisis situation in that year; 0, otherwise)

ε_{ijt}: Error term.

The coefficients are anticipated to have either a positive or negative sign depending on the variables' incidence of exports.

The model is estimated using PPML estimator. Head and Mayer (2014) suggest examining other generalized linear models. OLS, Panel FEs, and GPML estimations are used for robustness check. The interval-based estimations for 3-year, 4-year and 5-year intervals are also undertaken. Olivero and Yotov (2012) also use different FEs to check for the robustness of the results. Finally, model (4) is used for further estimations. Once the model is estimated, the study prognosticates the trade with all trading partners to evaluate the export potential (P). The method of the average speed of convergence (SC), suggested by Jakab et al. (2001) is used to capture the export potential. The average speed of convergence is given by:

$$SC = \left(\frac{Averagegrowthrateofpotentialtrad}{AveragegrowthrateofActualtr}\right)*100\text{-}100 \quad (3.8)$$

In comparison to measuring the export potential at a point of time, this method is more appropriate. SC will be negative if the growth rate of the potential export is lower than that of the actual export, which reflects convergence. The difference between potential export and actual export, ΔT, is also calculated. To calculate ΔT, an average of exports from the post-crisis period is considered to avoid skewness. If both SC and ΔT have opposite signs, it suggests convergence between the potential export and actual export, and same signs indicate

divergence. To determine the nature of India's exports, the study intends to create a fundamental distinction based on distance. If a country trades more within its continent, the study describes it as a narrow approach to globalization.

On the other hand, if the trade is more with other continents, the nature of trade is broad. The countries are grouped into seven regions, as suggested by the World Bank geographical classification of countries. As the speed of convergence and ratio of convergence (derived and explained above) point to the nature of a country's trade, the nature of the country's globalization and the way ahead can be explained.

Objective 3: Investigate whether the portion of economic growth explained by foreign factors is decreasing to suggest the evidence of slowbalization for Indian economy.

Software Used: MATLAB 14 and OCTAVE 5.2.0

Analysis Technique used

The leading macro-economic indicators are selected following Fritsche and Stephan (2000) and Gaudreault et al. (2003). First, Granger Causality from the leading indicator series (X_{it}) to the GDP growth in the next period (ΔGDP_{t+1}). Secondly, the correlation between X_{it} and $\Delta GDP_{t+1\ with}$ lags, $l > 0$. Only those series were selected for modelling which

(a) had at least unidirectional causality from X_{it} to ΔGDP_{t+1};

(b) the correlation between X_{it} and $\Delta GDP_{t+1\ with}$ lags, $l > 0$ was between -1 to -0.3 or 0.3 to 1, suggesting either a negative or positive correlation, eliminating the series indicating weak correlations. The series so obtained was organized into two blocks, domestic and foreign. The domestic block consists of 11 domestic series, and foreign block consists of 75 foreign series, which is further divided into six sub-blocks (world bank suggested regional classification of

economies). The latent factors for foreign and domestic blocks are evaluated using this specification which is further used to evaluate their respective load on the growth of the economy. The model is structured in a four-level dynamic hierarchical factor model. The block structure provides a parsimonious way to allow for covariations that are not sufficiently pervasive to be treated as common factors. The model uses the same notations as used by Moench et al. (2013) is represented as follows:

$$Z_{bsnt} = \Lambda_{H.bsi}(L)H_{bst} + e_{Zbsit} \quad \Psi_{Z.bsi}(L)e_{Zbsit} = \epsilon_{Zbsit} \tag{3.9}$$

$$H_{bst} = \Lambda_{G.bs}(L)G_{bt} + e_{Hbst} \quad \Psi_{H.bs}(L)e_{Hbst} = \epsilon_{Hbst} \tag{3.10}$$

$$G_{bt} = \Lambda_{F.b}(L)F_t + e_{Gbt} \quad \Psi_{G.b}(L)e_{Gbt} = \epsilon_{Gbt} \tag{3.11}$$

$$\psi_{F.k}(L)F_{kt} = \epsilon_{Fkt} \tag{3.12}$$

Where, $b = [1, \dots \dots, N_b]$ are the number of blocks;

$s = [1, \dots \dots, N_s]$ defines the number of sub-blocks in each block;

$i = [1, \dots \dots, N_i]$ is the number of individual time series;

$t = [1, \dots . . T]$ is the time index;

$\Lambda_{H.bsi}, \Lambda_{G.bs}, \Lambda_{F.b}$, are the corresponding factor loadings;

$k =]98[1, \dots . . K_F\ ]$ is the number of common factors.

The blocks and the sub-blocks are decomposed into idiosyncratic shock and common factor that influence the series in that particular block or sub-block respectively. Series within a block are correlated through common factor, F_t and the block specific variations $e_{Gbjt.}$ Whereas, correlations between the blocks are possible on only through the common factor. A distinct

feature of hierarchical structure is that the transition equation at the block level has a time-varying intercept that depends on the factors at the next higher level since the autoregressive dynamics of e_{Gbjt} imply that.

$$\Psi_{G.b}\,(L)G_{\,bt}\; = \Psi_{G.b}\,(L)\Lambda_{F.b}\,(L)F_t\; + \epsilon_{Gbt} \tag{3.13}$$

hence, the block-level transition equation as is

$$G_{\,bt} = \;\alpha_{F.bt}\; + \Psi_{G.b1}G_{\,bt-1} + \;\ldots + \;\Psi_{G.bqGb}G_{\,bt-qGb} + \;+\epsilon_{Gbt} \tag{3.14}$$

Where $\alpha_{F.bt} = \Psi_{G.b}\,(L)\;\Lambda_{F.b}\,(L)F_t$ is correlated across blocks due to F_t.

The equations for the AR model's innovation terms are:

$$\epsilon_{Zbsit}\; \sim \mathcal{N}(0, \sigma^2_{Zbsi}\,)$$

$$\epsilon_{Hbst}\; \sim \mathcal{N}(0, \sigma^2_{Hbs}\,)$$

$$\epsilon_{Gbt}\; \sim \mathcal{N}(0, \sigma^2_{Gb})$$

$$\epsilon_{Ft}\; \sim \mathcal{N}(0, \sigma^2_{F})$$

The principal component method is the easiest method to estimate the parameters. First, H_t can be estimated for each sub-block using principal components, then using the principal component estimates of H_t, G_t can be estimated, and finally, F_t can be estimated using the principal component of G_t. This arrangement gives static factors rather than dynamic factors and does not take into account the interdependence of the parameters on each other. Kose et al. (2003) suggest the use of Gibbs Sampling (a unique set up of MCMC) to estimate the dynamic factors. Hence the DHFM structure is built up using MCMC methods by connecting the factors from equation () and () vertically. Iteratively, first, each factor is drawn, given the parameters. In a second step, parameters are drawn based upon the obtained Factors. For $\Lambda = (\Lambda_H, \Lambda_G, \Lambda_F), \Psi = (\Psi_H, \Psi_G, \Psi_F, \Psi_Z), \Sigma = (\Sigma_H, \Sigma_G, \Sigma_F, \Sigma_Z)$ the MCMC works in the following manner.

i. The data is organized into blocks and subblocks to generate Z_{bst}, $\forall\, b\, \forall\, s$.

ii. Using principal components, initial values for $\{H_t\}, \{G_t\}$ and $\{F_t\}$ are estimated. Using these values, initial values for Λ, Ψ, Σ are produced.

iii. Conditional on $\Lambda, \Psi, \Sigma, \{G_{bt}\}$, and the data Z_{bst}, $\{H_{bst}\}$ is drawn $\forall\, b\, \forall\, s$.

iv. Conditional on $\Lambda, \Psi, \Sigma, \{H_{bt}\}$, and $\{F_t\}, \{G_{bt}\}$ is drawn $\forall\, b$.

v. Conditional on Λ, Ψ, Σ and $\{G_{bt}\}, \{F_t\}$, is drawn.

vi. Conditional on $\{F_t\}, \{G_{bt}\}$and $\{H_{bt}\}$, Λ, Ψ and Σ are drawn.

vii. Return to step iii

Objective 4: **Estimate the time-varying dimensions of globalization effect.**

Software Used: MATLAB 14 and OCTAVE 5.2.0

Analysis Technique used

Once the domestic and foreign factors are evaluated, they are estimated in the TVP-R model with GDP growth rate of the next period as the dependent variable to examine the time-varying nature of macroeconomic dynamics over three decades. The sources of time variation so obtained with TVP-R model include both the coefficients. The evaluated factor-induced domestic and foreign leading indicator series (obtained from DHFM) are interpreted using GDP growth rates of India, to understand the time-varying dynamics between them and the role of stochastic volatility. In TVP-R model, GDP growth rate of the next period is taken as the dependent variable. MCMC algorithm is used to calculate posterior estimates, based on 10,000 iterations out of which 1,000 are discarded as burn-in for both the methodologies. The results obtained from TVP-R model are compared with the results obtained from the TVP-VAR model.

Time-Varying Parameter Regression

The sources of time variation so obtained with TVP-R model include both the coefficients.

The regression model following Nakajima (2011) is:

$$y_t = x_t' \beta + z_t' \alpha_t + \varepsilon_t, \quad \varepsilon_t \sim \mathcal{N}(0, \sigma_t^2), \quad t = 1, \ldots . n, \tag{3.15}$$

Where the time-varying coefficient is given as follows:

$$\alpha_{t+1} = \alpha_t + \mu_t, \quad \mu_t \sim \mathcal{N}(0, \Sigma), \quad t = 0, .. n-1 \tag{3.16}$$

and the stochastic volatility is given by:

$$\sigma_t^2 = \gamma \exp(h_t) \tag{3.17}$$

$$h_{t+1} = \phi h_t + \eta_t , \quad \eta_t \sim N(0, \sigma_n^2), \; t = 0, \ldots . . n-1 \tag{3.18}$$

Where y_t represents the scalar of response. x_t and z_t represent the vector of covariates of dimension $(k \times 1)$ and $(p \times 1)$ *respectively.* β_t *is* a $(k \times 1)$ vector of constant coefficients and α_t is a $(p \times 1)$ vector of time-varying coefficients; and h_{0t} is the stochastic volatility. The model assumes $\alpha_t = 0, \; \mu_0 \sim \mathcal{N}(0, \Sigma) , \gamma > 0 \; and \; h_0 = 0.$

Equation (3.15) has two portions of covariates, one suggesting the constant coefficients β and the other suggesting the time-varying coefficients α. Since we have to observe the time-varying relationship of foreign and domestic factor loadings, the reduced form of the model is formulated as:

$$y_t = z_{1t} \alpha_{1t} + z_{2t} \alpha_{2t} + \varepsilon_t, \quad \varepsilon_t \sim \mathcal{N}(0, \sigma_t^2), \quad t = 1, \ldots . . n, \tag{3.19}$$

where z_1 represents foreign factors, and z_2 represents the domestic factors. α_{1t} and α_{2t} are the time-varying coefficients of the foreign factors and domestic factors respectively. The

disturbance in the regression model, denoted by ε_t follows the normal distribution with the time-varying variance σ_t^2. The Log – volatility, $h_t = \log \sigma_t^2 \,/\, \gamma$ follows AR (1) process. The TVP-R model forms the state-space model, which is estimated using the Bayesian approach using MCMC following Nakajima (2011).

Time-Varying Parameter -Vector Autoregressive Model

The sources of time variation so obtained with TVP-VAR model include both the coefficients and the variance of nature. Unlike the TVP-regression model, in this model, the parameters are assumed to follow a random walk process. The same specifications, as suggested by Nakajima (2011) is used. The reduced form model is:

$$y_t = X_t \beta + A_t^{-1} \Sigma_t e_t, \quad e_t \sim \mathcal{N}(0, I_n), \qquad t = s+1, \ldots \ldots T \tag{3.20}$$

y_t is a vector of economic variables (GDP growth rate in the currents study) of size $(n \times 1)$

$X_t = I_s \otimes (y'_{t-1} \ldots \ldots y'_{t-s})$ is the matrix of the time-varying coefficients,

A_t is a lower triangular matrix with elements $a_t = (a_{21,t}, a_{31,t}, a_{32,t} \ldots . a_{nm-1,t})'$, wherein the diagonal elements are equal to one. Σ_t is the diagonal matrix, and the natural Log for the diagonal elements of Σt are $\sigma_t = \left(\sigma_{11,t}, \ldots . \sigma_{mn,t}\right)'$. The dynamics of the parameters hence are:

$$\beta_{t+1} = \beta_t + \mu_t^{\beta}$$

$$\alpha_{t+1} = \alpha_t + \mu_t^{\alpha}$$

$$\sigma_{t+1} = \sigma_t + \mu_t^{\sigma}$$

The error term vector for each variable is:

$$\begin{pmatrix} u_t^{\beta} \\ u_t^{a} \\ u_t^{\sigma} \end{pmatrix} \sim N\left(0, \begin{pmatrix} v_{\beta} & 0 & 0 \\ 0 & v_a & 0 \\ 0 & 0 & v_{\sigma} \end{pmatrix}\right)$$

Where (v_{β}, v_a, v_{σ}) are diagonal matrices.

3.9 Conclusion

A research methodology is a systematic approach to finding an answer to the problem that exists in the industry/ sector. Any problem can be analyzed by setting up specific objectives. The main aim of the research study is to understand the dynamics of globalization in the Indian economy. To achieve these objectives, the concept of Research Onion highlights seven layers that are related to identifying the design of research, approach of research, data collection and data analysis. The chapter in detail discusses the methodology adopted for each objective to estimate the results.

Appendix to Chapter -3

Table 3.1 KoF Globalization Index restructured, Source: KoF Globalization Index, 2018

Globalization Index, de facto	**Original**	**Scaled**	**Globalization Index, de jure**	**Original**	**Scaled**
Total	**99.87**	**100**	**Total**	**99.87**	**100.00**
Economic Globalization, de facto	***33.30***	***6.89***	***Economic Globalization, de jure***	***33.30***	***34.53***
Trade Globalization	*16.65*		*Trade Globalization*	*16.65*	*17.26*
Trade in goods	6.81		Trade regulations	5.41	5.61
Trade in services	7.49		Trade taxes	5.74	5.96
Trade in services	2.35		Tariffs	5.49	5.70
Financial Globalization	*16.65*		*Financial Globalization*	*16.65*	*17.26*
Foreign direct investment	4.58		Investment restrictions	3.61	3.75
Portfolio investment	2.21		Capital account openness 1	6.51	6.75
International debt	4.53	6.33	Capital account openness 2	6.53	6.77
International reserves	0.40	0.56			
International income payments	4.93				
Social Globalization, de facto	***33.27***	***46.53***	***Social Globalization, de jure***	***33.27***	***30.94***
Interpersonal Globalization	*11.09*	*15.51*	*Interpersonal Globalization*	*11.09*	*11.50*
International voice traffic	2.54	3.55	Telephone subscriptions	4.24	4.39
Transfers	3.06	4.28	Freedom to visit	3.46	3.59
International tourism	3.12	4.36	International airports	3.39	3.52
Migration	2.37	3.32			
Informational Globalization	*11.09*	*15.51*	*Informational Globalization*	*11.09*	*11.50*
Patent applications	3.89	5.44	Television	2.79	2.90
International students	3.46	4.84	Internet user	3.54	3.67
High technology exports	3.74	5.23	Press freedom	1.46	1.52
			Internet bandwidth	3.29	3.41
Cultural Globalization	*11.09*	*15.51*	*Cultural Globalization*	*11.09*	*7.95*
Trade in cultural goods	2.51	3.51	Gender parity	3.45	3.58
Trademark applications	1.47	2.06	Expenditure on education	3.43	
Trade in personal services	2.84	3.97	Civil freedom	4.21	4.37
McDonald's restaurant	2.57	3.60			
IKEA stores	1.70	2.37			
Political Globalization, de facto	***33.30***	***46.58***	***Political Globalization, de jure***	***33.30***	***34.53***
Embassies	11.89	16.63	International organisations	12.32	12.78
UN peace keeping missions	9.09	12.72	International treaties	10.99	11.39

Table 3.2 List of countries used, Geographic region they belong to, the average speed of convergence (SC), the potential for export (ΔT) and estimation of convergence/divergence situation

Country	Region	SC	ΔT	Situation	Country	Region	SC	ΔT	Situation
Afghanistan	A	-11.6323239	-276923.8863	2	Korea, Rep.	A	59.42817765	2352768.486	1
Algeria	NA	-61.0793943	-252784.6075	2	Kuwait	A	-4.4563392	-2176684.013	2
Andorra	E	-91.3388192	45216.2925	0	Lao PDR	A	-28.2409467	-884536.8113	2
Angola	SSA	-85.2851247	-167114.0338	2	Lebanon	A	-78.8526476	213191.8913	0
Antigua and Barbuda	LATC	-96.1187471	279370.7138	0	Liberia	SSA	-47.8477205	-177403.2025	2
Argentina	LATC	-34.6919289	1600316.898	0	Libya	NA	-57.7838714	554372.7188	0
Australia	O	22.95746116	-243435.1713	0	Luxembourg	E	-66.6188378	1848881.683	0
Austria	E	21.93556176	259232.555	1	Macao	A	-0.57804937	189751.995	0
Bahamas	LATC	-91.5446347	-816321.0275	2	Madagascar	SSA	-82.3795377	92068.95875	0
Bahrain	A	18.59545681	1956.75875	1	Malawi	SSA	-63.3984745	-42995.11	2
Bangladesh	A	30.45889417	-1324909.051	0	Malaysia	A	-27.6707222	428426.5288	0
Barbados	LATC	-55.1467279	372814.0775	0	Maldives	SSA	27.78046789	-3421537.331	0
Belgium	E	63.32439748	-3469914.725	0	Mali	SSA	-2.7675476	133059.9538	0
Belize	LATC	-85.6490092	103053.42	0	Malta	E	-5.80134615	162632.665	0
Benin	SSA	-30.8450254	-174957.5063	2	Mauritius	SSA	-82.1482777	-164709.0225	2
Bermuda	NAM	-19.4693306	612726.8525	0	Mexico	LATC	-4.01079657	3080479.033	0
Bhutan	A	-64.7852034	-104844.12	2	Mongolia	A	-16.608357	1123666.074	0
Bolivia	LATC	-55.8104459	100771.9025	0	Montserrat	LATC	-79.0336248	431.0875	0
Brazil	LATC	-63.4710185	-728956.7663	2	Morocco	NA	-3.91282633	573541.1588	0
Brunei	A	-94.4026704	7225.8325	0	Mozambique	SSA	-37.8177698	-515248.5063	2
Bulgaria	E	-72.7199261	282962.5375	0	Myanmar	A	32.90860627	6089222.394	1
Burkina Faso	SSA	-69.2108668	-38761.02375	2	Nepal	A	-38.0516301	-2544897.264	2
Burundi	SSA	-42.8256675	7971.1025	0	Netherlands	E	31.56509513	-2952449.079	0
Cambodia	A	-85.7904171	123961.5813	0	New Caledonia	O	-81.6209654	193933.2338	0
Cameroon	SSA	-51.7749898	232829.1513	0	New Zealand	O	-49.6350802	6381988.889	0
Canada	LATC	-7.54853114	1637197.483	0	Nicaragua	LATC	-77.5835746	487882.8813	0
Cape Verde	SSA	-83.6160919	1886845.253	0	Niger	SSA	-60.1061216	-5091.6775	2
Central African Republic	SSA	-97.39181	100766.0888	0	Nigeria	SSA	17.74593441	-164562.6413	0
Chad	SSA	-8.28397764	31585.14375	0	Norway	E	-3.99206936	2301148.255	0
Chile	LATC	-35.4835516	286297.5725	0	Oman	A	8.300465407	192537.1438	1
China	A	-56.3751792	167439.4463	0	Pakistan	A	29.73015775	1862898.475	1
Colombia	LATC	-61.1435214	9110185.514	0	Panama	LATC	-21.6985922	172595.2963	0
Comoros	SSA	-78.2542862	700398.1175	0	Papua New Guinea	O	-62.4995306	175114.835	0
Congo, Dem. Rep.	SSA	-31.3586575	208517.685	0	Paraguay	LATC	4.595131048	250249.1338	1
Congo, Rep.	SSA	-92.1247311	6368.65125	0	Peru	LATC	-64.008559	334372.505	0
Costa Rica	LATC	-85.8812886	320007.845	0	Philippines	A	-10.5070653	976264.6113	0
Cote d'Ivoire	SSA	-80.2728137	178450.4275	0	Poland	LATC	57.4821089	1444535.161	1
Cuba	LATC	-63.3765863	692484.63	0	Portugal	E	61.14073495	1334523.739	1
Cyprus	A	-74.583912	944132.2513	0	Qatar	A	0.029999986	717431.3575	1
Denmark	E	-26.9741517	1458481.929	0	Romania	E	-34.199705	1625342.034	0

Djibouti	SSA	-39.6808772	-436650.14	2	Rwanda	SSA	-50.6588643	63978.9875	0
Dominica	LATC	-35.9108233	-224931.7225	2	Saudi Arabia	A	60.33609003	-1338399.118	0
Dominican Republic	LATC	15.95629762	379454.8925	1	Senegal	SSA	-75.2278566	175913.0625	0
Ecuador	LATC	-60.9588951	368839.6863	0	Seychelles	SSA	-65.247849	35604.8325	0
Egypt, Arab Rep.	NA	-65.5637124	1519561.185	0	Sierra Leone	SSA	-61.30707	16970.04125	0
El Salvador	LATC	-26.3674263	-1452953.391	2	Singapore	A	-6.83106381	-7169778.351	2
Ethiopia (includes Eritrea)	SSA	-63.2681372	308314.6	0	Solomon Islands	O	-97.5463421	66414.1825	0
Fiji	O	-60.8073251	-548972.6638	2	Somalia	SSA	-91.1149916	-182306.8075	2
Finland	E	-45.8226095	1354728.045	0	South Africa	SSA	-51.1703411	-1890677.045	2
France	E	-16.4399714	2683062.788	0	Spain	E	9.094889513	1926123.529	1
Gabon	SSA	-37.4824951	-3853678.613	2	Sri Lanka	A	-18.7591442	-3710750.519	2
Gambia	SSA	-97.6417289	7828.87875	0	St. Kitts and Nevis	LATC	-92.8136889	169726.82	0
Germany	E	-161.572022	4478599.854	0	St. Lucia	LATC	-64.7265259	68625.48625	0
Ghana	SSA	1.350729337	-6045672.661	0	St. Vincent &Grenadines	LATC	-99.7203883	36971.27	0
Greece	E	-24.786837	650351.9038	0	Sudan	NA	-21.4456781	217655.1275	0
Grenada	LATC	-76.7741203	-273622.1175	2	Suriname	LATC	-52.5516921	145559.4563	0
Guatemala	LATC	-90.6683708	409105.4238	0	Sweden	E	146.4661808	4368621.353	1
Guinea	SSA	-63.6939348	43742.3775	0	Switzerland	E	232.3103048	1880268.491	1
Guinea-Bissau	SSA	-70.4522812	-48525.7525	2	Syrian Arab Republic	A	0.934175707	-83833.245	0
Guyana	LATC	-78.279648	73477.80125	0	Tanzania	SSA	11297.98638	-1003362.44	0
Haiti	LATC	-18.1717433	91979.09875	0	Thailand	A	27.25564792	-1373007.575	0
Honduras	LATC	-67.4146026	208857.6838	0	Togo	SSA	-63.1873922	-283134.615	2
Hong Kong	A	-15.022422	1907608.024	0	Tonga	O	-79.2212063	37604.00375	0
Hungary	E	35.36712995	-9604180.004	0	Trinidad and Tobago	LATC	-68.4676362	298198.765	0
Iceland	E	16.4064238	-22054.06375	0	Tunisia	NA	-22.7940475	326624.245	0
Indonesia	A	-49.9296091	2788201.171	0	Turkey	A	-32.9789129	2390146.094	0
Iran	A	30.31770606	2406349.643	1	Uganda	SSA	-5.11548767	-248097.6738	2
Iraq	A	35.10985502	2089967.368	1	UAE	A	17.1403311	-25628001.07	0
Ireland	E	-99.9999994	1026704.04	0	UK	E	161.5499112	4293379.013	1
Israel	A	12.81101499	1203029.491	1	US	NAM	67.85793755	-12269092.63	0
Italy	E	-3.06157653	2272635.326	0	Uruguay	LATC	-49.8068237	1256542.2	0
Jamaica	LATC	0.937161752	-3726322.136	0	Vanuatu	O	-86.1156588	50843.08	0
Japan	A	-46.2211619	4277442.415	0	Venezuela	LATC	-44.6840355	695418.235	0
Jordan	A	748.6359025	-3735684.26	0	Vietnam	A	-39.9379517	-2429774.063	2
Kenya	SSA	-8.75644751	-494277.5875	2	Yemen	A	-21.9713061	-528733.71	2
Kiribati	O	-63.9963562	-2707862.691	2	Zambia	SSA	71.58208858	-62976.52375	0
Korea, Dem. Rep.	A	-83.6958848	307546.3813	0	Zimbabwe	SSA	-46.3422149	-71116.0775	2
Where 0 suggests convergence; 1 suggests restrictive potential; 2 suggests over trade situation.									

CHAPTER 4 - NEXUS OF GLOBALIZATION, INTERNATIONAL TRADE AND ECONOMIC GROWTH

4.1 Introduction

Employing the annual time series data from 1980-2016, the chapter aims to gauge the empirical relationship between globalization, international trade and economic growth of the Indian economy. To ensure stationarity of the data, ADF test along with PP and KPSS test are undertaken. Johansen's co-integration test suggests evidence of co-integration in the data. Hence, VECM and DOLS estimations are used to understand the adjustment of variables. The results so obtained are used to investigate short-run and long-run causality using the Wald test and Toda- Yamamoto Granger Causality test, respectively. To assess the response path, variance decomposition and impulse response functions are created.

4.2 Unit Root and Stationarity Test

The confirmatory data analysis in Table. Suggests that the variables are non-stationary at the level. The variables are stationary and are free from the unit root after the variables first differencing, and, hence, are integrated to order one.

Table 4.1 Confirmatory Data Analysis

	Level			**First Dif.**		
Variable	**ADF**	**PP**	**KPSS**	**ADF**	**PP**	**KPSS**
LRGDP	-0.9427	-0.7095	0.2029 ***	-5.3432 ***	-6.1602 ***	0.1487 ***
LTR	-2.0677	-2.1318	0.1802 ***	-3.8106 **	-3.7941 **	0.1165***
GI	-1.4675	-1.7647	0.1198 ***	-4.1993 **	-4.1878 **	0.2165 ***

4.3 Johansen Cointegration test

Johansen co-integration test confirms the presence of one cointegrating equation as suggested by the likelihood ratios. Since the λ_{Trace} Statistics value and the λ_{Max} Statistics value is higher

than the critical value, the results in table 4.2 suggest a long-run co-integration between the variables

Table 4.2 Johansen Cointegration

Vector	Test Statistics		Critical Value 5%		Probability Value	
	λ_{Trace}	λ_{Max}	λ_{Trace}	λ_{Max}	λ_{Trace}	λ_{Max}
0	45.04459	32.75286	24.27596	17.79730	0.0000	0.0002
1	*12.29173*	10.05878	12.32090	11.22480	0.0506	0.0796
2	2.232951	2.232951	4.129906	4.129906	0.1594	0.1594

4.4 Vector Error Correction Model

The three equations used for the analysis in the VECM are as follows

$$\Delta LGDP_t = \alpha_{10} + \sum_{s=1}^{2} \alpha_{11}(s)\Delta LGDP_{t-s} + \sum_{s=1}^{2} \alpha_{12}\Delta LTR_{t-s} + \sum_{s=1}^{2} \alpha_{13}\Delta GI_{t-s} + \gamma_1 EC_{t-1} + \varepsilon_{1t} \quad (4.1)$$

$$\Delta LTR_t = \alpha_{20} + \sum_{s=1}^{2} \alpha_{21}(s)\Delta LGDP_{t-s} + \sum_{s=1}^{2} \alpha_{22}\Delta LTR_{t-s} + \sum_{s=1}^{2} \alpha_{23}\Delta GI_{t-s} + \gamma_2 EC_{t-1} + \varepsilon_{2t} \quad (4.2)$$

$$\Delta GI_t = \alpha_{30} + \sum_{s=1}^{2} \alpha_{31}(s)\Delta LGDP_{t-s} + \sum_{s=1}^{2} \alpha_{32}\Delta LTR_{t-s} + \sum_{s=1}^{2} \alpha_{33}\Delta GI_{t-s} + \gamma_3 EC_{t-1} + \varepsilon_{3t} \quad (4.3)$$

The system of the equation so obtained based on ordering by variables with Real GDP as the dependent variable is as follows:

$$\begin{aligned} D(LGDP,2) = \alpha_1 \big(D\big(LGDP(-1)\big) - 0.117060017862 * D\big(LTR(-1)\big) + \\ 0.00237899334248 * D\big(GI(-1)\big) - 0.0022605960753 * D1(-1) - \\ 0212320290835\big) + \alpha_2 D(LGDP(-1),2) + \alpha_3 D(LGDP(-2),2) + \\ \alpha_4 D(LTR(-1),2) + \alpha_5 D(LTR(-2),2) + \alpha_6 D(GI(-1),2) + \\ \alpha_7 D(GI(-2),2) + \alpha_8 D(D1(-1)) + \alpha_9 D(D1(-2)) + \alpha_{10} \end{aligned} \quad (4.4)$$

were,

GDP – Gross Domestic Product;

TR- Total trade;

GI- KoF Globalization Index;

α1- coefficient of the cointegrating equation;

α2 to α9 - coefficients of the variables;

α10 - intercept

Table 4.3 displays the VECM results. The error correction term is significant and negative (-2.605425), rejecting the hypothesis of no long-run causality, which is also confirmed using Toda-Yamamoto granger causality. The coefficients for the lagged values of the predictors are significant. Only the second lag value of globalization index is not significant, indicating the myopic nature of the model. The dummy is insignificant in the first lag but becomes significant in the second lagged value. There is a long-run relationship between globalization, trade and economic growth as indicated by the model which have also been indicated in Tsaurai (2017) and Hye & Lau (2015).

Table 4.3 Vector Error Correction Model

Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C (1)	-2.605425	0.478100	-5.449545	0.0000
C (2)	1.428821	0.368434	3.878093	0.0008
C (3)	0.640878	0.236530	2.709499	0.0128
C (4)	-0.218193	0.051929	-4.201761	0.0004
C (5)	-0.090225	0.032098	-2.810927	0.0102
C (6)	0.002575	0.001441	1.786898	0.0877
C (7)	0.002044	0.001426	1.433667	0.1657
C (8)	-0.008498	0.009786	-0.868432	0.3945
C (9)	-0.018432	0.010688	-1.724555	0.0986
C (10)	0.000259	0.001438	0.179980	0.8588
R-squared	0.675496	Mean dependent var		7.35E-05
Adjusted R-squared	0.542745	S.D. dependent var		0.011397
S.E. of regression	0.007707	Durbin-Watson stat		2.143548
Sum squared resid	0.001307			

4.5 DOLS Estimation

Table 4.4 DOLS Estimation

Variables	Coefficient	Std. Error	t-Statistic	Prob.
D(LTR)	0.176364	0.037344	4.722656	0.0001
D(GI)	-0.005939	0.002181	-2.723024	0.0135
D1	0.003063	0.003072	0.997041	0.3313
C	0.021106	0.002270	9.296305	0.0000
R-squared	0.688248	Mean dependent var	0.026993	
Adjusted R-squared	0.491353	S.D. dependent var	0.009049	
S.E. of regression	0.006453	Sum squared resid	0.000791	
Long-run Variance	2.89E-05			

DOLS estimations are used to estimate the single cointegrating vector. The number of leads and lags are selected on the basis of AIC. Estimation results show that trade and globalization are statistically significant, whereas the breakpoint is statistically insignificant in explaining the growth of the economy. The results further confirm that trade positively affects growth in the Long run (Table 4.4). However, a cynical yet significant long-run relationship between growth and globalization is indicated. Also, the residuals are free from the unit root and are stationary at the level at 1% significance level (Table 4.5), hence suggesting DOLS estimates are not spurious.

Table 4.5 Unit Root and Stationarity Test on Residuals from DOLS at level

Variable	ADF	PP	KPSS
DOLS Residuals	-5.748194 ***	-5.747653 ***	0.100392***

4.6 Wald Test

The wald test results shown in Table 4.6 validates short-run causality between trade and growth. However, similar could not be established for globalization and growth in the short-run.

Table 4.6 Wald Test

Null Hypothesis	Test Statistic	Value	df	Prob.
C (2) =C (3) =0	F-statistic	7.545402	(2, 22)	0.0032
	Chi-square	15.09080	2	0.0005
C (4) =C (5) =0	F-statistic	8.827692	(2, 22)	0.0015
	Chi-square	17.65538	2	0.0001
C (6) =C (7) =0	F-statistic	1.875921	(2, 22)	0.1769
	Chi-square	3.751842	2	0.1532

4.7 Yamamoto Granger Causality

The results of long-run causality are no different from short-run causality. There is clear evidence of bi-directional causality between international and economic growth. No long-run causality between globalization and economic growth is indicated (Table 4.7).

Table 4.7 Toda Yamamoto Granger Causality

Dependent Variable	Excluded	Chi-sq.	df	Prob.
LGDP	LTR	13.76943	4	0.0081
	GI	5.737319	4	0.2196
	All	19.09961	8	0.0143
LTR	LGDP	17.76455	4	0.0014
	GI	4.810946	4	0.3073
	All	20.06220	8	0.0101
GI	LGDP	1.612888	4	0.8065
	LTR	2.278595	4	0.6847
	All	5.893839	8	0.6591

4.8 Variance Decomposition

Following the Cholesky ordering, economic growth followed by trade and globalization, the results of Variance Decomposition Analysis (Table 4.8) suggest a positive effect of international trade and globalization on growth.

In period two (short-run), an impulse or shock to GDP accounts for 68.24 per cent variation in the fluctuation in GDP, suggesting strong endogeneity. An innovation to trade and

globalization in period 2 causes 16.02 per cent and 15.53 per cent fluctuation in GDP, respectively, indicating a reasonable exogeneity. While the variations of GDP taper off over time, trade comes to explain more of the change in GDP in subsequent periods. Similarly, globalization has been one of the significant constituents of GDP growth, explaining 27% fluctuation in GDP in the tenth period. While for globalization the impact of GDP tapers off, it is still considerable even in the 10th period accounting for over two-thirds of fluctuations. The real picture emerges in explaining the variations in trade, where both GDP and globalization have only a negligible effect on trade activity in subsequent periods. The results can be validated from the literature explaining the positive relationship between trade and economic growth.

Table 4.8 Variance Decomposition

	Period	S.E.	D(LGDP)	D(LTR)	D(GI)
D(LGDP)	1	0.007707	100.0000	0.000000	0.000000
	2	0.009385	68.24834	16.02413	15.52785
	3	0.011177	50.97642	32.41477	15.78670
	4	0.013091	40.72057	35.78777	18.75996
	5	0.013763	36.99419	36.34072	20.39183
	6	0.014513	33.48587	36.68993	23.44798
	7	0.014948	31.60780	38.27509	23.94141
	8	0.015509	29.36877	39.25847	25.00721
	9	0.016085	27.30769	40.64834	25.88935
	10	0.016736	25.36288	41.65780	26.85809

4.9 Impulse Response Functions

Corresponding to the above variance decomposition effect, the paper in Figure 4.1 estimates Impulse Response Functions (IRF) to identify and understand the response of a variable due to an impulse in another. While the response of trade to GDP is on expected lines, the change in one standard deviation for GDP brings about an adverse reaction for globalization. More

critical, response functions indicate that the effect does not taper off for each of the indicators as the transmission carries off throughout the ten periods. Although the impact of trade on globalization is negative, it cannot carry many connotations. On the other hand, the surprising result is the effect of globalization on growth, which is mostly negative and mellowed, whereas the impact on trade is much more subdued.

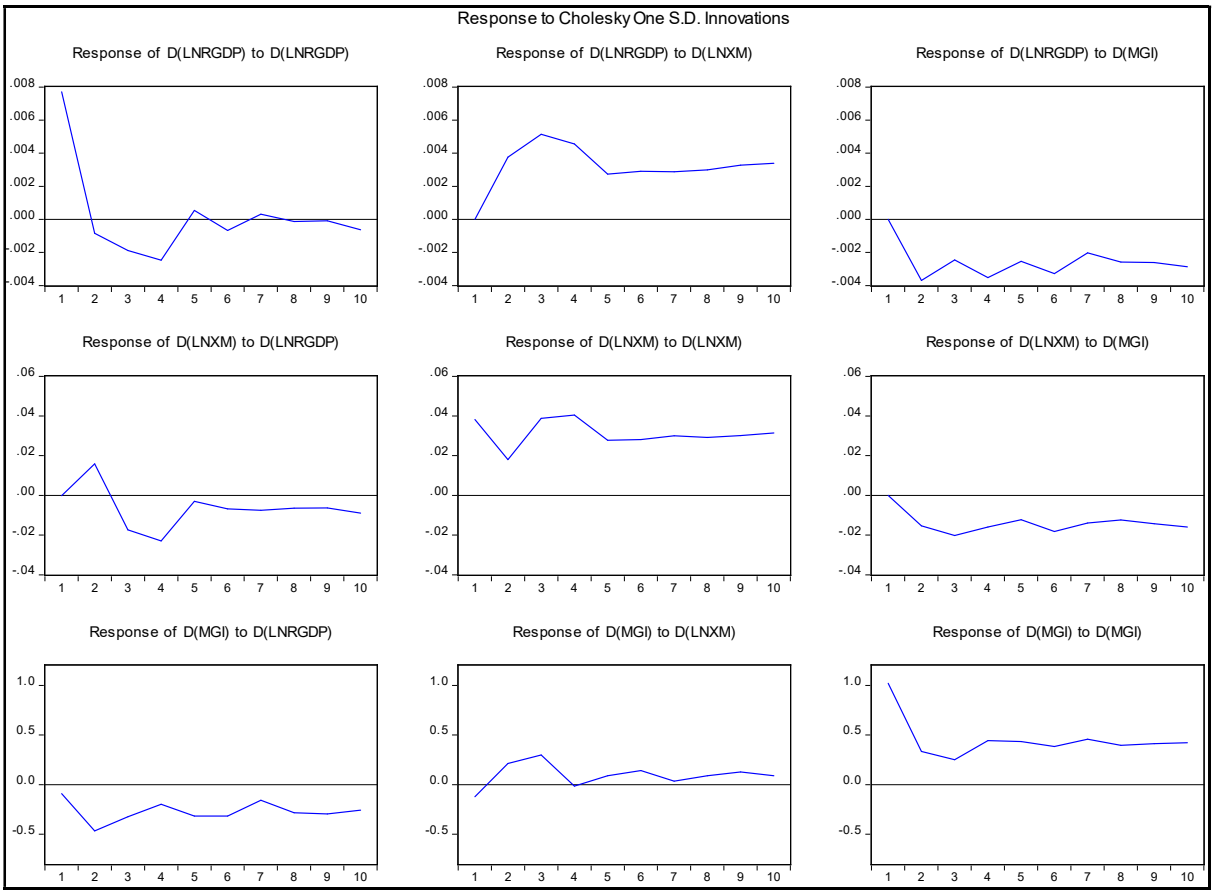

Figure 4.1 Impulse response functions growth, trade and globalization

To determine the robustness of the model, diagnostic tests are implemented in Table 4.9. Autocorrelation, Heteroscedasticity in the model is examined along with normality. The results conclude the robustness as the VECM residual qualifies all diagnostic tests.

Table 4.9 Diagnostic Tests of the VEC Model Residual

	Df	Test Statistic	P-Value
Serial Correlation LM Test	16	13.52766	0.6339
White Heteroskedasticity Test	2	0.269538	0.8739
Normality Test	160	147.9234	0.7439

4.10 Conclusion

The chapter tries to analyze whether there exists a short-run and long-run relationship between globalization, economic growth and international trade. Globalization has a negative effect, and trade bears a positive effect on economic growth. However, contrary to the perception of New Growth Theory, increasing trade and globalization do not have an impact on the long-run economic growth. The novelty lies in using an augmented version of KoF Index is used to avoid the problem of collinearity and more robust approach. Table 4.10 suggests the descriptive statistics of the data.

Table 4.10 Descriptive Statistics

	LGDP	LTR	GI
Mean	5.857948	5.127594	42.58279
Median	5.838299	5.017261	42.34009
Maximum	6.360416	6.035963	55.12911
Minimum	5.419582	4.450285	31.50459
Std. Dev.	0.282529	0.555593	9.194859
Skewness	0.186940	0.420318	0.099107
Kurtosis	1.845663	1.743886	1.358677
Jarque-Bera	2.208418	3.426736	4.099844
Probability	0.331473	0.180258	0.128745
Sum	210.8861	184.5934	1532.980
Sum Sq. Dev.	2.793796	10.80392	2959.090

CHAPTER- 5 - IMPACT OF GLOBALIZATION ON EXPORTS

5.1 Introduction

Globalization has played a significant role in India's growth. Thirty years of globalization have bolstered India's exports. While globalization has been a contributor to India's growth, experiments with globalization have been regional, not global. With a purpose to study the benefits and direction of globalization, the chapter examines the trade opportunities for India. For this, we examine the impact of globalization on exports using the gravity model by observing trading patterns with 154 export. The sample period of the study covers the post-reform period from 1991 to 2017, including the Asian financial crisis and the GFC, which had a significant influence on the exports from India. The KoF Index of globalization, exchange rates, Linder effect, besides, dummies capturing the impact of RTAs, landlocked countries, common language, years of crisis and contiguity form the basis of this analysis. Secondly, the chapter presents an analysis of narrow and broad globalization and presents evidence for regionalization. The gravity model, using Poisson Pseudo-Maximum Likelihood (PPML) estimations technique, explains approximately 69% variations in exports empirically supporting Linder Hypothesis. Using the speed of convergence and divergence measure, we establish India's narrow globalization. The analysis of speed and rate of convergence points to a trade potential with 102 trading partners of India. The chapter shows evidence of regionalization, defining narrow and broad globalization.

5.2 Results

Table 5.1 reflects the results of the estimation. Table 5.2 suggests the descriptive statistics of the variables in the study. For clarity, results are presented with the details of the models

followed by an analysis on convergence and divergence of trade. Figure 5.1 pertains to India's export situation based on regions to establish a trend of broad and narrow globalization, along with details of export potential with various partners.

The simplest estimated PPML model with regular FE (4) explains 69% variation of the exports about its mean, beyond which can be explained by the factors outside the scope of the study like FDI, financial flows, cultural similarity to name a few. Globalization in India and the trading partner has a significant positive impact on the exports of the Indian economy. However, globalization in India has a stronger influence on exports as compared to globalization abroad. A unit per cent increase in globalization in India would lead to a 1.267% increase in the exports, and an increase in globalization in the trading partner would lead to a 1.00482% increase in the exports. The elasticity of exports to economic size and the market size is positive, and the coefficients are statistically significant and tend to have a positive influence. However, the empirical results suggest that an increase in the population of the trading partner has a negative impact on the exports from India. Literature suggests that this can happen when the increase in population leads to an increase in the production in the home country to serve the people. The cost of transport has a significant yet negative impact on exports. A unit per cent increase in the exchange rate is estimated to have an insignificant impact on exports. The results suggests that India exports 71 % to the countries that have signed an RTA with India. Contiguity and sharing at least one common language with the trading partner is found to aid trade, and higher exports are estimated with countries that are closer and share a common language. As suggested by the results, India exports lesser to landlocked countries as compared to other connected countries. Also, it is implied that exports

Table 5.1 Result of Gravity Estimation

Variables	OLS (1)	OLS FE (2)	PPML (3)	PPML (4)	PPML (5)	PPML (6)	GPML (7)	3-year (8)	3-year (9)	4-year (10)	4-year (11)	5-year (12)	5-year (13)
$Globalization_{it}$	0.265***	0.264***	0.267***	0.267***	0	0.235***	0.210**	0	0	0	0	0	0
	(0.0135)	(0.0135)	(0.0334)	(0.0334)	(.)	(0.0184)	(0.0086)	(.)	(.)	(.)	(.)	(.)	(.)
$Globalization_{jt}$	0.0286***	0.0268***	0.00482*	0.00482*	0.0391***	0.0301**	0.0236**	0.0307***	0.00388**	0.0261**	0.00309**	0.0297**	0.00416**
	(0.00446)	(0.00478)	(0.00431)	(0.00431)	(0.00505)	(0.00937)	(0.0021)	(0.00872)	0.00733)	(0.00919)	(0.00856)	(0.00913)	(0.00863)
Log ($Population_{it}$)	3.777***	3.767***	5.706***	5.706***	0	6.301***	4.0901**	0	0	0	0	0	0
	(0.351)	(0.350)	(0.826)	(0.826)	(.)	(0.429)	(0.494)	(.)	(.)	(.)	(.)	(.)	(.)
Log ($Population_{it}$)	0.547***	0.571***	0.808***	0.808***	0.635***	0.463***	0.745***	0.470***	-0.350**	0.391**	-0.361*	0.393***	-0.380*
	(0.0533)	(0.0635)	(0.0614)	(0.0614)	(0.100)	(0.131)	(0.0346)	(0.139)	(0.128)	(0.133)	(0.150)	(0.117)	(0.170)
Log ($RGDP_{it}$)	-30.85***	-30.78***	0.680***	0.680***	0	0.733***	0.75**	0	0	0	0	0	0
	(2.347)	(2.341)	(.0679)	(0.0679)	(.)	(3.147)	(2.533)	(.)	(.)	(.)	(.)	(.)	(.)
Log ($RGDP_{jt}$)	0.423***	0.482***	0.325***	0.325***	0.521***	0.262*	0.453**	0.753***	0.838***	0.784***	0.845***	0.827***	0.875***
	(0.0572)	(0.0727)	(0.0710)	(0.0710)	(0.0837)	(0.117)	(0.0308)	(0.162)	(0.107)	(0.159)	(0.128)	(0.156)	(0.139)
Log (Transportation cost)	-0.241***	-0.243***	-0.201***	-0.201***	-0.169***	0.0225	-0.0353**	-0.182***	-0.303***	-0.0959*	-0.294***	-0.132**	-0.296***
	(0.0203)	(0.0204)	(0.0380)	(0.0380)	(0.0357)	(0.0515)	(0.0169)	(0.0534)	(0.0485)	(0.0447)	(0.0538)	(0.0475)	(0.0414)
Log (Exchange Rate)	0.0768***	0.0807***	0.00641	0.00641	0.0679***	0.0188	0.0108	0.153*	0.00196	0.127*	0.00387	0.0868	0.00518
	(0.0154)	(0.0166)	(0.0107)	(0.0107)	(0.0181)	(0.0324)	(0.0861)	(0.0596)	(0.0148)	(0.0575)	(0.0180)	(0.0504)	(0.0178)
Linder	0.170*	0.178**	-0.270**	-0.270**	0.0542	0.165	-0.464**	0.0273	-0.375**	0.00285	-0.369**	-0.0711	-0.508*
	(0.0670)	(0.0676)	(0.122)	(0.122)	(0.0578)	(0.104)	0.1314)	(0.0854)	(0.158)	(0.117)	(0.197)	(0.140)	(0.215)
RTA	0.0163	-0.0178	0.665***	0.665***	0.0261	0.0205	0.0149**	-0.0141	0.694***	0.0332	0.685***	0.0594	0.677**
	(0.0656)	(0.0676)	(0.0877)	(0.0877)	(0.0306)	(0.0495)	(0.0189)	(0.0504)	(0.156)	(0.0554)	(0.180)	(0.0626)	(0.210)
Contiguity	1.319*	0	0.632***	0.632***	0	0	0	0	0.661***	0	0.676**	0	0.650**
	(0.541)	(.)	(0.108)	(0.108)	(.)	(.)	(.)	(.)	(0.190)	(.)	(0.208)	(.)	(0.221)
Common language	0.261***	0.277***	0.140	0.140	-0.0560	0.214	0.363	0.108	0.0827	0.123	0.0862	0.0651	0.0873
	(0.0603)	(0.0617)	(0.0729)	(0.0729)	(0.0699)	(0.140)	(0.0233)	(0.0993)	(0.120)	(0.0918)	(0.137)	(0.118)	(0.156)
Landlocked nations	0.00369	0	-0.870***	-0.870***	0	0	0.106**	0	-0.882***	0	-0.905***	0	-0.920**
	(0.292)	(.)	(0.135)	(0.135)	(.)	(.)	(0.261)	(.)	(0.240)	(.)	(0.255)	(.)	(0.291)
Crisis	-0.0473	-0.0464	-0.296**	-0.296**	0	-0.234***	-0.288**	0	0	0	0	0	0
	(0.0381)	(0.0380)	(0.0924)	(0.0924)	(.)	(0.0365)	(0.0152)	(.)	(.)	(.)	(.)	(.)	(.)
Constant	363.2***	361.9***	451.0***	451.0***	-1.416	451.5***	356**	-1.691	7.027***	-1.080	6.932***	-2.148	6.710***
	(27.43)	(27.36)	(66.58)	(66.58)	(0.826)	(37.27)	(28.27)	(1.315)	(0.532)	(1.314)	(0.614)	(1.462)	(0.634)
R-squared	0.62	0.61	0.56	0.69	0.98	0.95	0.210**	0.98	0.74	0.98	0.74	0.98	0.75
Ramsey RESET test	0.00	0.00	0.05	0.06	0.02	0.17	0.06	0.06	0.06	0.33	0.08	0.32	0.06
λ=1	0.00	0.00	0.00	0.00	0.40	0.78	0.00	0.49	0.71	0.47	0.64	0.48	0.66
λ=2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Type of Fixed Effect	None	Regular FE	None	Regular FE	Importer, Time	Time	Regular FE	Importer, Time	Time	Importer, Time	Time	Importer, Time	Time

1 Note: *p < 0.1; **p < 0.05; ***p < 0.10. Standard errors in parentheses.

from India are more if there is at least one common shared language with the trading partner. An essential highlight of the results is for the crisis years. The results validate that exports are lesser in the crisis-hit years, suggesting crisis at the global level affect the exports from India negatively.

With the levelling of playing field globally, trade cost and distance are no more a constraint to trade. The coefficient of the Linder term is negative (−0.270) and significant highlighting that India trades more with countries at a similar level of development. As an initiative to strengthen international trade relations regionally, the 'Look East' and 'Act East' policies were introduced in 1991 and 2014, respectively. The results validate the success of these policies.

5.3 Robustness Check of PPML estimator

The estimated signs of the coefficients match the expectation (Table 5.3) and also are consistent with the meta-analysis results of Head and Mayer (2014). The coefficients lie in the range of one standard deviation for most of the models. For the Indian economy, market size, that is, the population bears a positive sign indicating a direct relationship between population and the exports. The Ramsey RESET test is used to check the robustness of the model (0.0585), and it confirms the fit of the model at the 5 % level of significance. However, the coefficients of these variables are not estimable when we introduce time-varying FEs into the model. The coefficients of OLS (1) and OLS with FE (2) are too varied as compared to other models. These two models do not take into account the zeros and heteroscedasticity. PPML (3) and (4), the model is estimated with the dependent variable in level to account for zeros in the trade data and heteroscedasticity. Head and Mayer (2014) suggest that if PPML and GPML offer similar coefficients, though different from OLS, it is an indicator of heteroscedasticity and unreliable estimates. For the robustness check of the estimates, following Baier et al. (2018), the efficiency of the estimators is compared with other

approaches. RESET test rejects the specifications of (1), (2) and, and lend support to PPML (3), (4), (5), (6), GPML (7), and the PPML models with interval estimation (8)-(13). Also, the Park (MaMu) test for efficiency by Manning and Mullahy (2001) is employed, model (4) supports the hypothesis of $\lambda = 1$. We further examine the robustness of the results using time intervals. Table 1 reflects the estimations of PPML using 3, 4- and 5-year interval estimations (model 8-13). All the models use FEs pass the RESET test. The coefficients obtained are similar sized and are robust to the intervals. The PPML estimations are the most robust specification to heteroscedasticity, trade flows and reduce the endogeneity problem. If the problem of endogeneity is tried to be eliminated using pair FEs, model (8), (10) and (12), it is observed that RTAs become insignificant. Dadakas et al. (2020) support the notion that when the model includes all the Country pair FEs, they absorb all the variables that very bilaterally. They suggest that RTAs are usually signed between the countries that have higher trade between them, and this in itself is a critical factor in the effectiveness of RTAs.

5.4 Export potential, Speed of Convergence and Time of convergence

The PPML estimations are then used to calculate the export potential; hence, ΔT and SC are calculated (Table 5.4). Out of 154 countries, it is found that India has convergence with 102 countries out of which 22 are from Latin America and the Caribbean, 18 are from Asia, 16 from Sub-Saharan Africa, ten from Europe, six from Oceania, two from North Africa, and only one North American country (Figure 5.1). Similar results are also estimated by Batra (2006) and Wani and Dhami (2016) for a smaller sample via a different approach. The results suggest a reorientation of exports towards east from the west. The trade convergence is further validated by using a panel correction model which suggests a significant convergence to the estimated equilibrium relationship.

Actual trade is regressed on the difference between actual exports and potential exports of the previous period using the equation:

$$Exports_{ijt} = \alpha + \beta\,(Exports_{ij,\,t-1} - Potential\ Exports_{ij,\,t-1}) \qquad (5.1)$$

Figure 5.1 Export Convergence/ Divergence Dynamics

The estimated coefficient is negative and significant (-0.038871***). The estimations also suggest divergence with 52 countries. However, in the case of divergence, it is further diagnosed whether the countries over trade with each other or have low potential. Eighteen countries have the restrictive export potential for the Indian economy, because of the political and economic environment of these countries, which include Iraq, Israel and Pakistan. With 34 trading partners, over exports have been estimated. As also indicated by the Linder hypothesis India has been trading more with the developing countries. India has been exporting more to the developing nations of Sub-Saharan Africa and Asia and a few countries of Europe and Latin America.

The ratio of ΔT/SC suggests the time of convergence. The smaller the time of convergence, the higher are the possibilities of strengthening exports with that country. In the case of divergence, a positive ΔT indicates the restrictive potential and a negative ΔT suggests overtrade (Binh et al. 2011). They are the trading partners who have high SC and small ΔT.

A more substantial speed of convergence and a smaller difference in the trade leads to a move towards potential export value quickly. Guatemala has the shortest time of convergence, and Venezuela has the highest time for convergence. Table 5.5 suggests the top 25 countries with which time of convergence is lowest. These tendencies can be strongly correlated with the structure of exports of India and the changing import demand patterns of these countries. With India now specializing in peripheral activities, exporting technology-intensive high valued goods, it shall be in the benefit of the Indian economy to export more to the Latin American countries. Of the 34 countries that India had overtrade with, 17 belonged to Asia and Sub-Saharan Africa. India also showed overtrade with few of its Asian trading partners. Of the 36 countries in Latin America and the Caribbean, India had overtraded with five. Of these, three were countries that we share a cultural heritage with and have a sizeable Indian ex-pat population. The results, thus, suggest that India has further export potential with the majority of sub-Saharan and Asian countries, indicating narrow globalization as the integration with the rest of the world remains limited. Global integration is yet to be tapped to achieve broad globalization. Despite Tripathi and Leitão (2013), Bhattacharyya and Banerjee (2006), Batra (2006) suggesting that trade is inversely related to the geographical proximity of the trading partners, integrating with the farther located nations shall reap benefits to the Indian economy.

5.5 Chapter Conclusion

The chapter analyzes the impact of globalization on the merchandise exports from India from 1991-2017 using gravity model estimated using PPML estimation method. The chapter suggests the countries with which India has export convergence, over trade and restrictive trade. The key highlight of the chapter is that India trades more with the partners that are located closer as compared to ones that are located far off, suggesting narrow globalization for Indian economy.

Table 5.2 Descriptive Statistics

Variable	Mean	Std. Dev.	Obs.	Variable	Mean	Std. Dev.	Obs.
$Exports_{ijt}$	749267.6	2689525	154	Linder	-0.33328	.4022755	154
$Globalization_{it}$	51.75395	9.72851	154	Cost	2.952111	62.35812	154
$Globalization_{jt}$	55.62082	16.63255	154	Dummy for RTA	0.435546	.4958879	154
$Population_{it}$	1121442	136955	154	Dummy for Contiguity	0.038961	.1935254	154
$Population_{jt}$	32308.56	111778	154	Dummy for Language	0.356421	.4789993	154
GDP_{it}	342388.2	1311406	154	Dummy for Landlocked	0.155844	.3627512	154
GDP_{jt}	1220847	632733.7	154	Dummy for Crisis	0.259259	.4382808	154
Exchange Rate	13.08838	49.40056	154				

Table 5.3 Codes for Regions

Code	Region	Code	Region	Code	Region
SSA	Sub-Saharan Africa	NA	Northern Africa	O	Oceania
A	Asia	E	Europe	NAM	North America
LATC	Latin American and Caribbean				

Table 5.4 Top 25 countries with least time of convergence

Country	ΔT	Region	Country	ΔT	Region
Guatemala	5.454482	LATC	Bolivia	2970.092	LATC
Comoros	80.17964	SSA	Denmark	3098.107	E
Italy	276.804	E	Burundi	3726.165	SSA
Libya	590.4046	NA	Bermuda	3812.799	NAM
Cote d'Ivoire	686.7589	SSA	Barbados	4496.942	LATC
Cuba	938.6578	LATC	Costa Rica	4512.107	LATC
Antigua and Barbuda	1203.206	LATC	Chile	4873.142	LATC
Japan	1828.683	A	Cyprus	5061.655	A
Cambodia	2223.049	A	Central African Republic	6050.629	SSA
Ireland	2338.403	E	Haiti	6288.482	LATC
Ethiopia (includes Eritrea)	2703.674	SSA	Bulgaria	6649.446	E
Korea, Dem. Rep.	2769.834	A	Hong Kong, China	7954.216	A

CHAPTER 6- TRACING THE EVIDENCES OF SLOWBALIZATION

6.1 Introduction

The chapter aims to capture twin fold information. First, the results of the Dynamic Hierarchical Factor Model (DHFM) are discussed with the interpretation of the factors. To achieve this, an analysis of the correlation between the common factor and estimated block and sub-block factors and a novel graphical representation of the same is done. Further, the study reflects the decomposition of the variance of each block and sub-block into shares identified with factors and the idiosyncratic component. The second part suggests that the effect of globalization can be seen with changes in the values of the coefficient of the foreign block. For this, we estimate the time-varying dynamics of the estimated block-level factors from DHFM model and the GDP growth of the Indian economy are estimated.

6.2 Specification

The first level of the classification consists of two blocks – domestic and foreign blocks. The foreign block is further subdivided into six sub-blocks, which is the regional classification of the countries represented in the table 6.1.

Table 6.1 Block and subblock structure of the data

Block	Sub-block	No. of series
Domestic factors	No sub-block	11
Foreign factors	East Asia and Pacific	28
	Europe and Central Asia	28
	Sub-Sahara Africa	3
	Middle East	2
	North America	10
	South Asia	3

6.3 Dynamic Hierarchical Factor Model

A total of 1,00,000 iterations were run, dropping out initial 50,000 as 'burn-in' and keeping the latter 50,000 with a skip of 50 using Gibbs sampling. The series of domestic and foreign LEI were estimated using the expectation value of the posterior distribution (plotted in figure 6.1). For each block and sub-block, dynamic factors are evaluated along with one common factor. The estimations are carried out using the DHFM code on MATLAB (Ng 2013).

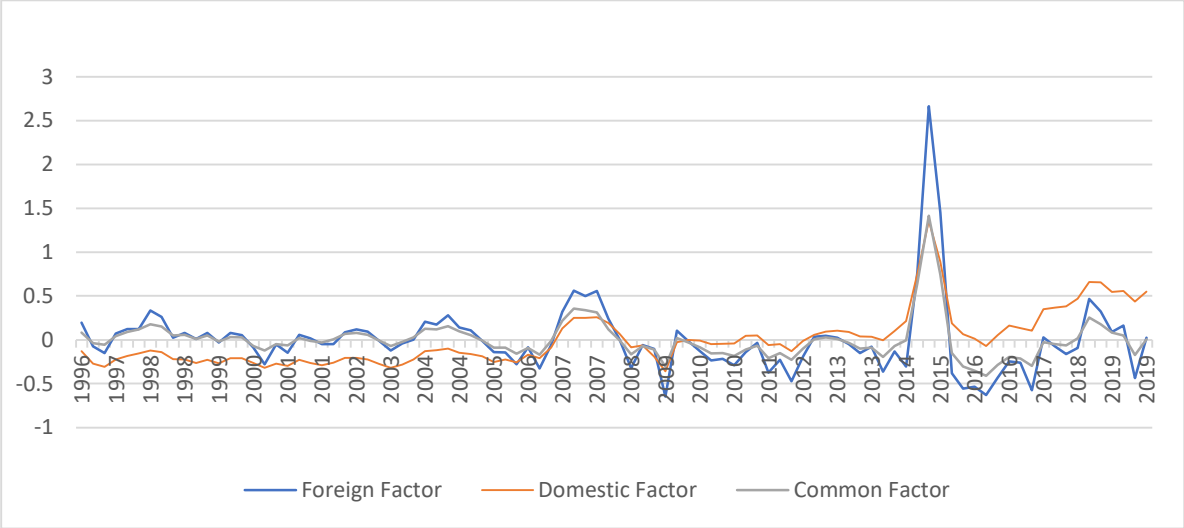

Figure 6.1 Evaluated posterior means of common factors, domestic and foreign leading factors from DHFM

Although evaluated factors are noisy, the estimated global factors closely reflect the business cycle well. The Asian economic crisis and the global economic crisis and the recovery in the respective periods are very well represented. As the crisis ascents, the factors seem to emulate and reflect co-movement with each other revealing the atrocity of the crises. Results depict a slow down during the GFC in 2008. Both the national and foreign factors are parallel to the common factor. Domestic factors are loosely connected to the common factor (correlates with the common factor by 0.61) as compared to the foreign factors which are correlated with the common factor with by 0.98. Also, the correlation between domestic and foreign block is 0.56. They can have a low correlation as they correlate through common factor. Despite having a

positive correlation between domestic and foreign variables, there are phases where they behave opposite to each other. When the model is estimated without any sub-blocks, that is, without the geographical division of the countries into regional blocks, the estimated correlation values are lower. The domestic block is correlated to a common factor by 0.56 and the foreign block with 0.74. However, evaluating the model with the subblock hierarchy deepens the analysis of the growth dynamics. Based on the geographical dimension, the block and the sub-block factors can be separated, reflecting different strengths. To understand the extent to which growth is affected by various factors, the factors are discussed with the estimated factor loadings using the conventional variance decompositions.

The four-level DHFM allows assessing the causes of the dynamics into four categories, namely, idiosyncratic, sub-block specific (regional), block specific (domestic and foreign) and common components (global components). The model's hierarchical structure implies that subblock factors hinge on superordinated factors. These interdependencies are taken into account during estimation. The regions demonstrate different sensitivity to various components over time and exhibit converging and divergent dynamics (Figure 6.2). For instance, the US states did not show gaining much momentum in growth, whereas Central Asian and South Asian countries have experienced growth post-crisis. Table 6.1 reflects the variance decompositions of the geographically divided regions with respect to other factors. The average share of idiosyncratic variance is about 70-90%, except for the sub-block of Middle East countries (39.42 %), this reflects it to be the most critical determinant of growth. The regional factors can explain 2 % to 40 % of the growth, it is more relevant to the Middle East countries and the South Asian countries as compared to the East Asian and Pacific region, which are found to be less prone to fluctuations in the regional factors. The block-level factors play an essential role for Middle east countries and least for the European Region. For the Indian economy, 41.87% of fluctuations can be explained by the block level variations. The common

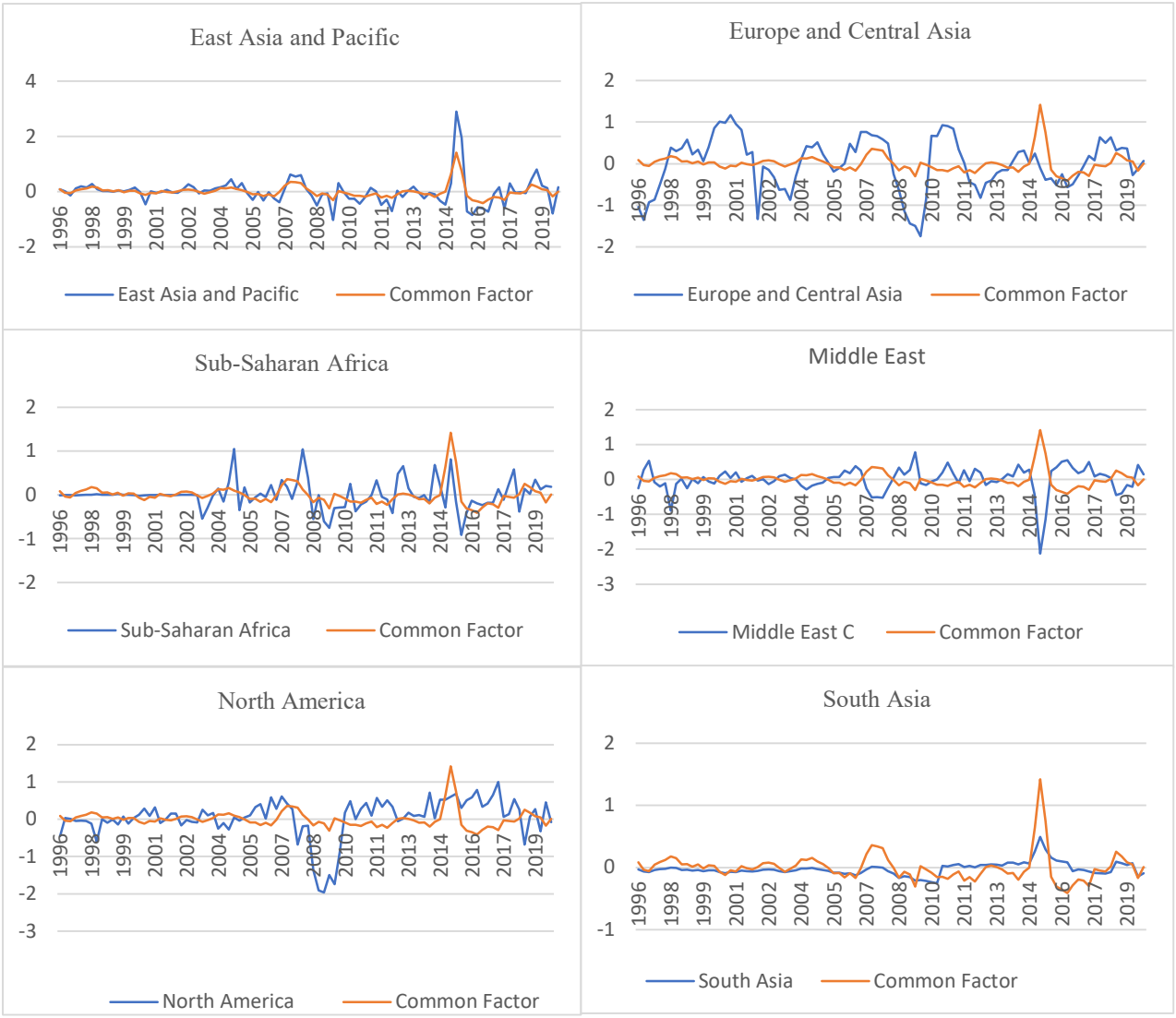

Figure 6.2 Evaluated posterior means of common factors with the posterior means of sub-block level factors

factor (global component), has a minimal impact on East Asian and Pacific region (3.55%) and Sub-Sahara African Countries (1.55%) and almost no effect on European countries (0.05%), South Asian countries (0.31%). For the Indian economy, 12.22 % of the variations attributed to the common factors, 41.8 % because of the Block-level factors and 54.1% from the idiosyncratic component. This is a reflection of the asymmetric degradation of global economic integration among these regions after the GFC.

The results are indicating a weak impact of global conditions on regional growth, which is not a situation for highly globalized nations, indicating less integrated regions. The findings are

consistent with the view stated by The Economist (2019) suggesting that the bulk of swings in growth is driven by country-specific components followed by the regional factors. The results are in line with the notion that growth and global integration has become more regional. However, in a crisis like situation, shreds of evidence of strong co-movements are found which reflect that globalization is alive. This decomposition of growth indicators may be necessary for explaining and forecasting domestic growth. Explaining region-specific variance for such a large share of growth may help policy-makers make more timely and accurate decisions.

Table 6.2 Variance decomposition of DHFM, the median share of explained variance (in percentages)

Block	**Subblock**	**Global**	**Block-level**	**Sub-block**	**Idiosyncratic**
Foreign Factors	East Asia and Pacific	3.6 [3.0,4.2]	3.1 [2.6,3.5]	2.8 [2.4,3.2]	90.6 [89.4,91.7]
	Europe and Central Asia	0.05 [0.0,0.2]	0.04 [0.0,0.1]	10.7 [9.7,11.7]	89.2 [88.2,90.2]
	Sub-Sahara Africa	1.6 [0.3,3.0]	1.4 [0.3,2.6]	23.8 [21.3,26.5]	73.31 [72.2,74.3]
	Middle East	39.4 [36,43.3]	39.4 [36.1,43.3]	39.4 [36.1,43.3]	39.4 [36.1,43.2]
	North America	9.56 [7.2,11.9]	8.2 [6.3,10.1]	6.9 [4.5,9.4]	75.4 [73.1,77.6]
	South Asia	0.31 [0.0,0.8]	0.27 [0.0,0.7]	35.93 [34.8,36.8]	63.5 [62.8,64.1]
Domestic Factors		12.2 [8.4,15.1]	41.8 [40.1,45.4]	0.0 [0.0,0.0]	54.1 [42.6,47.7]

Note: Figures in squared brackets represent 10% and 90% percentile points of distribution of a share explained by a factor inside a given subblock across different product category for different countries.

The obtained dynamic factors are further interpreted using GDP growth rates of India. Amongst all the regions European and Sub- Sahara African regions reflect a low degree of co-movement with the growth of the Indian economy. Whereas, growth is more synchronized with the East Asian and North American region (high R square). The regional factor educes differently from each other. A few reflect similar growth patterns, whereas some reflect divergent dynamics.

6.4 Time-Varying Parameter Regression

The factor-induced domestic and foreign leading indicator series (obtained from DHFM) are interpreted using GDP growth rates of India, to understand the time-varying dynamics between them using the TVP-R estimates.

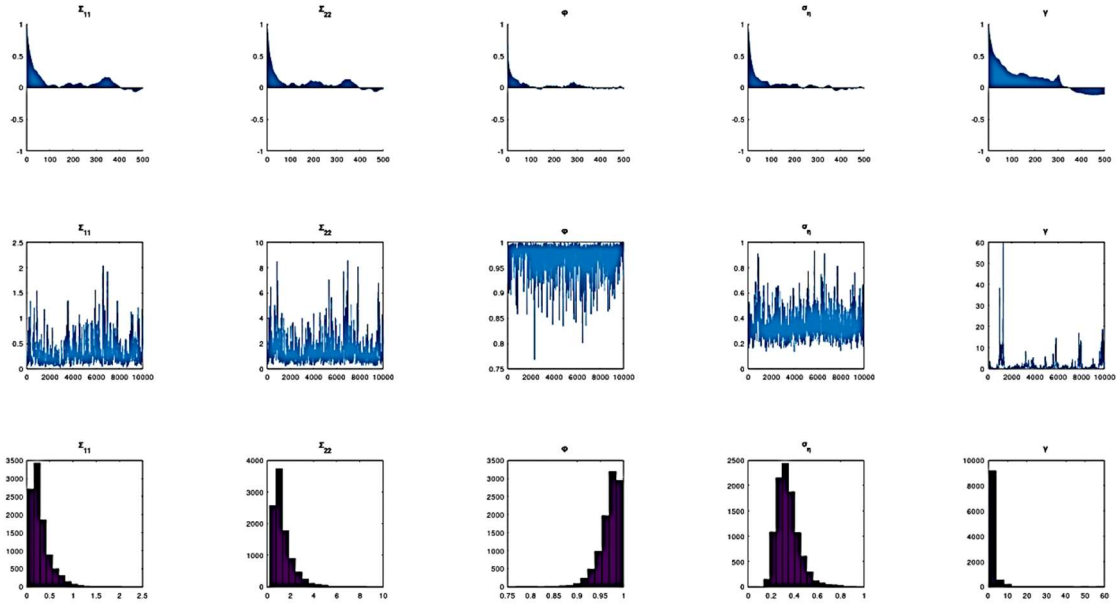

Figure 6.3 Estimation Results of the TVP Regression Model (with stochastic volatility)

Estimation results of 10,000 draws in Figure 6.3 suggests that the sample path is reliable. After the initial draws, the sample autocorrelations are low, indicating the strength of the sampling method to produce samples with low autocorrelation. Table 6.2 suggests the results of posterior means, standard deviation and the 95 per cent credible interval. Diagnostic tests for convergence and efficiency are performed following Geweke (1992), suggesting convergence to the posterior distribution at five per cent level of significance. The low inefficiency factors indicated efficient sampling for parameters.

Figure 4 plots the time-varying coefficients of the domestic factor and foreign factors, which reflects that the proportion of growth as explained by the foreign factors is increasing but at a

Table 6.3 Posterior estimate results of TVPR

Table 6.3a: With Stochastic Volatility						
Parameter	**True**	**Mean**	**St.dev**	**95% Interval**	**Geweke**	**Inefficiency**
α_1	1	0.2970	0.2190	[0.0570, 0.8709]	0.043	62.01
α_2	-1	1.2905	0.8419	[0.3672, 3.8139]	0.067	20.07
phi	0.95	0.9699	0.0225	[0.9140, 0.9969]	0.000	23.31
siget	0.5	0.3442	0.1002	[0.1972, 0.5838]	0.008	35.54
gamma	0.1	1.3804	2.5879	[0.0499, 8.4900]	0.333	71.38
Table 6.3b: With Constant Volatility						
Parameter	**True**	**Mean**	**St.dev**	**95% Interval**	**Geweke**	**Inefficiency**
α_1	1	0.9959	1.2574	[0.0095, 4.3000]	0.000	22.01
α_2	-1	1.7542	1.7757	[0.2193, 6.8982]	0.000	21.55
sigma		1.2479	0.1768	[0.9189, 1.5780]	0.000	74.28

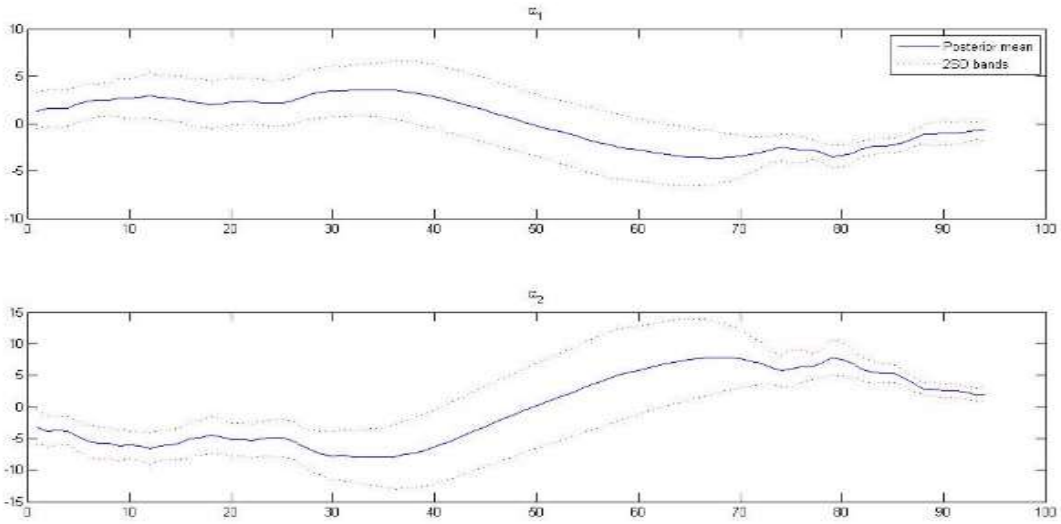

Figure 6.4 Estimation results of α_t

slower rate after a fall in 2008-09, signifying the pieces of evidence of the presence of slowbalization.

This trend is also supported by reflections on the regionalization of countries rather than globalization. Indicating that globalization has led to an era of sluggishness. This proves that while there is the in the post-recession period, the foreign factors exhibited a downward trend. The pace of globalization hence is positive, but the rate of growth is slow. This is so because most of the linkages are Deeping withing the regional blocs. The value chains in North America, Europe and Asia are sourcing more from nearby countries. Asia and Europe have

exhibited trends of spurge in intra-regional trade since 2011. Asian organizations are reported to have more exports within the continent in 2017 (The Economist, 2019).

6.4.1 TVP regression Stochastic Volatility

Figure 6.4 plots the time-varying coefficients of the domestic factor and foreign factors, which reflects that the proportion of growth as explained by the foreign factors is increasing but at a slower rate after a fall in 2008-09, signifying the pieces of evidence of the presence of slowbalization. This trend is also supported by reflections on the regionalization of countries rather than globalization. Indicating that globalization has led to an era of sluggishness. This shows that although the global economy continues to be integrated, it is at a much slower speed.

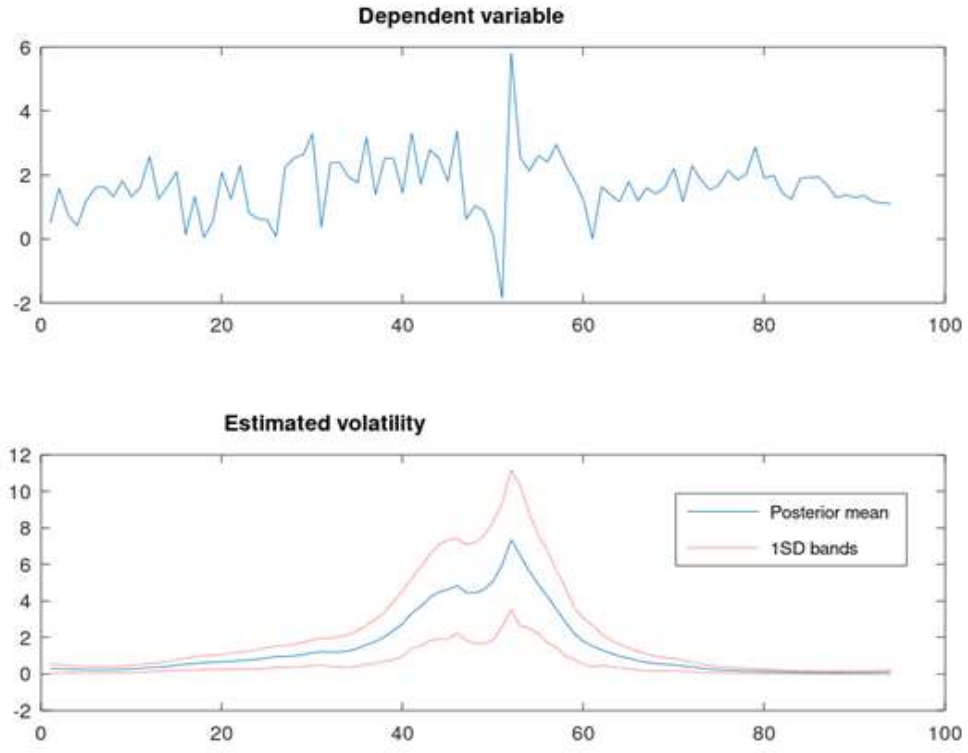

Figure 6.5 Estimated volatility, h

The stochastic volatility (Figure 6.5) shows moderate movements except during the GFC period 2008 and reflect a slow recovery and hence a slightly upward trend after 2010, where

the world economy was recovering. In the post-recession period, the foreign factors exhibited a downward trend. The posterior estimates follow the true values, which are included in the credible intervals. The growth of globalization hence is positive, but the rate of growth is slow. This is so because most of the linkages are deepening regionally. The value chains in North America, Europe and Asia are sourcing more from nearby countries. Asia and Europe have been reported to have more exports within the continent in 2017 (The Economist, 2019).

6.4.2 TVP Regression constant Volatility

Further, the constant volatility model is also estimated to examine the role of stochastic volatility. Figure 6.7 suggests that the posterior means are not close to the true states for the time-varying coefficients. Also, the credible intervals are too wide to capture the movements.

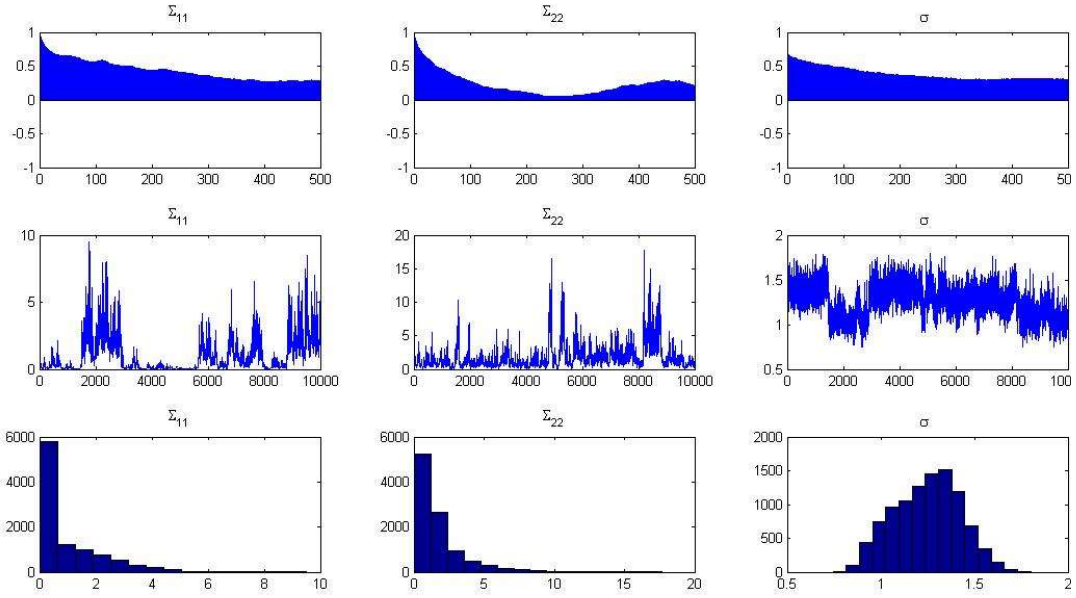

Figure 6.6 Estimation Results of the TVP Regression Model (with constant volatility)

of the true values (Figure 6.6). Over-estimation of the constant volatility can be the possible reason for this as the constant volatility model ignores the behaviour of volatility change

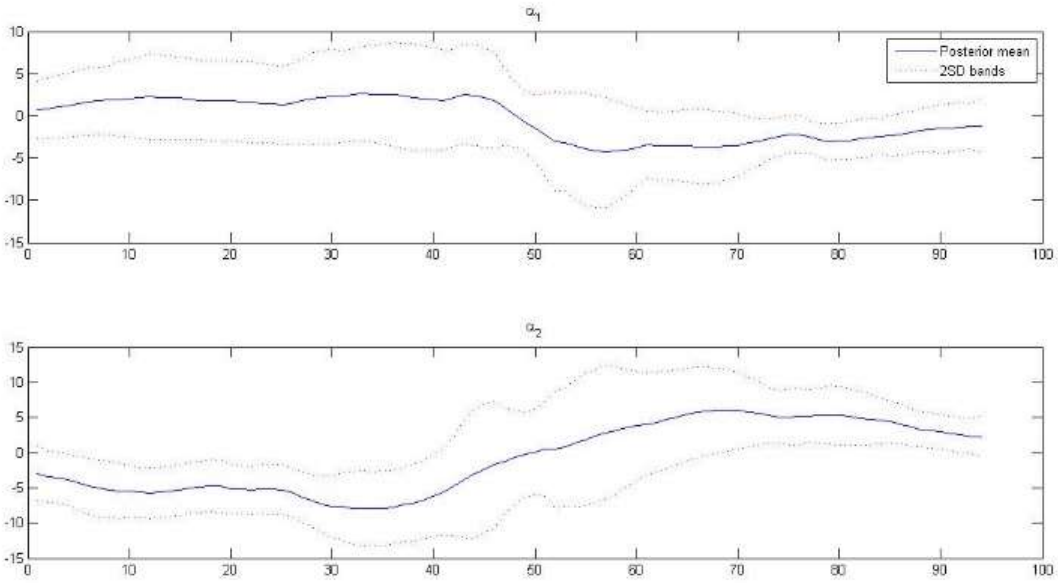

Figure 6.7 Estimation results of αt (Constant Volatility)

6.5 Time-Varying Parameter- Vector Autoregression

6.5.1 TVP VAR Stochastic Volatility

The estimations from a univariate TVPR estimation are further extended to a multivariate TVP-VAR model. The factor-induced domestic and foreign loadings (obtained from DHFM) are interpreted using GDP growth rates of India, to understand the time-varying dynamics between them using the TVP-VAR estimates. The sample path is reliable, and the sample autocorrelations are low, indicating the strength of the sampling method to produce samples with less autocorrelation. (Figure 6.8). The low inefficiency factors indicated efficient sampling for parameters. Presence of structural breaks is confirmed with the presence of mild volatility during the periods of the Asian crisis and high volatility during the GFC. The sources of time variation in TVP-VAR model includes the coefficient as well as the variance of the shocks. Figure 6.9 shows the simultaneous relations of the three variables (p, x, i) where *p* represents the foreign factor loadings, x represents domestic factor loadings, and *i* represents

the ΔGDP_{t+1}, indicating the proof of the nature of globalization, demonstrated by the amount of development explained by international influences.

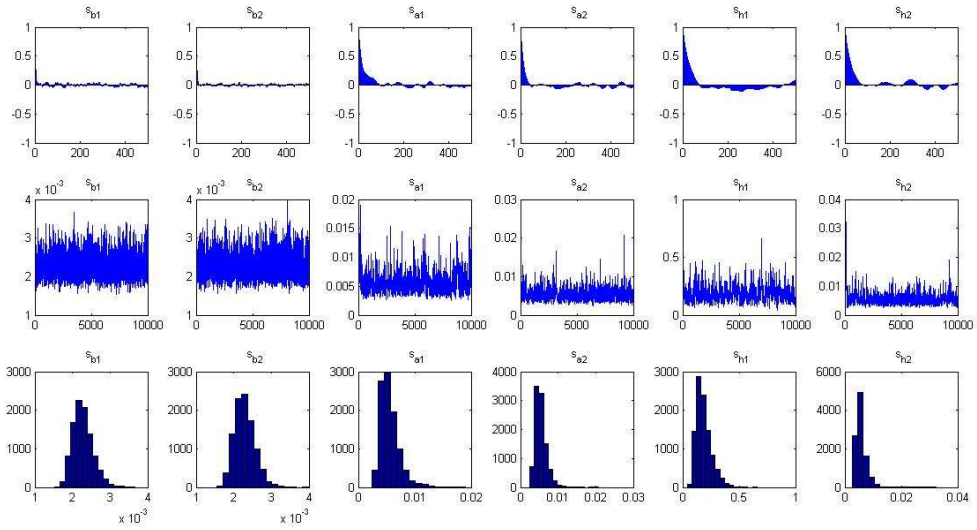

Figure 6.8 Estimation Results of the TVP-VAR Model (with stochastic volatility)

Table 6.4 Posterior estimate results from TVP-VAR model

Table 6.4a: With Stochastic volatility					
Parameter	**Mean**	**St.dev**	**95% Interval**	**Geweke**	**Inefficiency**
sb1	0.0023	0.0003	[0.0018,0.0029]	0.885	7.55
sb2	0.0023	0.0003	[0.0018,0.0029]	0.011	6.04
sa1	0.0056	0.0017	[0.0034,0.0102]	0.641	40.75
sa2	0.0054	0.0015	[0.0034,0.0091]	0.951	20.64
sh1	0.1859	0.0677	[0.0934,0.3535]	0.989	37.8
sh2	0.0057	0.0021	[0.0034,0.0105]	0.113	47.97
Table 6.4b: with constant volatility					
Parameter	Mean	St.dev	95% Interval	Geweke	Inefficiency
sb1	0.0029	0.0006	[0.0020,0.0044]	0.407	20.92
sb2	0.0028	0.0006	[0.0020,0.0042]	0.982	17.01
sa1	0.0060	0.0023	[0.0034,0.0119]	0.047	58.99
sa2	0.0056	0.0017	[0.0033,0.0097]	0.755	22.65
sh1	0.1810	0.0710	[0.0798,0.3481]	0.159	74.71
sh2	0.0059	0.0022	[0.0034,0.0113]	0.311	33.64

This shows that, although the global economy continues to be integrated, it is at a much slower pace. The simultaneous relationships plot the effect of other variables dependent on recursive recognition on one unit of structural shock. With little fluctuations until 2014-15, the simultaneous foreign factor relationship with domestic shock (p → x) remains positive and

then begins to decline after that. Whereas, the domestic factor's simultaneous relationship to the growth rate (x ⟶ I) is smooth and growth factors (p ⟶ I) differ with some variations over time until 2014 and are negative after that. The declining trend in the global amount of trade in merchandise is supporting this. The results of TVP-VAR estimations with constant volatility suggest similar results.

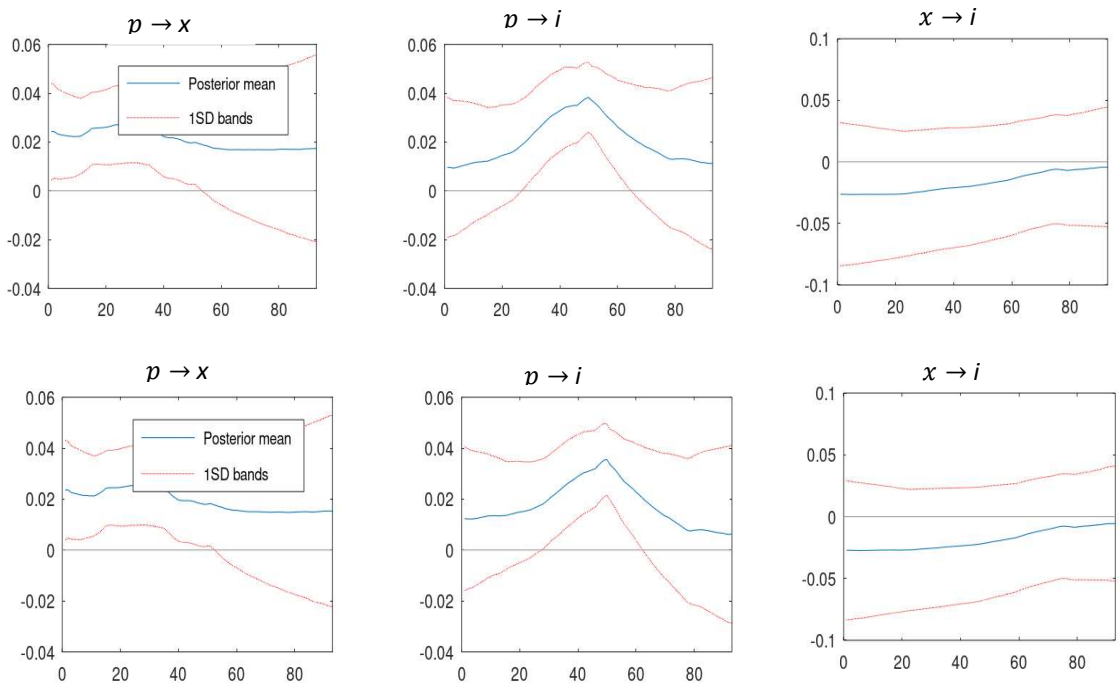

Figure 6.9 Simultaneous Relations of the variables: (Row 1 with stochastic volatility and Row 2 with constant volatility)

Figure 6.10 represents the posterior stochastic volatility. Stochastic volatility of foreign factors showed a slight upsurge during GFC around the year 2008. The stochastic volatility of GDP growth shows moderate movements in the volatility in domestic factors reflects smoother yet increasing trend. In contrast, the foreign factors reflect a slow recovery and hence a slightly upward trend after 2010. In contrast, a significant upward trend is seen in the year 2014, where the world economy was recovering. However, after 2015, again, the foreign factors exhibited a downward trend. To gauge the evolution of the globalization effect from foreign factors, the

time-varying IRF (Figure 6.11) and Forecast Error Variance Decomposition (FEVD) (Figure 6.12) of a few innovations in domestic and foreign factors. IRFs in the TVP-VAR model are

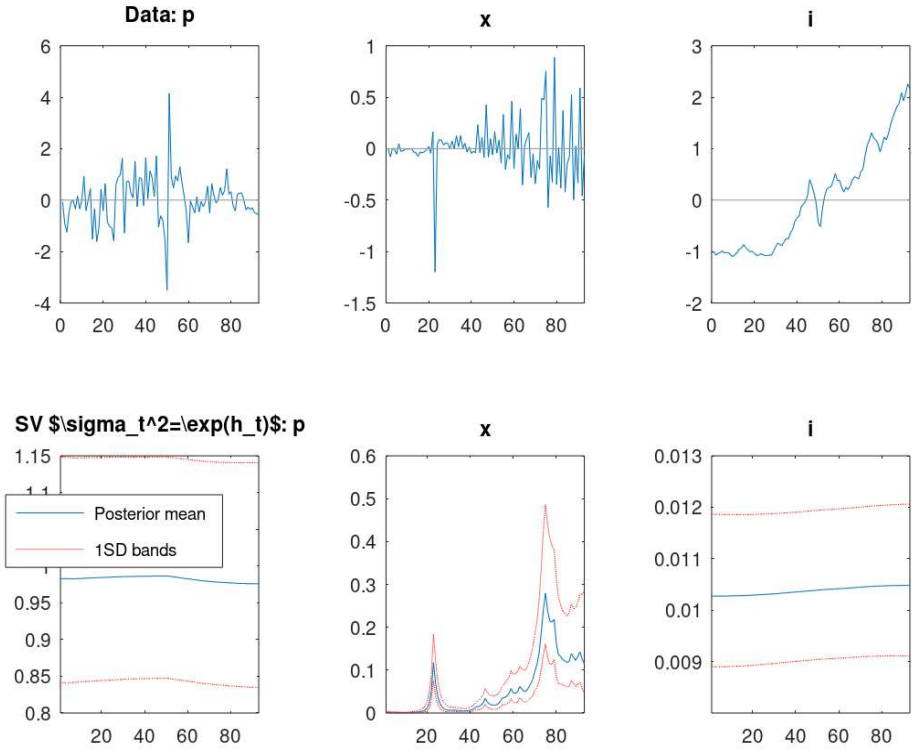

Figure 6.10 Stochastic Volatility, h

estimated at all points in time. The time-varying coefficients are used to estimate the recursive innovation of the variables. The responses show the size of the impulses for one -quarter, one year and two-year horizon over time. The impact of the GFC was high during 2008-10 and reduced in 2012. The IRFs show the responses for the selected horizon at all points in time. The IRFs reflect that with shock in the foreign factors, the impulse responses of GDP growth rate stay positive in the next quarter and reduces in a year but still is not close zero. In the long term, the impact of the foreign shock on growth decays.

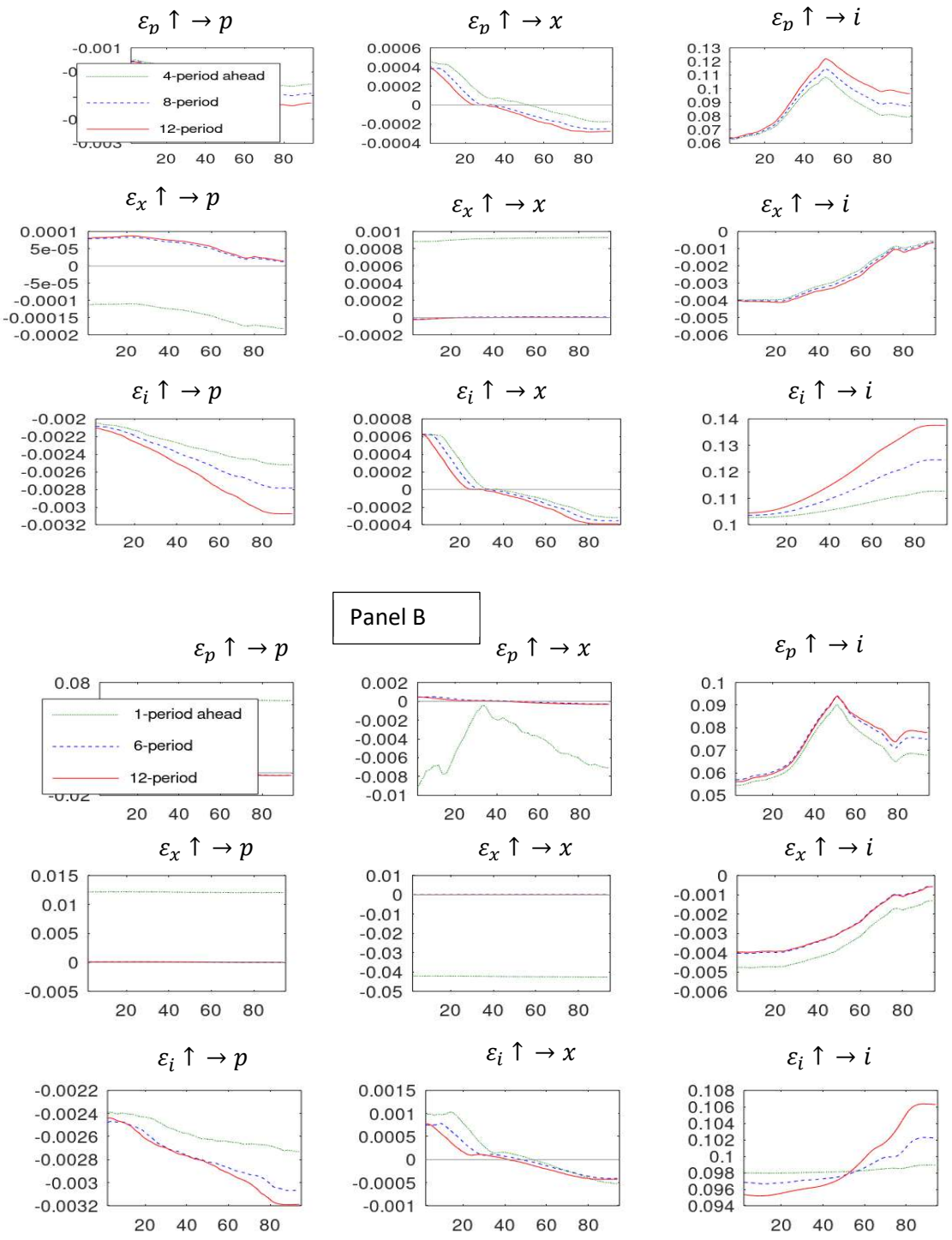

Figure 6.11 Impulse Response Functions (Panel A with stochastic volatility and Panel B with constant volatility)

To identify the shocks that explain the growth fluctuations, we use FEVD from the three identified shocks (Figure 6.12). During the Asian crisis1998-99, the GFC 2006-08 and the

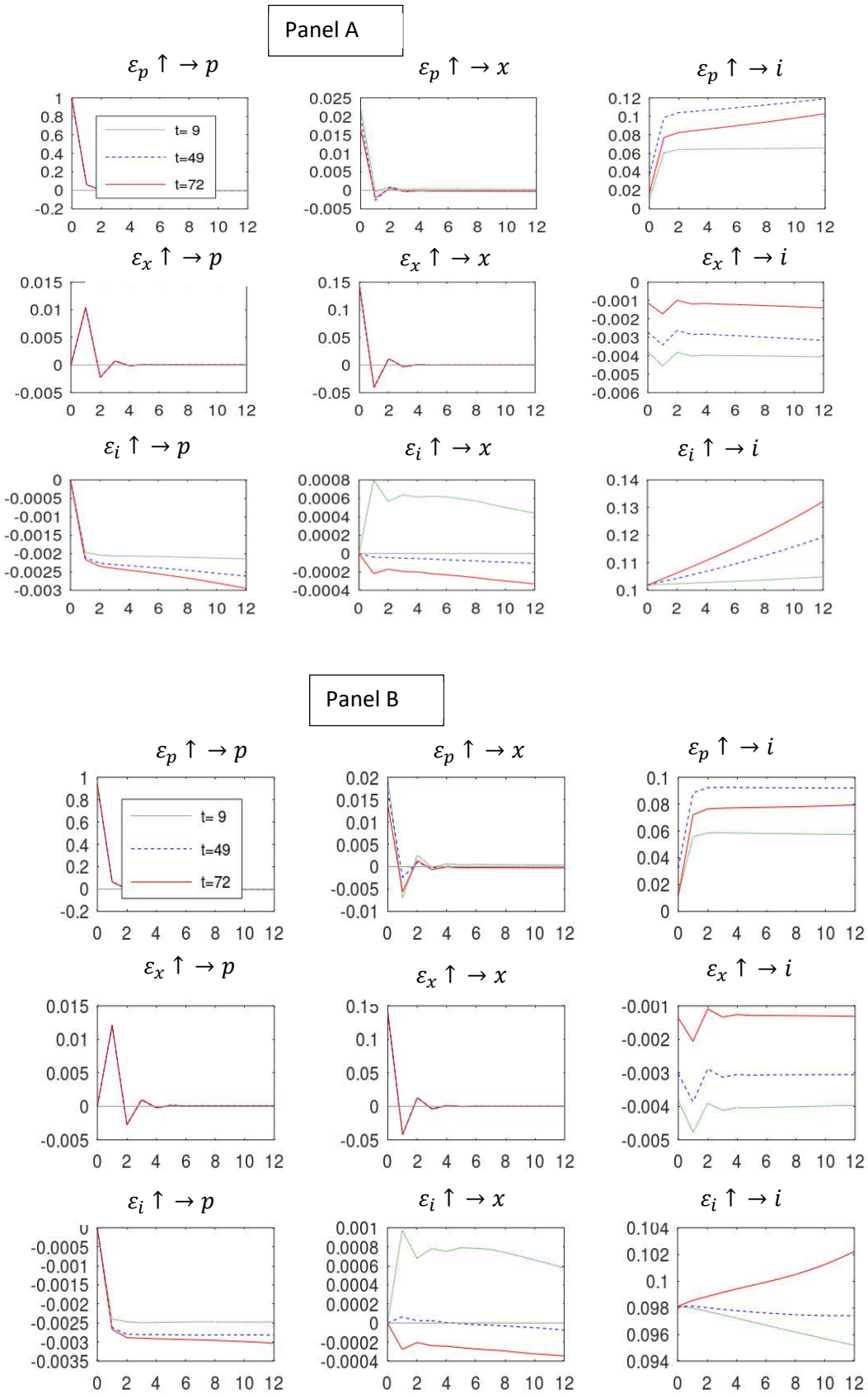

Figure 6.12 FEVD (Panel A with stochastic volatility and Panel B with constant volatility)

Russian crisis, 2014, the foreign factors impacted the Indian growth negatively in the range 0-8 per cent. Whereas, the domestic factors contribute to fluctuations in growth dynamics in the range of 0-14 per cent. The impact of these foreign shocks on the growth of Indian economy usually is severe in the year 2008-10, and later, in the long run, die off.

However, the fluctuations in the foreign factors bring about significant fluctuation in the domestic factors also (0-8 per cent), which do not wither quickly. This suggests that the contagion in the foreign sector does not impact the growth directly but slows down the movement of the domestic sector. The results also suggest that while the contribution of the foreign indicators to domestic growth reduces, the contribution of domestic factors to domestic growth increases.

6.6 Chapter Conclusion

The chapter aims to find traces of slowbalization In Indian economy and the results highlight that India too is experiencing slowbalization instead of globalization. Regionalization (regional integration of the economies) rather than globalization is both the cause and the effect of slowbalization.

CHAPTER 7- COVID-19 AND GLOBALIZATION

7.1 Introduction

Post 1991, there were many hiccups like the Asian Financial crisis, the dot com bubble and the Russian debt default, but none ever invited the debate on the reversal of globalization, and it surpassed all. The Global Financial Crisis 2008 (GFC), however, was a turning point. The GFC witnessed an economic setback leading to shadow protectionism in the form of regulations, trade agreements and government intervention. Not only economic crises, globalization has witnessed many epidemics ranging from Spanish flu in 1918, SARS in 2003 and Ebola in 2014. Locked borders, least flights and passenger's movement, dipped trade volumes, represents how the medical shock with the spread of novel Coronavirus, widely known as COVID-19, has impacted the economic, social, political, technological and environmental health of the nation's worldwide. (WHO, 2020; McKibbin & Fernando, 2020). COVID-19 is following the pattern of "Butterfly Effect" propagated in chaos theory, how a small change may bring unpredictable changes at a distant place (Alblooshi, 2020). Baldwin and di Munro (eds.) (2020) said as the G7 countries sneeze, the rest of the world will catch a cold, as they share 60% of world supply and demand (GDP), 65% of world manufacturing imports, and 41% of world manufacturing exports. The presence of globalization has contributed to the spread of the pandemic. Though it brings with it both the perils and benefits. The analysis of the impact of COVID 19 on various dimensions of globalization will help us forecast the future shape of globalization with respect to the Indian economy. Though it is premature to anticipate the impact at this stage as the world is still unfolding the consequences, we can forestall some effects using the KoF index of Globalization and the Elcano Global Presence Index. For once in ages, countries are adopting inward-oriented strategies leaving the

researchers to wonder its impact on globalization. These trends pave the way for an anti-globalization or protectionism sentiment, trending towards the concept of 'Slowbalization' (D'urbino, 2019). As it sounds, it means: making the togetherness and reciprocity between nations 'slow'. Globalization has reflected the rising interdependence of economies, societies and communities across the world over the past few decades, along with prosperity and rapid economic development (Zhu, 2020).

As Qadri (2020) mentions, we have seen the world becoming a gated (Greg, 2008) and a gauged globe (Qadri & Bhat, 2017). Now, with this pandemic, it is becoming a "regulated globe". Researchers are anticipating different opinions on globalization, while a few anticipate the death of globalization, others believe the wings of globalization will be clipped, but it will not die (Huaxia, 2020; Hasan, 2020). The end of globalization is anticipated because it was already strained to the breaking point post-GFC; secondly, it catalyzed the spread of pandemic because of the liberal travel and trade and lastly the failure of internationalism in the face of the crisis. In comparison, scholars have suggested that the pandemic is an opportunity for a variety of political movements, ranging from activists who have long advocated for more sustainable development to those who fear injustice or the fragility of global supply chains (Leonard, 2020).

The objective of the study is to examine the structural effects of Covid -19 on globalization. We try to trace possible changes in the dimensions of globalization for the Indian economy, as suggested by the two indices and forecast the nature of globalization in the coming future. The methodology involves curating news-papers and popular articles and generate insights from the text network analysis to create a narrative that best explains the current situation and policy responses. The article concludes that the Indian economy has already been witnessing

slowbalization since GFC (Gupta and Kumar, 2020) and shall be witnessing slower pace of globalization with regionalization. Still, the globalization is not expected to reverse.

7.2 Slowbalization

The recent trends in globalization are exhibiting a different picture. Manoj Joshi (2020) quotes *The Economist* (July 2019) that "globalization is becoming regionalization." He reveals the patterns of supply chain fragmentation in three industries. As per him, the textile sector is globally footloose, the automobile industry is forming regional hubs, and the electronics industry is majorly based in china. A trend of 'near-shoring' or 'reshoring' of supply chains is evolving.

De-globalization of the world economy refers to a phase of uncoupling. Regional markets have been more relevant than global ones since GFC and have also marked slow pace of global integration. The last decade was already witnessing an acceleration in protectionism as visible with 'America first', "Make in India' campaigns. With this pandemic, the situations got worse. Global nations, instead of coordinating to find a solution together, are handling the situations individually. Global trade has dropped drastically by 27 % in the first two quarters of 2020 (IMF, 2020), however, has recovered slightly in the third quarter as per the UNCTAD. Commodity prices of crude oil, agricultural raw material, minerals and metals also dipped with the fall in the global trade.

Referring to his books "The Butterfly Defect" and "Age of Discovery," Ian Goldin (2020) re-examines the pros and cons of globalization and believes that the pandemic may alter the essence of globalization. Still, it will not bring an end to globalization. Falcone (2020) is of the same view that slowbalization has increased in the pandemic. Travel and trade movements will be back after the pandemic is over, and further international movements across national

boundaries will accelerate globalization. Goldin also related outsourcing, distribution time, customization and protectionism with fracturing of demand chains and supply chains. globalization may have slowed in some countries, but its centre of gravity would move to Asia. Smith and Dumienski (2020) suggest that unlike in the case of past epidemics, there is now the technological capabilities to purchase goods and services directly from suppliers across the globe.

Laura Clarke (2020) in one of her speeches, mentions a McKinsey report claiming that in Asian countries, 60% of total trade has been regional and "Asia-for-Asia" supply chains existed in the pre-pandemic period. Although global trade shall always be instrumental for the growth of developing economies, COVID-19 may help reinvigorate efforts to improve the resilience of the supply chain, strengthen the depth of trade ties and, through regionalization, promote broader cooperation between trading partners. With countries developing effective and flexible supply chains with neighbouring nations, regionalization may be the key to minimize economic shocks by reducing the chance of over-dependence on trading with the world's largest developed economies.

Olivié and Gracia (2020) using the Elcano Global Presence Index highlight that despite a significant slowdown and mutation towards softer forms of internationalization, globalization isn't dying. The study tries to compare the impact of the current crisis as against GFC. They believe that the soft dimension will contribute to globalization, considering the potential for constraints on people's travel (which will impact the variables of education, tourism and migration). Above all, this can be explained by the anticipated dynamism of the media, technology and science factors, the industries that are set to develop, the consolidation of the technology divide between countries and regions, as well as how the positions of different countries and blocs (such as China, the US and Europe) are increasingly shaping globally.

The Elcano Global Presence Index is a synthetic index that orders, quantifies, and aggregates the external projection of 120 countries. Global presence is divided into three dimensions: economy, defence, and soft presence. The index provides the tool for understanding the international projections of economies and for observing the trends in the globalization process (Olivié *et al*., 2017, 2018). The KOF globalization Index too is a composite index measuring globalization for 203 countries and territories and spans from 1970-2017. It measures the economic, social and political dimensions of globalization and distinguishes between the de facto and de jure measures and assigns time-varying weights to the factors used in the index. The original index was introduced by Dreher (2006). The index is widely used to measure and examine significant consequences of globalization.

These indices are subject to a lag of seven to eight quarters in exhibiting the changes in the dimensions and the reflection of such a structural shift in the index. Consequently, until 2021, the results of the COVID-19 pandemics are not likely to imply any transition. With these caveats in mind, we try to gauge the performance of the variables, to anticipate the possible impact of the pandemic on globalization.

The article is structured on the basis of the insights generated from the text network analysis developed by Paranyushkin (2019) The analysis was carried out curating a variety of articles published in journals and newspapers related to COVID-19 and globalization using InfraNodus, a web-based open-source tool. The algorithm portrays text as a network and, based on the co-occurrence of terms, recommends the most prominent words in a discourse. The words or the concepts become the nodes and their respective relations become the edges. Such representation of text aids in a coherent expression of ideas. A few other techniques of text visualizations are suggested by literature like iVis Clustering, VisiRR to name a few are probabilistic methods and are not available for general public. The InfraNodus, however is

available on open-source software, uses graph theory along with probabilistic theory to identify topical clusters, which helps in a better understanding of textual discourse structure.

The temporal aspects are folded to represent an image, highlighting the overview of chronological phenomena. The method so adopted helped us to get a better insight into the hidden agendas within the text and a clearer understanding of the narrative structure. The proximity of the words and the density of their connections are set to encode the relationship of the words avoiding the subjective influences. The method is used to see impact of COVID-19 on various dimensions of economy by identifying these dimensions from the clusters of co-occurrent words. The newspaper, magazine and journal articles focusing on COVID- 19 and globalization are identified. To process the articles, first the text normalization is done to reduce redundancy and to keep the morphological root of each word (like India's, "Indian" becomes "India"). Then the meaningless words (like "is", "an", "are" etc.) are removed. "Stop-words" collection present in the library of the software is used. Finally directed network graph is made with the text. The nodes with highest betweenness centrality suggest the most influential keywords, that is, the nodes appearing more frequently on the shortest paths between two nodes. On the basis of modularity, we apply community detection algorithm to unleash densely connected group of nodes. This is used to construct the topical clusters that is the group of words that appear together in the text followed by application of 'Force-Atlas Algorithm' condensing the densely connected clusters. This gives us the clearly defined community structure and topical clusters. The discourse structure is also measured based on three criterions; modularity (M), connected component (c, percentage of words in topical cluster with maximum nodes) and Shannon entropy (E, dispersal of influence among topical clusters). The discourse is measured as Dispersed, diversified, focused and biased. The discourse that measures dispersed ($M > 0.65$, $C < 50\%$ and $E > 1.5$) mean that discourse contains some topics that are weakly connected. High modularity is exhibited, the community structure is highly

pronounced and the influential words are distributed among the communities. A diversified discourse (0.6>=M>0.4, C <50% and E > 1.5) measures high modularity and pronounced community structure with some topics having high number of connected topics. A focused discourse (0.4 >M>=0.2 and E > 1.5) or (M>0.4, C > 0.5 and 0.25 <E < 0.75) exhibits medium modularity, communities are present but are not easily detectable.

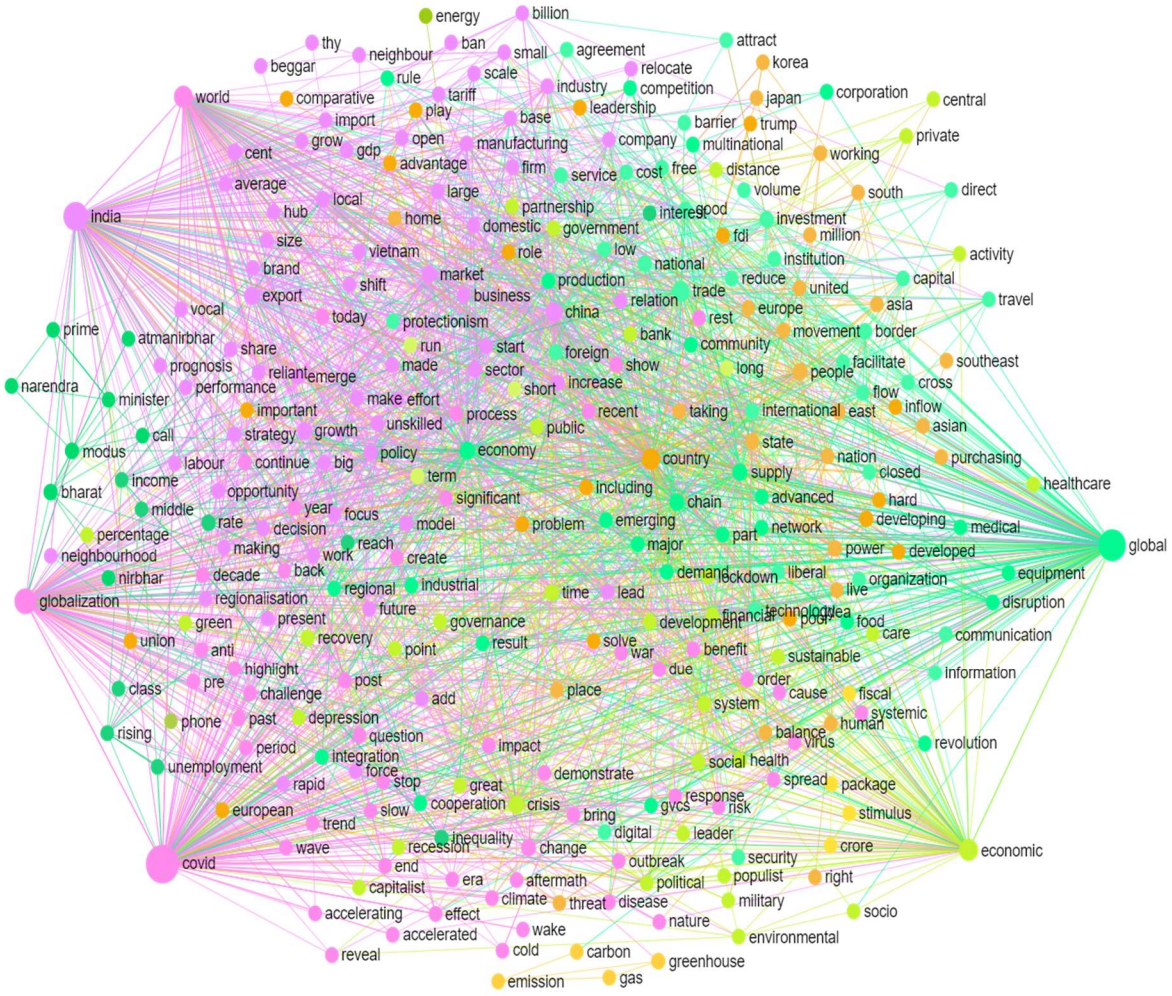

Figure 7.1 Text Network based on newspaper and journal articles

The influential words are connected to one topic and hence the discourse is focused on a few topics and other topics are weakly presented. A biased discourse (M<0.2) is low on modularity with no detectable communities and the influential words are concentrated around one

perspective. Finally, the representation is used to build the narrative that follows the dynamics of globalization during and post pandemic with respect to Indian economy.

The text network analysis generates 300 nodes and 2433 edges (co-occurrences) (Figure 7.1). The average degree is 8.11 representing the number of nodes every node is connected to. Colors represents contextual clusters and topics that are closely related, whereas, words that are far from each other appear in different contexts. Size of the nodes suggest the betweenness centrality, that is, number of the themes each node is connected to. The most influential topics of the network are India, China and market. Most influential elements of the text contain themes like Covid, globalization, economic, trade, technology, recovery etc.

7.3 Impact on the dimension of globalization in Indian Economy

Besides intimidating human life, COVID-19 caused "ripple effect" on the intertwined economies via economic, social, political and environmental channels. We weigh how India's global position has fared during the pandemic. To stave off the spread of the virus, the global economies, including India, entered a lockdown, which halted economic activities. Figure 7.2 reflects the 527 edges associated with the node “India”.

7.3.1 Impact on Economic Dimension

The review suggests that for the Indian economy, the pan caused "triple whammy" witnessing demand shock, supply shock and a financial shock. Before the Covid-19 crisis, the economy was already undergoing a demand-led slowdown (Gupta and Kumar, 2020). The lockdown and uncertainty of the future led the consumers to postpone their consumptions. Slowdowns can be seen in the passenger car sales, Industrial Production Index, demand for inventory, demand for petroleum and tourism, to name a few. The service sector too is not spared, IHS Markit Purchasing Managers Index (PMI) slipped down drastically (Singh, 2020) The manufacturing

sector was still better off owing to the part functioning of production of essential goods. The financial industry is witnessing illiquid markets. (Beck, 2020; Cecchetti and Schoenholtzon, 2020). The Bombay Stock Exchange Sensex and National Stock Exchange NIFTY 50, both crashed, the benchmark sovereign bond has witnessed high volatility during the first few weeks of the epidemic spread in India.

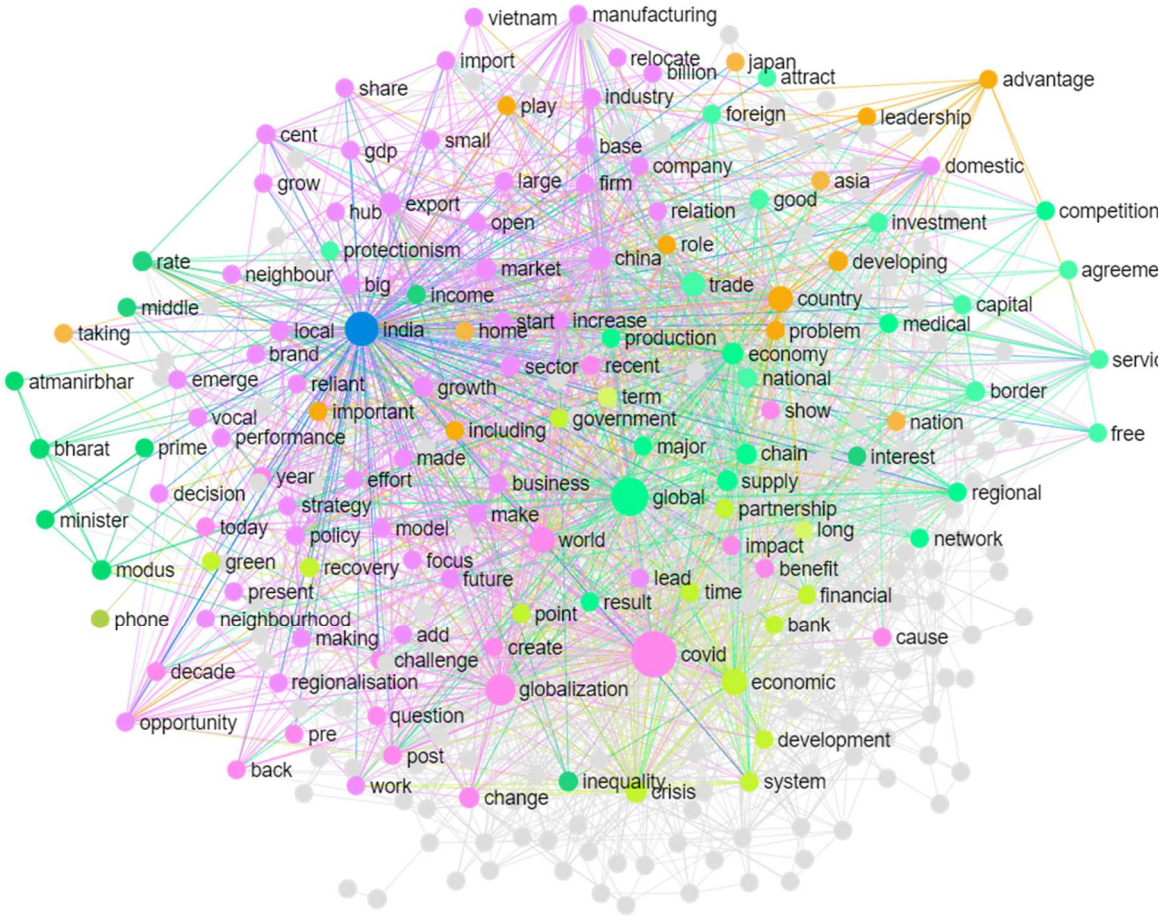

Figure 7.2 Text Network for the node- India

It is now showing a downward trajectory, representing the investors' movement to the safety of government bonds (Singh, 2020). It is challenging to measure the magnitude of damage caused by COVID-19 because of substantial informal economy in India and hence the lack of the high- frequency data. However, RBI's Industrial Outlook Survey 2020 suggest a worsening of demand indicators. World Bank and IMF project the growth rate for Indian GDP to be

between 1.5 – 2.8 per cent only. The pandemic invites thoughtfulness over India's resilience. The economic dimension as suggested by the literature is depicted in the figure 7.3. De-coupling of global economies is reminiscent of the slowbalization in this pandemic as majorly evident in the attenuating of the Global Value Chains (GVCs) (Javorcik, 2020).

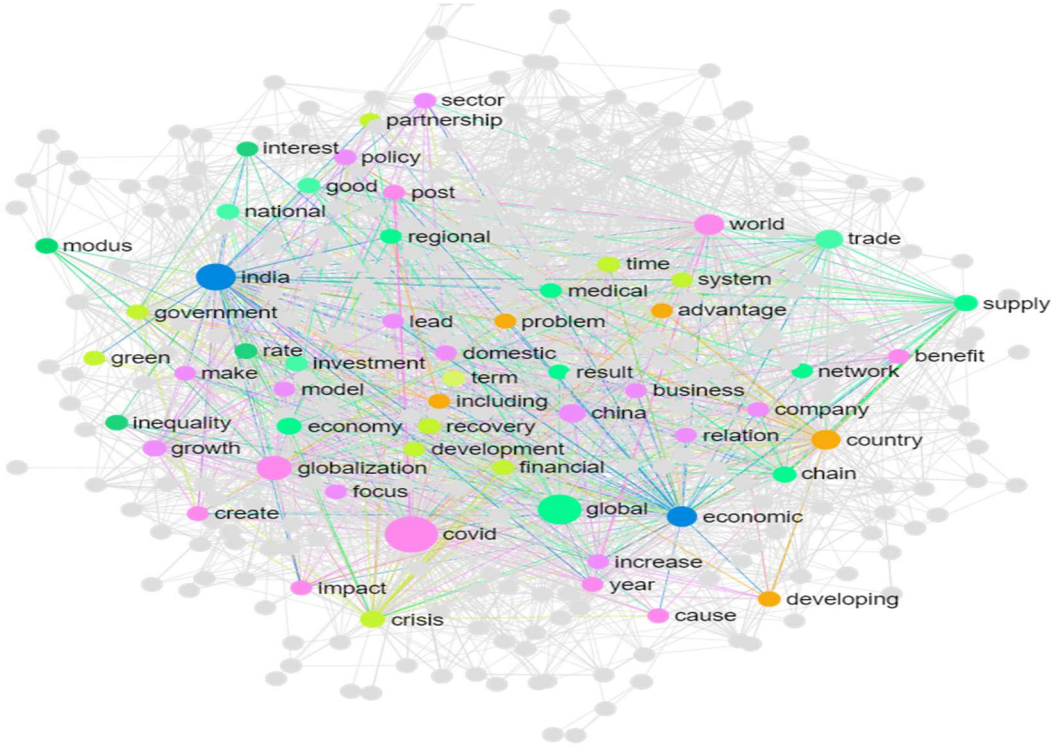

Figure 7.3 Text Network for the node- Economic

World Trade Organization (WTO) had predicted that the global trade volumes could decline by 13-32% in 2020. The transmission effects of COVID-19 can find the routes in globalization. The consequences are even more significant – and devastating – in the developing world. India's exports and imports, estimated at $141.82 billion and $127.76 billion, respectively, during April-July FY21, have contracted by 21.9% and 40.7% when compared to the same period last year. This clearly suggests that the pandemic has impacted India's global trade badly (IMF, 2020). Interactive complexity and tight coupling, as suggested by Charles Perrow's normal accident approach, can also be inferred as two intrinsic aspects of economic globalization. The former explains the level and type of interconnections amongst the nations;

the latter explains whether the connections are tightly coupled enough to let a change in one dimension to have spilling effects over other dimensions. Following the principle of comparative advantage and technological up-gradation, countries have become interdependent (Jackson et al., 2020a). The world economies are integrated through trade and most importantly, global value and supply chains. (Bloom, 2020) The interdependence of nations ripples the shocks throughout the world. Alterations in production patterns would also impact trade. The crisis has brought to fore the vulnerability of just in time delivery and outsourcing. As economies are opting inward-looking strategies, and the consumers are shifting towards local consumption of domestically manufactured goods. GVCs enabled an economy to locate less expensive production centres across the world. If the economies now plan to reshape their industrial chain and opt to manufacture domestically, they would have to pay higher prices for the same product manufactured at lower price across the world.

Because of massive lockdowns and slow- growth of the economy, halted production led to job loses, unemployment and poverty. A shift like jobs from regular to online services may give rise to the 'gig-economy' that is, replacing the permanent employees with seasonal, shift-based employment. On the contrary, this may have a positive side, as the online work enabled productivity-killing the long-haul travel, the international employability may increase, leading to the globalization of professional services. Many essential services cannot be done in another country, but banking, law and design can be done often at a far lower cost. Also, as there is local production, one may witness the trend of 'glocalization' appearing up.

FDI disturbances are no exception. Global FDI flows are forecasted to tighten between 30 to 40 percent during 2020/21 according to UNCTAD (Baldwin & Weder di Mauro, 2020). As developing economies are more dependent on FDI over the last few decades, the dip in FDI is going to hit them.

The liberalization reforms have enabled India to become a dominant market in terms of computers, drugs, telephones, solar energy, organic chemicals, and electric vehicles. India lags in its capacity to manufacture, which has contributed it to become an importer of various goods.

'Butterfly defect' as coined by Ian Goldin and Mike Mariathasan explains how the problems cascade through complex interdependencies making economic globalization a very complex system which gives rise to systemic risks. The economies have to work on the options to manage such risks and increase resilience.

7.3.2 Impact on Social Dimension

Globalization catalyzed the spread of the virus with the cross-border movement of people. As the spread of the pandemic exposed the economies to more social and political realities, it has blown the Overton Window (scope of propositions acceptable for the political discussions) wide open. The lockdown and low levels of education and skills among the poorer sections of societies left them jobless, and state interventions have increased. The inequalities and the rich-poor divide have widened in developing economies as they do not offer enough social security systems for the poor.

Furceri et al. (2020) analyzes previous pandemics and find that the net Gini indices of inequality had a substantial rise. This leads to the lack of access to necessary resources for health and education. (Ogunode et al., 2020). After the health crisis subsides, children from the impoverished families had to drop out of schools and join the workforce early to make ends meet in the household, apart from losing a substantial period of education during pandemics. (Daly et al., 2020; Burgess & Sievertsen, 2020). Such results expand and fill the gap across several levels of wealth. In the context of political upheavals, these emotions can materialise. Therefore, the consequences of deprivation on pandemics are hazardous for populations and

go far beyond the immediate health threats (Figure 7.4). A modern age of collaboration was intended to breed the twin patterns of globalization and information technology. Instead, they have created a new form of international competition. Digitalization is one of the causes of globalization, but not the only source. Increasing online B2B trading or even transforming blockchain distribution, digitalization will reduce friction in global trade.

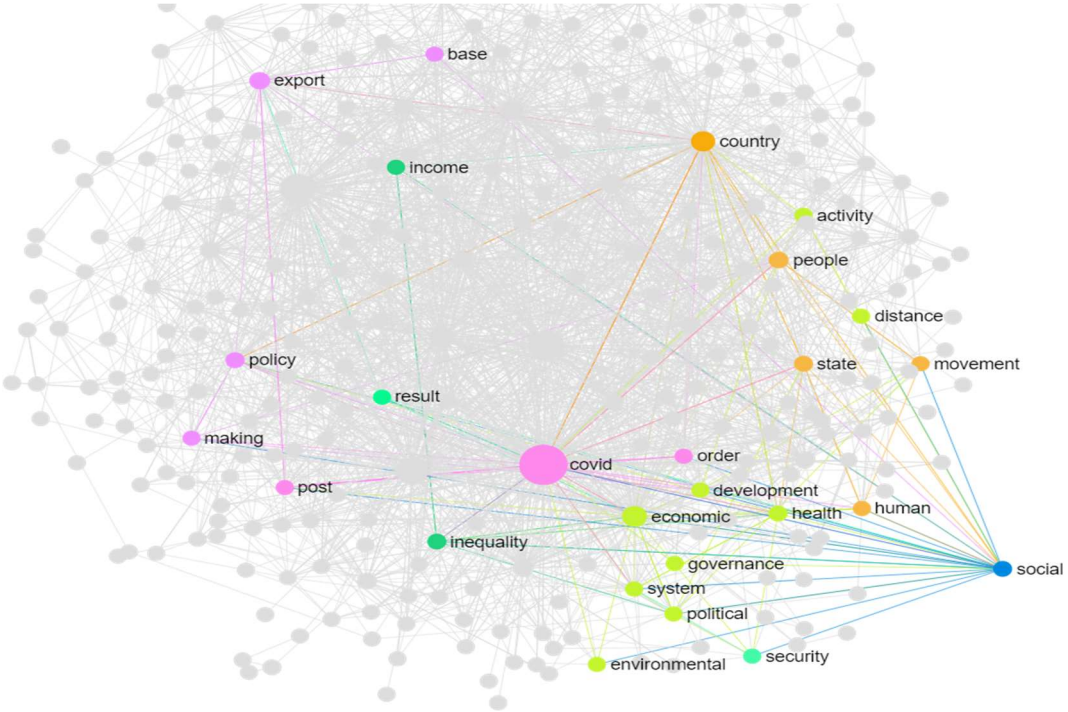

Figure 7.4 Text Network for the node- Social

Digitization helps new ways of performing existing business operations to be discovered (Sneader & Sternfels,2020). Without AI and machine learning, hospitals and labs cannot have the computational means to test patients or the capacity to search through volumes of data.

One of the most crucial contributions of globalization 3.0 phase is technologically advanced supply chain network (Baldwin and di Mauro (eds.), 2020). AI, IoT, 5G and blockchain-driven technological transformation has created a new global paradigm. The digital revolution is expected not only to increase productivity but also transformed the geopolitical and geo-economic structures.

7.3.3 Impact on the Environment

In slowing down the global breakdown and ecosystem degradation, COVID-19 has also been more successful than any of the world's policy efforts combined. By April 2020, global CO2 emissions fell by more than 17 percent. Over the next year, as a result of the downturn in economic activity, a decrease in greenhouse gas emissions higher than all the most ambitious modelers' estimates, is expected.

We must collectively support a green and resilient recovery. Prime Minister Narendra Modi said Indian economy has started seeing "green shoots" of recovery in June-July 2020 (Haider, 2020), and that it would play a leading role in global recovery. While addressing the India Global Week 2020 he welcomed global companies to establish their presence in India as we are reforming, performing and transforming.

7.3.4 Impact on Political Dimension

The global economy is heading to be the “Fortress Earth” where the power blocs around the world are hijacking on the freedom of individuals and shifting the economies towards authoritarianism, for instance, to avoid his trial for corruption, Netanyahu, Israel's Prime Minister, decided to shut down the courts in the country in time. The political intervention of the government in economic activities has shot up. Borders are turning into militarized zones. Politically, the pandemic would make the movements of nationalism, populism, xenophobism and racial or religious discrimination, much more hideous. Global rules may enhance national governance in some instances. People lost their jobs in the lockdown. Fraudsters capitalized on the fears and anxieties of the people. In need of money, the crime rate shot up, including kidnapping, robbery, snatching of phones, jeweler and cash.

7.3.5 Impact on geopolitics

Geopolitical trends that were already underway have upended. Sealed international boundaries do not limit global partnerships for any migration and a spurt of protectionism. It is necessary to uphold sustainable development priorities (Figure 7.5). Oguzlu (2020) is predisposed to the view that more extreme strategic rivalry among the great powers would be visible in the new world order. This raises the questions on the virtues of globalization. He anticipates slowdown of globalization across the world and acceleration of globalization at regional levels.

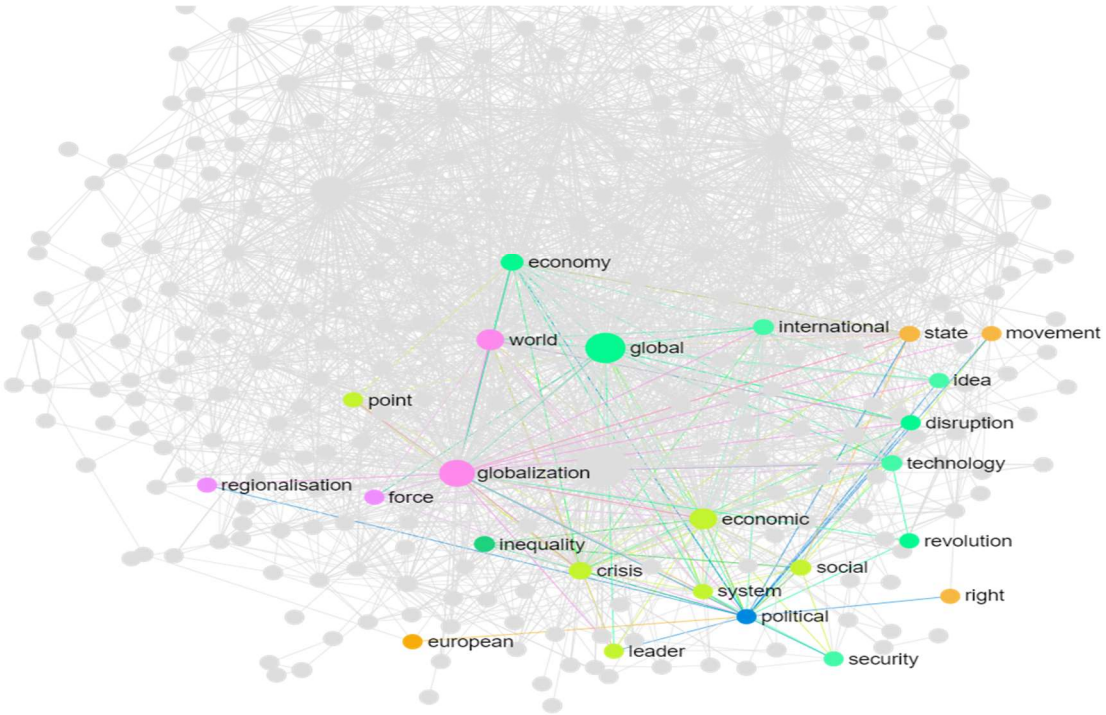

Figure 7.5 Text Network for the node- Political

Further de-coupling between the USA and China is reinforcing the notion of regionalization. Nevertheless, the geopolitical rivalry will not lead to the demise of globalization. To win against each other, they may indulge in more strategic and economic partnerships. China may have an advantageous play because of the pro-globalization stance it has been following since the past few decades (Kempe, 2020)

7.4 Geopolitics and geo-economics

Narayan (2020) suggests geopolitical conditions be worse than the geo-economics. While assessing the geopolitical landscape of the economies, questions which country shall lead in restarting international organizations, highlighting, that all the economies are struggling with some of the issues, While EU has internal problems, UK, in the post-Brexit era is facing difficulties too, West Asian and Russia are to face the challenges because of oil price meltdown. Researchers also believe that the Sino-centric move of China should be taken seriously. They target China for the negligence to alert the world about the pandemic in due time. China attempts being a White Swan from a black swan, that is, recovering from the pandemic before any other economy could revive and is now trying to position itself over the advantage of others. India, due to its economic situation, cannot offer global leadership.

7.5 Suggestive Initiatives

As the Covid-19 crisis exacerbates globalization worries, IMF economist, Gita Gopinath suggests that economies should work together and not to put export restrictions. She stresses on the argument that looking inwards may not be a fruitful strategy for growth and poverty alleviation around the world (IMF, 2020). Jonathan Fortun, an economist at the IIF, believes that “The COVID-19 shock has resulted in a pronounced sudden stop in capital flows to emerging markets.” To recuperate post-COVID-19, the policy approaches should require inflow of resources particularly FDI to help firms overcome supply-side constraints. This can be accomplished by the implementation of the quality management mechanism needed to access international firms' supply chains and by digital technology upgrades that enable firms to operate globally. This will eventually improve the competitiveness of local industrial structures. Secondly, EPZs regulations can be designed to attract FDI in EPZs and hence integrating them with foreign firms.

7.6 Policy Response Initiatives in India

COVID-19 dispels the belief that globalization would offer a solution to global issues (Figure 7.6). The policy responses have been majorly addressed by nation-states individually. Shri Narender Modi, Prime Minister of India, unveiled the "Atmanirbhar Bharat Abhiyan (Self-Reliant India)" with primary focus on "Vocal for Local to Global" infiltrating five foundations – "economy, infrastructure, technology-led system, demography and demand". The idea is to strengthen the grassroots to realize the potential macroeconomic vision. He announced an economic stimulus package of INR 20 Lakh Crore, equivalent to 10% of India's GDP, on May 12, 2020, to revive the Indian economy with a call for a "Self-Reliant India".

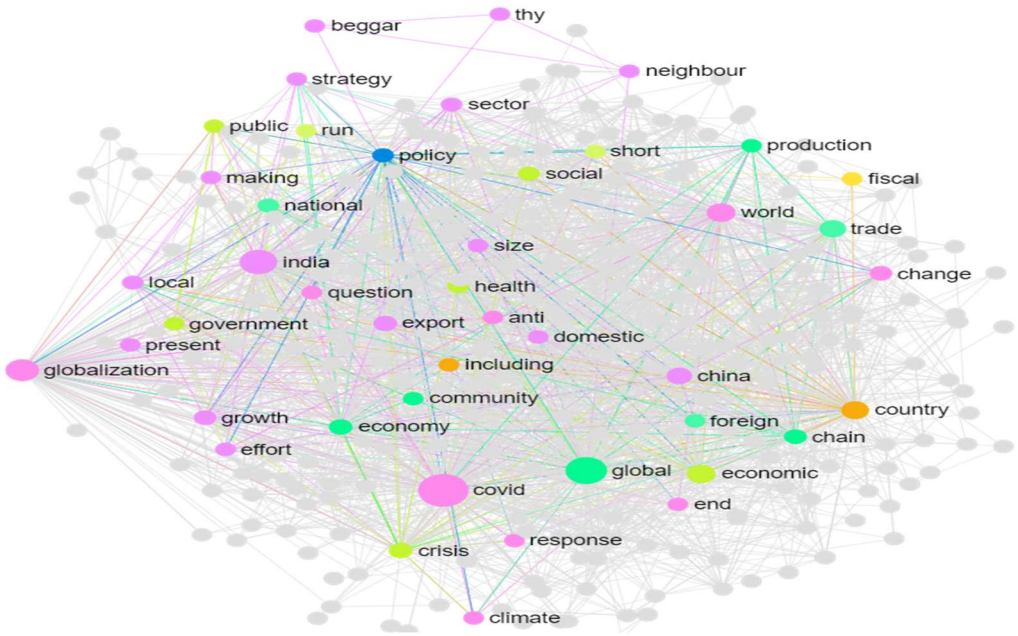

Figure 7.6 Text Network for the node- Policy

The stimulus package comprises five tranches. The first tranche of INR 5.94 lakh crore provides small enterprises with credit lines and funding for electricity distribution firms and shadow banks. The second tranche, totalling INR 3.1Lakh crore, contains two months of free food grain for stranded migrant workers and farmers' credit. The third tranche, totalling INR

1.5 Lakh Crore, comprises Agri-infrastructure investment and other agricultural and allied sector initiatives. The fourth and fifth tranches primarily deal with structural changes, including the easing of the defence sector's FDI cap, the privatisation of six additional airports, and the full opening of coal mining to the private sector. The INR 20 lakh crore fiscal stimulus with structural reforms will help achieve the vision. Under the “PM Garib Kalyan Anna Yojana" and "One Country One Ration Card", the Rs 1.7 lakh crore package would help 800 million marginalized Indians, by guaranteed ration, to sustain their nutritious intake rate. An amount of Rs 40,000 crore has been assigned to the "Mahatma Gandhi National Rural Job Guarantee Scheme” to offer free gas cylinders for three-months under the PM Ujjwala Yojna to 83 million BPL households, ex-gratia transfer of Rs 500 to 200 million “Jan Dhan accounts” for women, Rs 1,000 each for senior citizens and widows, and a deposit of Rs 2,000 each by direct benefit transfer to the accounts of over 80 million farmers. The predicted impact is twofold; first, temporary measures such as liquidity infusion and direct money transfers for the vulnerable will act as shock absorbers for those in acute crisis. (Saraswathi, 2020). Secondly, long-term reforms aim to make critical sectors globally competitive. These initiatives are expected to generate new growth opportunities in various economic sectors of the economy and help India regain in the global markets. (India.gov.in)

India ranks second in farm production globally. However, in the global food processing value chains, India ranks reasonably low. Drawing on to the comparative advantage, India can tap this potential gap by increasing the competitiveness in farm output. India can evolve to become the food factory for the world. The new proposed legislation enabling inter-state agricultural yield exchange would encourage farmers to access competitive rates and markets, moving to the target of the “One Country One Economy”. The recent amendment to the “Essential Commodities Act” would allow large-scale purchases of agricultural commodities by private actors. Also, stimulus worth $13 billion to develop farm-gate facilities would help increase

farm revenues and hence achieve the target of "self-sustainable villages". Such initiatives should be combined with a comprehensive digital network for trading.

7.7 Implications for India

IMF estimates the world economy to fall by 3% in 2020, the Euro area (-7.5%) and the US (-5.9%) are likely to be the worst-hit whereas it has estimated growth of 1.2% and 0.5% for China and India, respectively. India witnessed a steep fall in its composite IHS Markit PMI, to 7.2 in April, from 50.6 in March 2020. Manufacturing PMI declined from 51.8 to 27.4 and services from 49.3 to merely 5.4; whereas the during the same period, the composite PMI for France was 13.6, UK 13.8, Germany 17.4, Japan 25.8, Brazil 26.5, US 27%, and China 47.6%. This reveals that India was worst hit primarily due to its rigorous lockdown compared to other major economies (IMF, 2020).

As a result of demand and supply shocks and a pronounced downturn in exports, India's growth plummeted in Q2 2020 by 23.9 per cent y / y. The exports and IPI are contracted by 12.4 % y/y (Figure 7.7 and Figure 7.8 respectively) and the imports by 47.6 % y/y in June 2020 (Figure 7.9), leading to a surplus in the trade balance. India's trade balance recorded a surplus of USD 0.8 billion in June 2020, documenting the surplus after 18 years (Figure 7.10). This is attributed to the plummeting imports. According to the new UNCTAD World Investment Study 2020 on FDI, among the countries that earned maximum FDI inflows, India strengthened its position from 12th in 2018 to 9th in 2019. Amid the attempts of the incumbent government to draw more FDI, it is expected to decline dramatically in 2020 because of the effects of the coronavirus pandemic. In July 2020, both the smoothed and the actual CEIC Leading Indicator reflected a marginal improvement after two consecutive months remaining at the same amount suggesting the recovery of the economy (Figure 7.11). The pace of recovery is expected to

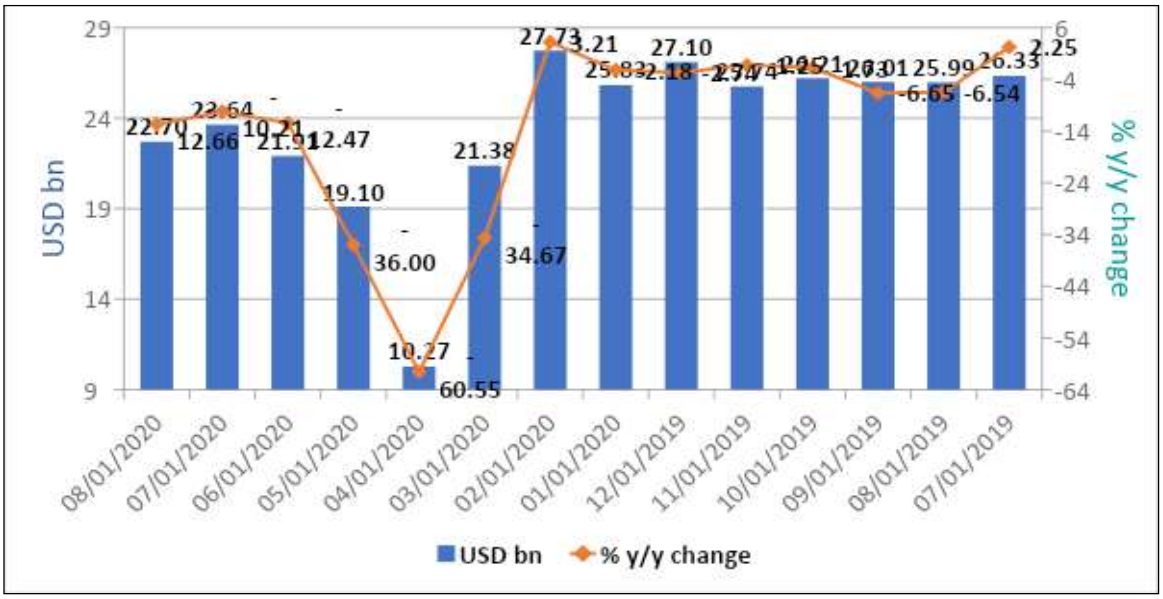

Figure 7.7 Exports

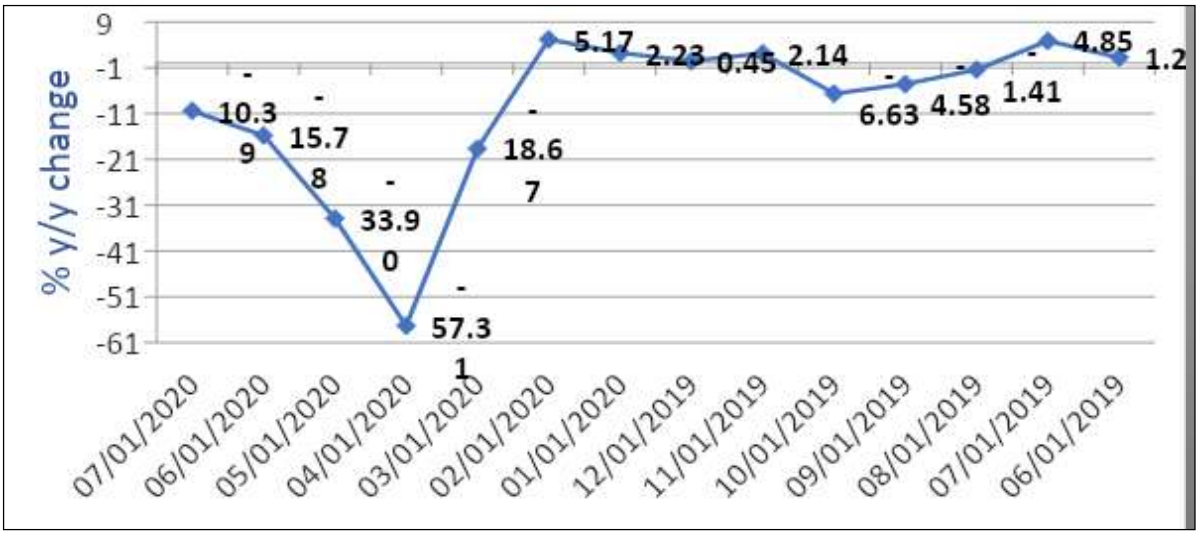

Figure 7.8 Industrial Production Index

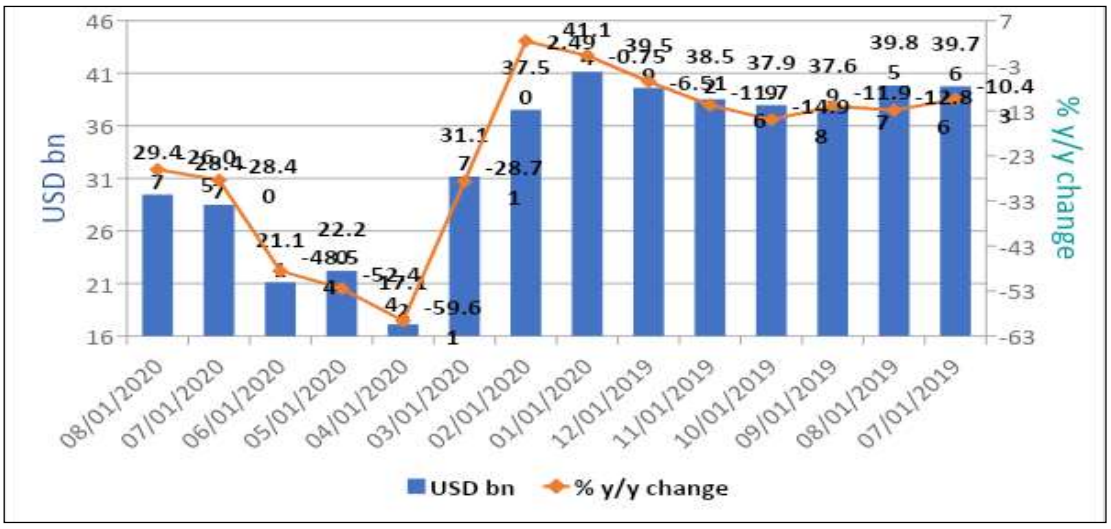

Figure 7.9 Imports

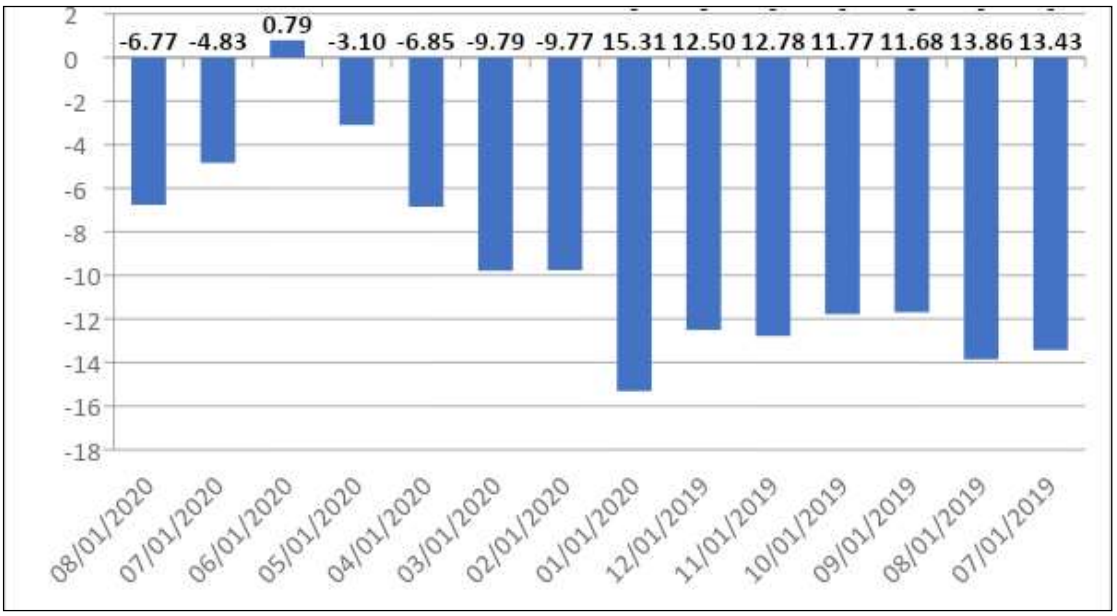

Figure 7.10 Trade Balance

Figure 7.11 CEIC Leading Indicator

falter from late Q3 2020, as the boost from the reopening of the economy fades, and the weakness of domestic and global demand reasserts itself (Figure 7.11).

Till March, the pandemic did not hit India too severely. It was the shut down in China that began creating troubles, especially in the procuring Active Pharmaceutical Ingredients (API). In contrast, Japan, and other western economies are prepping to shift the supply chains from China to India. The Prime Minister of India with NITI Ayog and Department of promotion of industry planned to accelerate the incentives for companies willing to move from China. Though as per August 2019 Nomura report, India was not a preferable option for companies planning to relocate due to various land and labour laws, bureaucracy, tax structure and other policy regulations. Majority of it owes to a relatively low quality of human and physical resources that are unable to attract foreign investments.

India's manufacturing sector was already performing low before the pandemic. Manufacturing's contribution to GDP dropped from 15.1 percent in 2014 to 14.8 percent in 2018, suggesting a failure of the strategy of Make in India. India cannot afford to split with China's associated East Asian value chains. FDI and foreign trade are very crucial for the recovery of the Indian economy. Global interdependence is the trend of the future, and with a reduced degree of democracy and control, national governments must handle their public policies. An intertwined and porous global system exposes the national infrastructure of a country's government to new vulnerabilities and external shocks.

In the times we are in, there are various polarizing opinions opting for isolationism. Advocating for reforms that would redistribute power to citizens the current policy structure for “Production Linked Incentive Scheme and Phased Manufacturing Programme" has begun to show results for the Indian economy as demonstrated by the interest of Apple and Medtronic for investment in India. During the COVID-19 crisis, India has been able to attract $ 38 billion of FDI (Krishnan and Dayasindhu, 2020). Palit (2020) mentions that Resilient Supply Chain Initiative (RSCI) is an example of how regional supply chains could reposition themselves in line with post-Covid-19 emerging geopolitics. India has a lot of opportunities for replacing Chinese items, and become Global Manufacturing Hub in Post-COVID World. The RSCI for developing resilient supply chains in the Indo-Pacific suggested by India, Japan and Australia has consequences for international trade agreements. There is a huge opportunity for India in the electronic segment, including the export base. Further, various manufacturing facilities have been sub-contracted to electronic companies in India.

In terms of the export of agricultural products, India has been a critical exporter of products such as rice, meat, milk products, tea, honey, and other organic products. The export of 21 such

agricultural products by taking advantage of trade restriction of the Chinese goods will be another opportunity for India.

The idea has been to turn local icons into global ones. Amul and ITC have exhibited manufacturing capabilities and enhanced business connexons. While ITC has invested in enriching the local Agri-value chains, Amul too has performed well. Tata, Hero, Bajaj and Mahindra are internationally known for cars, Fab India in garments, Forest Essentials in cosmetics and wellness are performing well in boosting the foreign representation.

One of the crucial approaches is to enable economies of scale in manufacturing with the development of infrastructure equipped land. Labour laws can be relaxed. In this direction, Uttar Pradesh and Madhya Pradesh have steadily repealed older labour legislations. Easing administrative milieu will help in attracting capital from both domestic and foreign sources. Further, using efficient infrastructure, urban and industrial hubs can be connected.

Kumar (2020) believe that introvert policies can be destructive, and India should follow “globalization and self-reliance". Narayanan, on the contrary, criticizes India's foreign policy to be much centered around the USA and suggest that India should strengthen its presence in South Asia and the revival of SAARC. However, this is possible only if India positions itself better than China. For the Indian economy, the primary goal and challenge are to maintain friendly ties with China. The two economies are integral economies to be side-lined. Keeping in mind the two important characteristics of the world economy in this pandemic, that is, the future of globalization and evolution of global governance and resilience, we need to formulate frameworks for a new kind of globalization capable of balancing the gain from opens markets and interdependence, and between autonomy and security of nations (Saraogi, 2020)

7.8 Lessons Learnt

The COVID-19 era is a wakeup call for international institutions, governments and the private players to shape the future of global trade. The crucial lessons learnt from the pandemic are:

There should not be excessive reliance on a particular country in GVC. The need is to widen and fragment the activities in a strategic manner. Even the large countries are vulnerable to supply chain disturbances owing to their reliance on other countries for source procurement. A possible solution to this may lie in 'glocalization'. As the Chief Economist at IMF, Gita Gopinath mentions “In future, these firms are likely to take greater account of tail risks, resulting in supply chains that are more local and robust—but less global". One can be sure that the GVCs are highly fragile and prone to disruptions. Domestic preparedness and the capacity to benefit from GVCs and ease of doing business shall contribute more to the development.

The pandemic enforces the need for international coordination, a collective leadership and setting up strong multilateral institutions in the future. There is no inequality between geographical borders or between nationalities, communities, ethnicities, castes and beliefs in the pandemic. All nations are dealing with the challenge in their manner. Sharing the best practices at this point would generate significant spill over results.

Striking a balance between globalization and self-reliance is very important. Regionalization can be that balance. If we look onto the west for potential globalization, we may forego the broader benefits and stability that we can achieve by strengthening the regional outlook. For the Indian economy, in particular, we should continue to chart the data of the whole economy in a transparent, reliable and comprehensive manner. A realistic approach towards the local production is needed, globalization cannot by a snap of fingers go straight out the window and neither should it.

Further, we need to encourage growth throughout the economy instead of trying to concentrate on one community or another, which dissipates resources and loses efficacy. A significant takeaway lies in the benefit of globalization. In India's future growth, financial capital and technologies and international expertise are of crucial importance. India should concentrate on combating the return of crony capitalism and preventing large firms from distorting markets in any field. It is unlikely for us to become an export powerhouse without imports.

7.9 Way forward

Venkatesh (2020) refers to this declining appetite for globalization, not as de-globalization but instead coined the term 'Akamaization' explaining it as a solution when firms remain global. As per him, Akamaization shall boost growth in two phases, one when the international firms modify their production chains due to the reversal of globalization exploiting the technological advancement, secondly when the firms develop their production process to be flexible and Akamaization friendly. Not only due to technological advancement, but Akamaization may also happen owing to geopolitical pressures. One of the limitations, as directed by the author, lies in the limited scope for export-led growth in an Akamaising world. Also setting up of manufacturing firms in a country should focus on sufficient market size and policies for cross border trade.

The decline of international travel is detrimental to the growth of the economy. Tourism adds more to global output than car manufacture. By April 2020, all economies had set international travel limits and 45 percent of countries had partly or completely closed their borders to foreign travellers. Airlines had 90% fewer international airline seats compared with 62% on domestic airlines. These downturns indeed call for further reform for the revival of the economy.

First, we need to advance reform and opening-up to a higher level and continue to optimize business environments. Second, we need to make great efforts to expand domestic demand, in turn, increasing people's willingness and ability to consume by increasing the income of the middle-income group. Third, we need to adjust the layout of the industrial chain and supply chain, and we need to speed up the digital upgrade. The export-oriented industrial chain should integrate with the new generation of information technology, such as digital transformation, core technology innovation, and business model innovation. Enterprises should actively adapt to the upgrading of both industry and consumption and satisfy consumers' expectations when it comes to products and service travellers.

Singh (2020) suggests that the weakening of the WTO is a strong indication that unilateralism, bilateralism and economic nationalism are overtaking multilateralism by rejigging India's trade policy. Moreover, the global trading order is being undermined by a more critical role of the state and the arming of trade policy to manifest economic and geopolitical objectives. With this context, in reviving trade, a thorough analysis of trade policy could be crucial. To strengthen the internal and external aspects, the trade policy system should be made more resilient and strategic. It is important to examine the reliance on imports for the supply of goods to identify the possibility of substituting imports through domestic production. Whatever India imports cannot be manufactured domestically, but for commodities of vital importance, self-sufficiency can be achieved. Supply-chains need to be stable and resilient to achieve this.

In India, SMEs are making a big contribution to work creation, exports, creativity and economic growth. SMEs contributes to 45% of industrial production, 40% of total exports and also make a significant contribution to GDP.

As the digital revolution has accelerated, the Covid crisis has turned into a veiled boon. With no other alternative available, e-commerce, e-services, etc., are proactively used by companies

to operate. The importance of digital commerce to the facilitation of the global value chain and to the production of creative goods cannot be undermined.

India has provided a comprehensive policy structure for the security and regulation of digital services and essential data privacy initiatives. In addition, emerging technology such as artificial intelligence, blockchain, etc. are increasingly influencing trade. The harmonization of e-commerce integration policies with a larger community of countries would also encourage trade. The Indian Neighborhood Regionalization Process should be practical and achievable. India needs to make sure that the Sustainable Development Goals (SDGs) do not remain an obscure term for achieving community regionalization goals. It is also imperative that the exploitative and hegemonic aspects of globalization are not strengthened in pursuit of geopolitical policies.

Mounting fiscal deficits are a result of policy reforms and responses initiated during a pandemic. This needs to deal with international collaborations. With the recession, slack in goods and labour markets, may signal severe price fall and indicate a growing risk of deflation. The role of monetary policy is crucial when a central bank tries to fight deflation.

Further, a broader digital disruption is expected to come up with accelerated automation. On the globalization front, the de-coupling on US and China would witness more protectionist policies from the world economies. The post-pandemic world will be marked by tighter restrictions on the movement of goods and services.

7.10 Globalization in post-pandemic

No one ever lived in such an interconnected and interdependent world before in human history, where economics has become the basis and source of national strength, rather than a by-product of geostrategic maneuvering. Though it shall be premature to gauge any trend in globalization

at this stage, an attempt is made to look at the changes in the trend of various components of dimensions of globalization in Elcano Global Presence Index and KoF Index of globalization. The changes in the parameters are recorded on year- on- year percentage basis on the nominal and absolute values. The data for the same has been collected from World Bank, UNCTAD, RBI reports, OECD database and CEIC database. Though there are a few limitations in tracing the data for certain aspects as they have either not been reported by the countries or is sensitive to register. The signs suggest whether the variable in context has shown an improvement (+) or degraded (-). The results indicate a mix of both positive and negative signs. The direction of the globalization indices will nevertheless be the weighted contribution of each dimension to the globalization index. Still, the positive sign is suggesting that globalization is not dying. It may slow down for some time or may change dominate through any of its dimension but will stay. (Table 7.1 and Table 7.2)

Though we are yet to examine whether the economic downturn would be a “V” or “U” curve (or even a possible “L” curve – recession followed by stagnation), or “K” recovery, there is a possibility that Indian recovery would be relatively faster than that of western countries which are more dependent on intricate financial markets.

Geopolitics explores the ideas and the determinants that will help form the current world order. Most of the prevailing discourse on strategic contestation focuses on distinctions of either having a world order dominated by China or transitioning to a US-led one. Regional attempts have been galvanized by the crisis in some places, such as the initiatives to resurrect SAARC.

The capitalist paradigm of economic globalization has undergone a severe reversal, will build more inward-looking national economies, a sharp contrast from the global society that was, until recently, the normal state of affairs. A new kind of 'gated globalization,' one which is less

accessible and less transparent than before, might emerge. This would not only influence mature economies but also developing economies (Rapoza, 2020)

Macroeconomic cycles are the indicators of the health of GDP in an economy and grow and shrink faster with GDP. What India needs at this juncture is a wider trade policy analysis for a rapid recovery in the midst of changing global trade policy dynamics. The fight to get over the extraordinary scenario emerging out of the Covid-19 pandemic continues everywhere. The supply chain policies will reshape the trade and investment flow in the economy. Sean Silverthorne (2020) believes consumers are the ultimate beneficiaries of free trade and international specialization enabled by GVCs. GVC encouraged cross-border collaboration and also provided a crucial catalyst in countless lower-income countries for sustainable development-boosting job growth and spurring poverty reduction. It encourages, under the broad umbrella of globalization, international companies, policymakers and multilateral organizations and regulators to come together. Hence, in the post-pandemic period, production networks shall become more diversified rather than clustered. Supply chain disruptions lead to production delays, but thanks to globalization, it enabled the availability of an array of near-substitutes, saving the halts in production. However, lockdown-led slack in demand did create a ripple in production volumes.

Technology considers the usage of advanced technology to combat the effects of the pandemic. Countries around the world have introduced mass surveillance software to trace, map, identify and diagnose new pathogens as they spread further, at the expense of privacy and data security. Technological developments in modern technology within nations have also prompted geopolitical contention. Owing to their deteriorating bilateral relations, the anticipated de-coupling between the US and China is expected to be more acute. New uncertainties will appear to threaten the current world order as technological and scientific developments proceed.

While these developments may make it seem as if de-globalization is progressing, a bird's eye view will show that the trajectory of globalization and growth has never run smoothly; instead, it is moving in stages. Within this context, we should reinterpret existing conflicts and obstacles as possibilities (Auerback and Frel,2020). By taking a systematic approach to understanding both internal and external consequences, market leaders will think productively about Covid-19, technology, and globalization. Internally, individuals exploit the resources provided by emerging technology, while handling systemic transformation sensitively to the increased pressures encountered by workers and teams. Externally, technical changes could theoretically lead to more globalization in some fields (Monteiro, 2020)

Subramanian and Chatterjee (2020) assert that export -led model of growth should not be abandoned. India has been an exemplar of export-led growth. India's export growth has been enormous over the last three decades, especially in the manufacturing sector, with a significant contribution to overall GDP growth. It is likely that today's export downturn would have a more important effect on the overall economy. Every five per cent of the export growth foregone will shave off one per cent in overall GDP growth. Export pessimism is focused on perceptions of overseas deglobalization and poor domestic results. But even in a de-globalizing world, India can gain market share. India's manufacturing exports account for 1.7% of the world's manufacturing, which is less than that of Vietnam.

In 2010s also, after the GFC, when world exports were stagnant, India’s exports of goods and services grew by 3 percent. The later decline in the exports was not an impact of the GFC but rather was majorly self-inflicted. It was exacerbated by a domestic anti-export policy that affected agricultural exports, including a sharp 20 percent exchange rate appreciation, reputational damage that undermined pharmaceutical exports and a social policy on livestock.

India can capitalize on the large unexploited opportunity of the unskilled labour exports and export of services. The post-GFC era witnessed de-globalization of world trade in goods but globalization continued apace in services. Most of the ideas of Atmanirbhar Bharat are related to the domestic market, which no doubt is huge and has a lot of potential to increase the growth but, where the need of the time is to set sights and policies on the world market.

As India contemplates atmanirbharta, export orientation has two deeper advantages. First, foreign demand will always be bigger than domestic demand for any country. Second, there is also a fundamental asymmetry: If domestic producers are competitive internationally, they will be competitive domestically and domestic consumers and firms will also benefit. The reverse is not true: Being competitive only domestically is no guarantee of efficiency and low cost. Pursuing rapid export growth in manufacturing and services should be an obsession with self-evident justification. The abandonment of export orientation would involve killing the goose that lays the golden eggs. It is now time for multinational companies to show their importance by using the best tools in the world to prevent the pandemic and promote recovery. Strangely, the COVID-19 pandemic has shown that globalization and self-reliance are both critical for the survival and development of a world. India has grasped this so well and is in a better position to bring it into strategies and initiatives than many other developing countries to withstand the pandemic's all-round attack. To sum up, too many pebbles have been tossed into the global pool, forming ever-widening loops, such as research, technology, business, media. Instead of worrying about diminishing rings, which means de-globalization, the need for the hour is to throw another pebble of global coordination and governance. It is established that globalization does not value the boundaries of a nation. We indeed are living in Marshall McLuhan's "global village". So even if globalization may deserve a reboot, there is no putting 'the globalization genie back in the bottle'.

Table 1: Variable of Elcano Presence Index			
VARIABLE	**% y/y change from June-July 2019 to June- July 2020**	**VARIABLE**	**% y/y change from June-July 2019 to June- July 2020**
Economic Presence		**Soft presence**	
Energy	+	Migration	-
Primary goods	+	Tourism	-
Manufactures	+	Sports	-
Services	-	Culture	+
Investments	+	Information	+
		Technology	+
Military presence		Science	+
Troops	Data not found	Education	+
Military equipment	Data not found	Development cooperation	+

Table 2: KoF Globalization Index restructured			
Economic Globalization, de facto	**% y/y change from June-July 2019 to June- July 2020**	***Economic Globalization, de Jure***	**% y/y change from June-July 2019 to June- July 2020**
Trade Globalization		*Trade Globalization*	
Trade in goods	+	Trade regulations	-
Trade in services	-	Trade taxes	-
Trade in partner diversity	-	Tariffs	+
		Trade agreements	+
Financial Globalization		*Financial Globalization*	
Foreign direct investment	+	Investment restrictions	+
Portfolio investment	+	Capital account openness	+
International debt	+	International investment agreements	+
International reserves	+		
International income payments	-		
Social Globalization, de facto		***Social Globalization, de facto***	
Interpersonal Globalization		*Interpersonal Globalization*	
International voice traffic	+	Telephone subscriptions	+
Transfers	-	Freedom to visit	+
International tourism	-	International airports	+
International students	-		
Migration	-		
Informational Globalization		*Informational Globalization*	
Used internet bandwidth	+	Television access	+
International patents	+	Internet access	+
High technology exports	-	Press freedom	+
Cultural Globalization		*Cultural Globalization*	
Trade in cultural goods	-	Gender parity	-
Trade in personal services	-	Human capital	+
International trademarks	+	Civil liberties	-
McDonald's restaurant	Data not found		
IKEA stores	+		
Political Globalization, de facto		***Political Globalization, de facto***	
Embassies	+	International organizations	+
UN peacekeeping missions	-	International treaties	+
International NGOs	Data not found		

CHAPTER 8 - CONCLUSION, RECOMMENDATIONS AND FUTURE SCOPE

It's been thirty years since India introduced privatization, globalization and liberalization reforms. The country has, since, integrated itself with the global world order. While the process of this integration has been slow and taxing, it has also helped India shield itself from the ill-effects of the worldwide recession that gripped the world in 2008. But with China growing its influence, India has no choice but to integrate itself more in the global economy or lose out to its counterpart as it establishes global dominance. This integration comes at a time when western countries are opposed to the gains of globalization and are putting up a fight against the rise of the Asian giants. They see the growing economies with suspicion, as they hold back from the economic order.

8.1 Conclusive statements from Objective 1

To assess the impact of globalization, an augmented KoF Globalization index is used. As VECM help determine the long-run and short-run analysis in a cogent manner, it is followed by granger causality and variance decomposition using impulse response functions. DOLS estimations with one lead and lag are employed to make stochastic error term free from all the previous deviations in stochastic regressors, which confirms the above result.

Although liberals have attributed the gains of today's world to trade, research studies on the topic have been inconclusive. Based on the results, short-run causality between growth, international trade and globalization have been established. Long-run causality between globalization and growth, however, has not been indicated. The cause-and-effect relation between trade has turned into a conundrum for researchers, as they are not able to establish if

the gains from liberalization were derived from higher growth or whether they were a reason for the growth of such economies. More so, when the developed economies are turning against the unfair advantage provided to the world on account of trade. The reversing of globalization, thus, has laid more emphasis on the theories of trade. As the world battles another recession, it becomes imperative to understand whether trade had anything to do with it. Because if it can cause slowdowns, it can certainly contribute to a boom.

8.2 *Conclusive Statement from* objective 2: To assess the impact of globalization on merchandise exports of India.

Post-1991, globalization has been the defining feature of the Indian economy. It took more than two decades of globalization to reach beyond South Asia, reaching East Asia and the Indo-Pacific region. We now have to explore the west. The conclusion transpiring from the approach aligns with the expectation that globalization impacts the exports positively. The results are in congruence with the study from Dreher and Gaston (2008). The economic size of the countries impacts exports positively, which De (2013), Bhattacharyya and Banerjee (2006), and Batra (2006) also support.

However, trade tensions in the global goods market always exist either due to crisis or due to inward-looking strategies. Integration of global economy via trade is expected to go a long way. Continental-sized markets are large enough to prosper, leading to a slower trade, and economies to remain regional. The globalization is indeed showing signs for slowbalization.

Linder hypothesis is validated that India trades more with the partners with a similar level of development and with the countries which are closer geographically. This has further managerial and policy implications. The results establish that the nature of globalization followed by the country has been regional, and India still needs to make an endeavour to make it global. Indian efforts for trade expansion can concentrate on countries with high trade

potential and a lower time of convergence, particularly the large trading partners like Hong Kong, Japan and Korea which are amongst the top 20 trading partners of India. Over recent years an uprise in the trade with various Sub-Sahara African countries extends the scope of further expansion in the region.

The study suggests a calibration of exports to the west from the east. That is an inclination towards convergence of exports in the developed nations. Structural transformation in the composition of export can help the economy boost fast (Balaguer and Cantavella, 2004). Although it is easy to establish that globalization has had an impact on exports in the Indian economy, its effect is limited, mainly owing to the narrow nature of our policy

8.3 Conclusive Statement from objective 3: To investigate the evidence of slowbalization for Indian economy.

This objective aims to gauge to what extent globalization has changed in nature. The pace of integration has slowed down over the past few years, and the shift towards going inwards, local and self-reliant is widely seen.

Many factors have contributed to this trend, like decreased trade, no further reduction in trade costs and the increased competitiveness of the domestic firms. In the face of profound structural changes, as in the case of the crisis-era, it is crucial to create a persistent empirical explanation of growth dynamics. In order to explain the growth in India, we estimated a time-varying parameter regression model that is capable of capturing time-varying properties of the growth process by its proximate determinants viz-a-viz the regular regression framework with same determinants. While both global and domestic factors have played a role in India's recent growth process, the role of domestic factors in sustaining the speed of growth is inevitable.

The study also has been able to justify the use of LEI to gauge the impact of globalization on economic growth. It captures the multi-domain development of economic activity. The empirical research reveals that the globalization effect is more focused on the economic channel of international integration since it showed increased foreign influence in the period of the Asian crisis and the GFC. Declining growth estimates during the Asian Crisis and the GFC originated as a shock outside the economy and impacted the growth of the economy. DHFM suggests the factor-induced domestic and foreign factors and the time-varying regression model suggests the changes in the macroeconomic dynamics and provide a flexible approach. The study reflects the deeper linkages with the regional blocs but the comparatively lesser impact of foreign factors in Slowbalization amongst the regions. In Central Asia and Europe (or region with less global component value), the integration seems to be more regional as they are less impacted by any changes in the global component. As global rules decay, a fluid patchwork of regional deals and spheres of influence is asserting control over trade and investment. Western consumers will continue to reap substantial net benefits from trade. In some cases, deeper integration will take place at a regional level than could have happened at a global one.

The paradoxical ideas of globalization and nationalism trap the governments and the organizations into newer problems as economies get more stringent in financing trade and the MNCs look for competitiveness in local enterprises. Further, this trend is intensified by the remarkable contribution of services in global economic activity. Since they are harder to trade cross border as compared to goods, companies are looking inwards. The trend shall reposition the global economy on new coordinates of efficiency and competitiveness. However, such periods of decreasing globalization have been traced earlier also. Still, the current situation might be a different one as the economies which were once the propagators of globalization are taking up protectionist policies. The European reprisal of their tariffs, the withdrawal of the

US from the Tran-Pacific Partnership, the introduction of tariffs on Mexico, China, the EU and Canada, and the US-China trade war play a role in the collapse of the golden age of globalization.

8.4 Conclusive Statement from objective 4: To estimate the time-varying dimensions of globalization

The two decades of globalization can indeed be called the golden period, new economies like India opened up sectors in a flurry to integrate with the global economy. However, even since the financial crisis, the pace of growth has slowed. Integration has seen a marked shift from global to 'glocal', which combines the effects of local with global. Many factors have contributed to this trend, like decreased trade, no further reduction in trade costs and the increased competitiveness of the domestic firms.

It is crucial to establish a persistent empirical validation of the growth dynamics, in the presence of profound structural changes. Unlike the conventional regression analysis and the standard SVAR model, we used TVP-R, and TVP-VAR estimates to elucidate the economic growth dynamics with its time-varying properties. In line with the suggestion proposed by Nakajima (2011), the study found TVP-Var model to be an efficient toolkit to explore the dynamics of the economy. We found the importance of both domestic and foreign factors in the growth, but the results suggest the role of domestic factors becomes inevitable to keep the pace of the growing up.

The study indicates a slower rate of growth of globalization in India. This situation represents, to a certain extent, an option for survival and not necessarily a plea for revisiting the age of economic protectionism. In short, there is no de-globalization process: the speed of globalization has slowed down, and its nature has changed. The study hence provides empirical evidence to the notion of slowbalization trend in India as suggested by The Economist (2019).

8.5 Limitations of the study

The study suffers from a few limitations mentioned below:

Geographical Constraint: The study is limited to the Indian economy

Time Limit and *Limited Data*

i. For the first and second objective, the time period is taken up to 2017 because of unavailability of data beyond 2017.
ii. Similarly, for examining the presence slowbalization, the time period starts from 1996 as the quarterly GDP data for the Indian economy is not available prior to that.
iii. For tracing slowbalization, data for only the top 21 trading partners are taken into consideration.

Other Limitations:

i. We have not examined the social and political perspective of integration in this study.
ii. One of the limitations of the second objective is to assess the dynamic and exponentially increasing role of services in global trade. The focus of the study is entirely on merchandise trade and does not represent trade in services.

Biases: We include a study of quantitative research techniques. Such approaches can generate outcomes and requires the interpretation of the definition by the researcher and how she takes it into account. As the econometric analysis is applied, it may be possible not to take into account all the themes that can be linked to the subject.

8.6 Discussion

The four decades after India's independence were mired by a policy of protectionism, leading to competing Asian economies gaining in terms of technology transfers from the developed world. While the 1991 reforms were expected to eke out a new path for development pushing India towards integration with the global economy, successive governments diluted the process over time by increasing tariffs and duties. The increased integration of the economy with the rest of the world made it more vulnerable to the shocks in the external world to impact the growth in Indian economy. India's growth crucially depends on its economic openness but off lately its contribution has been slowing down. Rather the disrupting changes in the foreign factors impact the domestic factors and hence impacts the growth of the economy. International trade too is highly connected to the economic globalization of the Indian economy. The 1991 crisis was a domestic crisis induced by global factors. If a slowdown in the international trade can hamper the growth of the Indian economy, a boom in the same shall spur growth. Increased protectionism and regulations hinder the growth of Indian economy. Increased import bills and a fervour towards protection of domestic industry has led to more trade restrictions being imposed. An analysis of data from Global Trade Alerts database shows that India ranks second after the US with respect to G20 economies between 2016-18 in terms of trade restrictions. After China, India also had the biggest target of trade restrictions amongst advanced economies. A report by the US in 2019 also indicated that India ranked second in the world in terms of import tariffs.

Global trade has collapsed dramatically with the tariff and non-tariff barriers since the Global Financial Crisis. Global trade hit 56 percent in 2016 from 60.8 percent of GDP in 2008 and began improving afterwards until the coronavirus pandemic gave it a severe blow. India has increased tariffs on 3,200 products since 2014, leading to an increase in average industrial tariffs from 13 percent to nearly 18 percent in 2019. In 2018, when there were almost 2,500

tariff increases attributable to almost 4 percentage points, the biggest increases took place. As a percentage of GDP, India's trade also decreased from its peak of 55.8 percent in 2011 to 40 percent in 2019, the sharpest decline coming after 2014 when it stood at 48.9%. India signed 11 preferential or free trade agreements (FTAs) between 2004 and 2014 under then-Prime Minister Manmohan Singh, while none after that A further decision to exit from the Regional Comprehensive Economic Partnership (RCEP), owing to demands of protection from the industry, made India a lesser opted choice for the foreign investors. In 2017, the number of anti-dumping initiations climbed to a peak of 360, almost double the number seen in 2011. The number of regional trade agreements, which continued to increase to a peak of 34 in 2008 following the Asian financial crisis in 1997-89, declined sharply to a modest 8-9 in 2017. The big picture is that it will be a protracted struggle to raise protectionism. The attempt by developed economies, led by the US, to reverse the shift of economic power from advanced countries to developing economies, particularly emerging Asia, is the structural catalyst behind the increasing support for protectionism.

This is so because most of the linkages are deepening regionally. The value chains in North America, Europe and Asia are sourcing more from nearby countries. Asia and Europe have exhibited trends of spurge in intra-regional trade since 2011. Asian organizations are reported to have more exports within the continent in 2017 (The Economist, 2019).

Data from the Global Trade Alert (GTA) database shows that India is only second behind US trade restrictions in the past three years. Competing economies like Vietnam, meanwhile, have signed FTAs with the EU. This disinclination of trade promotion policymakers is also reflected in India's decreasing share in global value chains. Atmanirbharta’s new policy is now another step in growing the primacy granted to domestic industries.

All economies are affected by such unilateral trade restrictions, and India is arguably more isolated than the decision to opt out of any one trade agreement. Such decisions even end up damaging the Indian industry. Tariff rises in one industry can hamper the other domestic industries too. Also, such tariff walls erode the long-term competitiveness of domestic firms and increase the 'cost' of entering into any trade agreement, such as the RCEP, as the gap remains large between the tariff rates of India and those of others. Such unilateral tariff walls eventually end up inviting retribution from trading partners. The GTA data shows that India has already faced a reaction from the G-20 economies.

In the post-liberalization era, India's export growth and overall GDP growth rate have been much higher than it was during the protectionism era. Higher protectionism does not seem to have given the country any substantial benefits, although greater integration has helped the economy as a whole. Only if it opens up its economy and adopts fair and predictable policies, it can realize its ambitions to become the world's next factory. Instead of pressuring domestic firms across industries to become globally competitive, India's policymakers must refuse to give in to protectionist lobbies for rapid expansion of Indian economy. Eastern world is much more dynamic than the western markets, which are mostly flat with increased protectionism. We need to access the Asian markets in such a situation. RCEP is an important initiative in that sense. This gives us an opportunity to merge the Indian economy and development with the countries of East Asia. India is much more integrated with the rest of the world now. Therefore, what happens in the global economy would have a direct impact on the economy of India.

8.7 Implications of the study

i. The present study enriches the existing literature by including qualitative analysis interspersed with quantitative analysis for re-examining the dynamics of globalization, economic growth and international trade for the Indian economy.

ii. This study highlights the significant trade potential of the Indian economy.

iii. This study bridges the gap and highlights the globalization effect on the Indian economy.

iv. The present research study confirms empirically the evidences of slowbalization for India.

v. This study is significant for the policymakers as it highlights the gaps between the understanding of the current situation, policies created and the execution of these policies.

vi. This study enhances the knowledge of the exporters, importers and managers who would now be able to identify different markets with great potential.

8.8 Recommendation from the study

i. After the success of the Look East and Act East policy, the study suggests a reorientation towards the west to harvest the untapped potential with the western economies also. Despite the signs of slowbalization, stepping back will, in no way, benefit the economy.

ii. The results suggest trade agreements to be of high significance for promoting export from India and hence RTAs can be routed for the trading partners with high trade potential from Latin American and the Caribbean region like Guatemala, Bolivia, Cuba and Costa Rica to name a few. FTAs with US, EU and emerging pan-African FTA can be a boost to the exports volume framing the path to access such opportunities.

iii. The study recommends the adoption of a strong export-promotion approach. The need is to align exports with the changing import patterns of the global economy and increase

the competitiveness of Indian products in the global markets.

iv. The employment-intensive sectors can be pushed in exports to increase the exports from technology-driven sectors. It's imperative to understand the increasing contribution of the Information and Communication Technology sector and other services as they are changing the shape of the trade dynamics. Even in the case of goods, there is a need to recreate the taxonomy of trade based on new portals like Amazon and Alibaba, which acquired an increasing role in the trade of goods, and the modicum of trade needs to be reviewed with reference to e-commerce giants.

v. The policy should be focussed on the markets with complementary opportunities. More important, to align with the globalized world, India has to follow a model that has been best exemplified by economies like Vietnam and China, to portray themselves as an invaluable part of the world trade. There are great variations in economic growth due to free trade and globalization and a constant re-examination of the trade dynamics is always required. Weiermair and Supapol (1993) suggest that firms and economies shall adapt themselves through constant technological, organizational and product adaptations.

8.9 Future scope of the study

i. The future research focus is directed to the study of trade of services and the participation in production networks, which may change the dynamics of trade concerning the speed of globalization in the near future.

ii. Social and Political factors integration can be considered for further understanding of the phenomenon.

iii. The impact of globalization can also be seen on the Global Value chains of the economy.

iv. Number of trading partners as chosen to find the traces of slowbalization can be increased.

v. There is a need for continual research in the said area as the winds are changing, globalization is shifting to slowbalization, and it will further create more difficulties, especially for emerging economies. When the individual countries try to manifest local solutions to global shocks, this lobal shocks, this further digs towards slower globalization.

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LIST OF PUBLICATIONS

Journal Publications

1. Gupta, S., & Kumar, N. (2020). Three decades of narrow globalization: Evaluating India's exports between 1991 and 2017. *Managerial and Decision Economics*. (Indexed in SSCI, SCOPUS listed B in ABDC).
2. Gupta, S., & Kumar, N. (2020). Time varying dynamics of globalization effect in India. *Portuguese Economic Journal*, 1-17. (Indexed in SSCI, SCOPUS listed C in ABDC).
3. Gupta, S., & Kumar, N. (2019). Globalization, trade and growth dynamics: An empirical investigation for the Indian economy. *Indian Journal of Economics & Business*, Vol.18, No.2. (Indexed in SCOPUS and listed in C ABDC)

Journal Publications (Accepted)

1. Gupta, S., & Kumar, N. (2019). Imperatives of Creative Destruction: A relook at Globalization-Growth-Innovation nexus for the Indian Economy" accepted for publication in International Journal of Business and Globalisation (Indexed in SCOPUS and listed in C ABDC)
2. Gupta, S., & Kumar, N. (2019). Has globalization reaped rewards? A fresh perspective from India" accepted for publication in International Journal of Information & Decision Sciences, (Indexed in SCOPUS)

International/ National Conference Publications

1. Impact of Components of Globalization on the economic growth of India: An Empirical Study. GLOGIFT 17, International Conference, Delhi Technological University, Delhi on 11-13 December, 2017. (Published in Proceedings).
2. Impact of Globalization on the economic growth of India. International Conference on Advanced Production and Industrial Engineering, Delhi Technological University, Delhi on 6-7 October, 2017. (Published in Proceedings)
3. Financial crisis 2007-10: A study of key drivers and the lessons learnt from Indian Economy. International Conference on Advanced Production and Industrial Engineering, Delhi Technological University, Delhi on 9-10 December, 2016. (Published in Proceedings)
4. Global Value Chain's impact on employment in developing economies: The impact of second wave of GVC integration on India. 61st Annual Conference of ISLE, Organized by Punjabi University, Patiala, Punjab, on 7-9 December, 2019. (Extended Abstract Published)
5. Imperatives of Creative Destruction: A relook at Globalization-Growth-Innovation nexus for the Indian Economy. International Conference on Business and Management, Organized by Delhi School of Management, DTU on 29-30 March, 2019. (Abstract Published)
6. Global financial crisis and its impact on India's foreign trade. International Conf. on Financial Markets and Corporate Finance (ICFMCF-2017), Vinod Gupta School of Management, Indian Institute of Technology, Kharagpur during 7-8 July 2017.
7. Measuring the measures of globalization: A review. ICARI'19. (Paper Presentation)
8. Recent Trends in Globalization: Evidences from India. ICARI ,18. (Paper Presentation)

Workshops and Faculty Development Programmes attended

1. One-week Online Workshop on Panel Data Analysis, organized during 17-22 August, 2020, Department of Humanities, Delhi Technological University, Delhi.
2. Time Series & Panel Data Analysis (Sharpening Skills in Statistical Data Analysis for Research) during 20 July- 26 July, 2020, organized by Teaching Learning Centre, Ramanujan College, University of Delhi and MHRD Sponsored PMMMNMTT.
3. One-Week Faculty Development Programme on Advanced Topics in Macroeconomic Theory and Policy, organized during 6-14 March, 2020, Department of Business Economics, South Campus, University of Delhi in Collaboration with Teaching Learning Centre, Ramanujan College, University of Delhi.
4. One-week Workshop on R and Econometric Tools, organized during 5-9 March, 2019, Department of Humanities, Delhi Technological University, Delhi.
5. Econometric Techniques: Panel Data and Time Series Analysis, organized during 3-8 December, 2018, VIPS, Delhi.
6. E-Resources: A Gateway for Research, organized during 10-14 Sep, 2018 Delhi Technological University, Delhi.
7. Panel Data Analysis organized during 16-18 July, 2018 at RDIAS, IPU