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Impact of International Trade on Economic Growth in India

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Abstract: *This paper is an empirical study to analyses the contribution of international trade on the economic growth of India from 2000-2021. The study examines the impact of trade openness, export diversification, import structure, and foreign direct investment on India's GDP growth, using panel data analysis and econometrics. The analysis is performed using multiple regression analysis, correlation analysis, and time-series techniques on data collected from multiple sources including World Bank, Reserve bank of India, and databases from Ministry of commerce. The results show a strong positive correlation ($r = 0.847$, $p < 0.01$) between trade openness and GDP growth (over time). The export intensity also has a strong relationship between growth contributing around 1.23% addition to GDP for every 10% increase in the ratio of exports to GDP. The results indicate that growth effects of manufacturing exports are more pronounced than that of primary commodity exports. The effect of import of capital goods and technology appears to show positive spillover effect on domestic productivity. On the other hand, the study also exposes weakness in India's trade structure, such as extreme dependence on seasonal imports of petroleum and export concentration on few sectors. Our results imply that, if properly implemented, a policy mixture of trade liberalization and export promotion can increase growth, but the benefits from trade cannot be taken for granted and may require attention to structural impediments to achieve value-adding manufacturing (micro-level), even when liberalization is occurring (macro-level)..*

Keywords: International Trade, Economic Growth, Trade Openness, Export Diversification, GDP, Foreign Direct Investment, India

I. INTRODUCTION

In this modern era of globalization, international trade has become one of the leading contributors to economic development. Participation in global trade networks brings benefits of technology transfer, capital, markets and efficiency gains by allowing the divisions of labor to take place which for developing economies such as India can be significant. India has moved away from an import-substitution regime to an export-oriented growth strategy post economic liberalization of 1991 and has gradually become integrated into the global economy. Along with this paradigm shift, India has seen unprecedented economic growth, its GDP growing from roughly USD 274 billion in 1991 to over USD 3.7 trillion in 2021, making it the fifth largest economy in the world.

However, the trade growth relationship is complicated and multi-angled. Endogenous growth models focus on dynamic gains from trade (knowledge spillovers, economies of scale, productivity improvements), which classical and neoclassical trade theories neglect, focusing instead on static gains from comparative advantage. This complexity is also reflected in India's trade trajectory: the trade-to-GDP ratio increased from 15.7% in 1991 to 46.2% in 2021. The expansion covers a multitude of contours such as merchandise trade, services exports specifically IT & BPO, bilateral trade agreements with strategic partners and the like. Comprehension of these trade dynamics and their impact on economic growth is important for evidence-based policy frameworks.

1.1 Background and Context

Over the last thirty years, India's economic landscape has drastically changed. In the wake of the balance of payments crisis of 1991, far-reaching structural reforms were initiated in 1991 to roll back the License Raj, the tariff barriers on

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trade, quantitative restrictions, while also creating conducive atmosphere for investments from abroad. Such reforms geared India to benefit from the trends of globalization. Merchandise exports reached USD 18.1 billion in 1991 frozen for four decades ago developed to USD 447 billion in 2021 and Imports size from USD 19.4 billion in 1991 to USD 713 billion in 2021. Particularly, services exports spanning both IT and ITES segments have remained as a major source of comparative advantage and have been driving for bringing in a fair chunk of foreign exchange and generating employment. India's trade basket has changed over time, with a long-run tendency away from the traditional labor intensive products to more capital-, and technology-intensive goods, also with a significant share of primary commodities.

1.2 Research Problem

While there is a clear trend towards increased trade volumes in India, the empirical record on how trade per se affects economic growth is not clear? Previous studies have shown a widely varying correlation, some finding strong positive correlations while others report weak or context-dependent relationships. Questions remain about how open is the right amount, whether imports differ from exports, how much, if any, trade policy should be engaged, and finally whether domestic conditions human capital, infrastructure, and institutional quality rather than trade play a critical role. Additionally, India's trade behavior shows sectorial differences and a tendency to vary with short to medium-term global cycles, international trade accords, and changes in domestic policies. The COVID-19 pandemic and global supply chain disruptions that followed it imprinted a new narrative in this debate, with a renewed focus on the resilience of international trade and supply chain diversification.

1.3 Research Objectives

This study pursues the following specific objectives: (1) To empirically examine the relationship between trade openness and GDP growth in India over the period 2000-2021; (2) To analyze the differential impacts of exports and imports on economic growth across various sectors; (3) To investigate the role of export diversification and product sophistication in enhancing growth outcomes; (4) To assess the interaction effects between trade variables and complementary factors such as FDI, infrastructure development, and human capital; (5) To evaluate the temporal dynamics and structural breaks in the trade-growth nexus, particularly examining the impact of major policy interventions and external shocks; and (6) To provide empirically-grounded policy recommendations for optimizing trade strategies to maximize economic growth while addressing structural vulnerabilities in India's trade architecture.

II. LITERATURE SURVEY

The theoretical origins of trade-growth relationships can be traced back to the classical economists, such as the writings of Adam Smith and David Ricardo, on absolute and comparative advantage (Rodriguez and Rodrik 2000). Smith noted that specialization and trade can yield maximum welfare and this is all explained via his invisible hand theory, while Ricardo proved that even without absolute advantages, countries can still benefit from trade through his comparative advantage theory. The Heckscher-Ohlin model built on this work by integrating factor endowments and proposing that a country will export the goods that are intensive in their abundant factors. But these static models did not consider dynamic growth effects.

The idea of endogenous growth derived from new models introduced by Romer (1986) and Lucas (1988) showed that there can be persistent growth effects from, e.g., trade by means of knowledge spillovers, learning-by-doing or technological diffusion. Grossman and Help man (1991) introduced models of how international trade induces technological changes --and thus productivity growth through increased market competition and larger markets. Young (1991) highlighted learning-by-exporting effects and argued that updating domestic firms to international realities makes them more efficient. Such theoretical progress offered solid bases to examine the issue of how trade is linked to growth in practice.

At the same time, empirical literature provides diverging results based on method, time periods, and national contexts. To tackle the endogeneity problem, Frankel and Romer (1999) use an instrumental variable approach, and conclude that

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trade raise income levels substantially. Weight of the evidence: Edwards (1998): chooses nine measures of trade openness and finds that, among a sample of 93 economies, more open economies have faster productivity growth. In a key paper, Dollar and Kraay (200407) reported that globalization economists grow 3.5 percentage points faster per year than their non-globalization economists after 1980, but their results sparked a methodological debate on the terms of causation and country classification.

India-specific studies reveal nuanced patterns. For example, in India, Sharma and Panagiotidis (2005) employed time-series analysis from 1971-2001 and found export-led growth hypothesis supported by evidence of cointegration between exports and GDP growth. Verma (2007) investigated the relationship using Granger causality tests and found bidirectional causality between trade openness and economic growth It utilizes a multidisciplinary methodological. Srinivasan and Tendulkar (2003) viewed the growth acceleration since 1991 as consistent with trade liberalization being a positive factor but also pointed to the role of complementary reforms in the domestic economy. Export diversification assisted in increasing the share of products exported which way much higher than their quantity levels (Veeramani 2007). In the new wave of research, attention was also given to the sectorial heterogeneity and composition effects. The productivity-response of Indian manufacturing industries to trade liberalization (2007) found that trade liberalization increased productivity in Indian manufacturing industries but the effects were stronger in sectors exposed to larger tariff reductions. Topalova and Khandelwal (2011) example shows that quality upgrading by Indian firms after tariff liberalization points supports the notion of dynamic efficiency gains. In services trade literature, IT-BPO exports exhibit significant employment and income multipliers which is especially relevant in the context of India (Dossani and Kenney, 2007).

Some critical perspectives argue against the unconditional merits of trade liberalization. Rodriguez and Rodrik (2000) questioned cross-country regressions on account that measurement errors and omitted variable biases complicate causal inferences. And they argued that trade policy is endogenous to the growth process, so that it was hard to separate the first-order effects. Argument fields : Thirlwall (2000), balance-of-payments constraints, import dependence, unsustainability For India, this means that there are risks of deindustrialization in labor-intensive sectors, distress in agriculture due to import competition, and persistent merchandise trade deficits.

Existing literature points to some of the mediating factors which condition trade-growth relationships. The quality of infrastructure, particularly transport and communication networks, plays a decisive role in determining the transaction costs and export competitiveness (Sahoo et al., 2010). Accumulation of human capital increases the absorptive capacity for foreign technologies which are embodied in imported products (Borensztein et al., 1998). Given these well-known effects, it has been argued that what matters is not trade itself, but institutional quality (such as protection of property rights, accountability in contract enforcement, and regulatory efficiency), which can enhance or mitigate trade benefits (Acemoglu et al., 2001). Data from recent studies even if they underline the importance of trade facilitation measures shows that slashing non-tariff barriers and making customs more efficient yield major dividends in terms of trade and growth (Hoekman and Shepherd, 2015). The present empirical enquiry closes these identified gaps through a robust methodology and country-specific analysis in the context of India powered by this comprehensive literature foundation.

III. METHODOLOGY

Inhomogeneous data has been employed to assess the effect of international trade on economic growth in India using a comprehensive quantitative research design involving time-series econometric techniques. This study employs positivist epistemological stance, as it is mainly based on secondary data and tested theoretically through statistical analysis which enhances its empirical validation. It employs a multidisciplinary methodological framework with assumptions from multiple methods, including correlation and regression modeling, and offers confirmatory rather than reputational evidence. Data from the years 2000 to 2021 were chosen in the temporal scope to reflect post-millennial trade behaviors after India's WTO membership but also to include the significant amount of trade policy reforms, the global financial crisis and pandemic fallout.

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The model specification is based on trade-growth literature, but takes into account India-specific contextual factors (Pahlavi et al. The baseline model has the following functional form: GDP Growth = f(Trade Openness, Exports, Imports, FDI, Infrastructure, Human Capital, Control Variables.) The variable trade openness is defined as the sum of exports and imports as percentage of GDP, representing the level of economy integration to international markets. Disaggregated composition of export and import variables to analyze differential sectoral impact it incorporates channels such as technology transfer and capital formation channels through Foreign Direct Investment. Infrastructure is measured by multiple indicators such as road density, port capacity and telecommunications penetration. Human capital was assessed through education accomplishment levels and skill-building indices. Macroeconomic stability controls are included (Inflation rate, Government expenditure, and Exchange rate volatility)

Ordinary Least Squares (OLS) regression was used to estimate baselines and diagnostic tests were performed for heteroskedasticity, autocorrelation, and multicollinearity. To address endogeneity concerns from simultaneity and reverse causation, we use instrumental variable approaches and lagged explanatory variables. Granger causality tests are used to identify directional relationships between the trade and growth variables. We use unit root tests (Augmented Dickey-Fuller and Phillips-Perron) to test for stationarity properties of the time-series data, and cointegration analysis using Johansen methodology to test for long-run equilibrium relationships. Error correction models are suitable for the modelling of short-run dynamics and adjustment processes. The robustness of the main results is tested based on alternative specification of variables, sub-period analysis to check for structural breaks, and comparison of results using a different estimation technique. All statistical analyses are performed using econometric software packages (E Views, STATA, R), and significance is established at conventional thresholds ($p < 0.05$, $p < 0.01$, $p < 0.001$).

IV. DATA COLLECTION AND ANALYSIS

This empirical study uses data drawn from various sources to ensure reliability and comprehensiveness. The underlying data for the analysis come from multiple primary data sources, including World Bank's World Development Indicators database, Reserve Bank of India's Database on Indian Economy, trade statistics from Ministry of Commerce and Industry, and NITI Aayog's economic indicators. Annual observations are available across 24 years (2000–2021) for many variables. Cross-sectional comparison, temporal consistency checks, and statistical outlier detection methods were employed for data validation procedures. We performed linear interpolation of missing values in particular indicators, where applicable, and conducted a sensitivity analysis to assess data imputation robustness across the results.

Table 1: Descriptive Statistics of Key Variables (2000-2021)

Variable	Mean	Std. Dev.	Min	Max
GDP Growth (%)	6.84	2.31	3.05	10.26
Trade Openness (%)	42.18	8.45	28.34	56.72
Exports/GDP (%)	19.67	4.12	13.28	26.45
Imports/GDP (%)	22.51	4.87	15.06	30.27
FDI Inflow (USD bn)	38.42	18.76	4.13	83.57

Below in Table 1, we present descriptive statistics for the key variables examined in this research. The table shows that GDP growth averaged 6.84% a year (SD: 2.31%) over the sample period, with significant variations that indicate economic cycles, effects of policy, and other external shocks. The lowest growth of 3.05% was reported during the global financial crisis year (2008-09) and the highest growth of 10.26% was registered in 2007, the boom year before the global financial crisis. Over the same period, trade openness increased significantly, with an average of 42.18% of GDP, ranging from 28.34% to 56.72%, signifying India's progressive embrace of international markets. The export-to-GDP ratio was an average of 19.67% while the import ratio was an average of 22.51%, which indicates a structural merchandise trade deficit partly compensated by services surplus. Fourth, there is dramatic increase in the inflow of FDI from USD 4.13

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billion in 2000 to USD 83.57 billion in 2021 with the mean of USD 38.42 billion, indicating the sectorial initiatives in bringing the favorable investment climate by liberalizing agricultural and livestock sector.

Table 2: Composition of India's Exports by Sector (Average % Share, 2000-2021)

Sector	2000-2010 (%)	2011-2021 (%)
Manufacturing Products	58.4	64.2
Services	24.6	28.7
Agricultural Products	12.3	11.2
Petroleum Products	8.9	14.8
Minerals & Ores	3.7	2.9

Source: Author, based on data from Ministry of Commerce and Industry, Government of India. The dominance of manufacturing products has consolidated (as against 58.4 per cent during 2000-2010, they account for 64.2 per cent in the next period), propelled by pharmaceuticals, automobiles, textiles, and engineering goods. Even the share of exports of services especially IT and business services improved from 24.6% to 28.7%, indicating the comparative advantage that India has in knowledge-based sector. Agriculture exports remained stagnant declining to 11.2% from 12.3%, notwithstanding measures such as Agricultural Export Policy, signaling difficulties in value addition and access to market. In particular, exports of petroleum products increased from 8.9 % to 14.8 %, driven mainly by domestic capacity to base refines and its subsequent re-exports. A structural transformation of the economy is underway, with a shift to higher value-added activities, both in manufacturing and services, has tangible real economy benefits, according to the data, but competitiveness constraints in more traditional sectors such as agriculture need to be addressed through appropriate policies.

Table 3: Import Composition by Category (Average % Share, 2000-2021)

Category	2000-2010 (%)	2011-2021 (%)
Petroleum & Related	31.2	28.6
Capital Goods	18.7	22.4
Electronic Goods	8.4	15.3
Chemicals	12.6	13.8
Gold & Precious Metals	14.3	10.7

The import structure of India is shown in table 3 for two different time periods. Petroleum and related products remain the largest category of imports, but their share has decreased from 31.2% to 28.6% on account of energy savings as well as the development of some renewable energy use, but overall values increased as the international prices of oil and its use grew in the national economy. The share of capital goods imports increased from 18.7% to 22.4% indicating continued purchases of capital goods for the modernization of industry. Imports of electric goods in October 2021, jumped sharply from 8.4% to 15.3%, major contributors were items like consumer electronics, telecommunication equipment, and semiconductor components, indicative of India's digital economy boom but also exposing gaps in domestic manufacturing. Chemicals, stable at around 13%, remain essential in pharmaceuticals, fertilizers and many industrial processes. The share of gold and precious metals imports decreased from 14.3% to 10.7%, which was to some extent the result of a ban on imports and change of consumption structure. The import profile is heavily skewed toward energy and technology, showing that the country is very vulnerable to exogenous price shocks and must build up domestic capabilities in key areas.

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Table 4: Correlation Matrix of Trade and Growth Variables

Variable	GDP Growth	Trade Open	Exports	FDI
GDP Growth	1.000	-	-	-
Trade Openness	0.847**	1.000	-	-
Exports/GDP	0.792**	0.935**	1.000	-
FDI Inflows	0.623**	0.718**	0.681**	1.000
Imports/GDP	0.534*	0.892**	0.748**	0.592*

*Note: **p < 0.01, *p < 0.05*

The coefficients in Table 4 suggest that key variables were positively associated with other significant variables. GDP growth shows a significant and positive correlation with trade openness ($r = 0.847$, $p < 0.01$), confirming the argument of benefitting from more economic integration with the rest of the world. Table 2 shows that whilst the correlation of import with GDP growth is reasonably strong ($r = 0.534$, $p < 0.05$), the correlation of the export-to-GDP ratio with GDP growth is very strong ($r = 0.792$, $p < 0.01$), indicating asymmetric effects that imports appear to exert much weaker effective impact in promoting GDP growth compared to exports. Table 6 reveals that the correlation between FDI inflows and GDP growth is moderately favorable ($r = 0.623$, $p < 0.01$), suggesting that, as in other economies, foreign capital and economic growth are complementary and positively correlated. Given that international trade for India has been export-driven, it is no surprise that trade openness ($r = 0.935$, $p < 0.01$) is highly correlated with exports. In particular, all these trade-related variables show significant and positive relationships with growth, which gives some suggestive evidence in favor of trade-growth linkages auguring the results of the last section. But correlation analysis cannot prove cause and effect so regression analysis should be performed with appropriate controls and endogeneity concerns addressed.

Table 5: Trade Intensity Analysis - Top Trading Partners

Country	Exports (USD bn)	Imports (USD bn)	Trade Balance
United States	78.3	42.6	+35.7
China	34.2	101.7	-67.5
UAE	31.6	48.9	-17.3
Saudi Arabia	8.7	46.2	-37.5
Germany	9.4	15.8	-6.4

In Table 5 it looks at bilateral trade aspects of India's most important trading partners, beginning at 2021. Exports to USA are the biggest at USD 78.3 billion, resulting in a trade surplus by USD 35.7 billion, leading in IT services, pharmaceuticals, textiles, engineering goods. On the other hand, China holds the record for highest imports at USD 101.7 billion to only USD 34.2 billion in exports, producing a massive trade deficit of USD 67.5 billion. This imbalance indicates the overreliance of India on made in China goods, electronics, and industrial inputs, revealing strategic exposure in some path of crucial provide chains. Petroleum products are the mainstay of bilateral trade, with the UAE continuing to be an important export market and import source for Armenia. The gigantic energy imports (USD 46.2 billion) with negligible exports in the first place due to trade pattern of Saudi Arabia, lead to trade imbalance. Germany has an average trade deficit (USD 6.4 billion) on high-technology capital goods. The analysis indicates where trade diversification via

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new strategic partners and strengthening domestic manufacturing in categories that drive the deficit has the potential to mitigate risks associated with geographical concentration.

V. RESULTS AND DISCUSSION

The purpose of this paper is to introduce a bibliographic analysis linking international trade with economic growth in India through an empirical analysis. In this section statistical results from different analytical techniques (regression, time-series modeling, and comparative approach) are presented and interpreted in theoretical contexts and policy implications.

Table 6: Multiple Regression Results - Determinants of GDP Growth

Variable	Coefficient	Std. Error	t-statistic
Constant	-2.847	1.234	-2.307*
Trade Openness (%)	0.123	0.031	3.968***
Exports/GDP (%)	0.187	0.048	3.896***
FDI Inflows (log)	0.564	0.142	3.972***
Infrastructure Index	0.089	0.037	2.405*
Human Capital Index	0.112	0.054	2.074*
R-squared: 0.847	Adj. R^2: 0.804	F-stat: 19.73***	DW: 1.89

*Note: ***p < 0.001, **p < 0.01, *p < 0.05; Dependent Variable: GDP Growth Rate*

Table 6 includes the results of multiple regressions on the main determinants of GDP growth. This model explains 84.7% of variance in GDP growth (R^2=0.847) and all independent variables are statistically significant. The coefficient on trade openness is positive (0.123, $p < 0.001$), implying that after controlling for other factors, a 10 percentage point greater trade-to-GDP ratio is associated with roughly 1.23% higher GDP growth. As seen, exports have a greater effect and magnitude with a coefficient of 0.187 ($p < 0.001$) implying that the expansion of exports contributes to growth more robustly than general trade openness thus lending credence to the export led growth hypothesis. Our results indicate that FDI inflows have a large and positive effect ($\beta = 0.564$, $p < 0.001$) on investment, emphasizing the importance of foreign capital to finance investment and transfer innovation. Both infrastructure development ($\beta = 0.089$, $p < 0.05$) and human capital accumulation ($\beta = 0.112$, $p < 0.05$) are statistically significant complementary factors, thereby emphasizing the role of domestic capabilities in capturing the benefits of trade. The significance of the overall model was confirmed via the high F-statistic (19.73, $p < 0.001$) and there was no evidence of severe autocorrelation (Durbin-Watson statistic: 1.89). Through multiple channels, these results indicate strong evidence for positive trade-growth linkages in India.

Table 7: Granger Causality Test Results

Null Hypothesis	F-statistic	Decision
Exports does not Granger Cause GDP	8.423***	Reject
GDP does not Granger Cause Exports	3.217*	Reject
Trade Openness does not Granger Cause GDP	6.834**	Reject
GDP does not Granger Cause Trade Openness	2.891*	Reject
FDI does not Granger Cause GDP	5.672**	Reject

*Note: ***p < 0.001, **p < 0.01, *p < 0.05; Lag length = 2*

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In Table 7, results of Granger causality test to find out whether there are directional relationships among variables are presented. Parameter estimates, standard errors and t-statistics are all presented in Table 3 and model summery are shown in Table 4.RCA and GDP growth time series are showing bidirectional causality (exports Granger-causing GDP ($F = 8.423$, $p < 0.001$) and GDP Granger-causing exports ($F = 3.217$, $p < 0.05$). The bidirectional nature of this relationship implies a virtuous circle in which export growth drives growth, and an expanding economy lowers costs and boosts productivity, improving export potential through scale economies. Aside, trade openness and GDP are mutually causal ($F = 6.834$, $p < 0.01$ for trade-to-GDP direction; $F = 2.891$, $p < 0.05$ for GDP-to-trade direction), also showing the endogenous feature that openness promotes growth, and larger economy attracts more trade. Evidence of unidirectional FDI causation is found towards GDP ($F = 5.672$, $p < 0.01$), without significant reverse causation, indicating that FDI is a growth driver not a growth outcome. These types of causality findings have meaningful policy implications, as they demonstrate that positive growth spirals can be initiated through trade and export promotion policies, and conversely that growth creates an enabling environment for trade expansion, although the need for deliberate policy interventions remains key to maximizing the benefits.

Table 8: Sectoral Impact Analysis - Export Growth and GDP Contribution

Sector	Export Growth (%)	GDP Contribution	Elasticity
Manufacturing	12.4	2.87	0.231
IT Services	15.8	1.64	0.104
Pharmaceuticals	18.3	0.98	0.054
Agriculture	6.7	0.52	0.078
Textiles	8.9	0.73	0.082

Differential effects of sectoral export growth on GDP contribution are analyzed in Table 8. Manufacturing exports have the highest elasticity of GDP contribution at 0.231, showcasing a 10% growth in exports leads to around a 2.31% contribution to GDP stemming from the large economic footprint and employment linkages of this particular sector. IT services, while accounting for the highest export growth rate (15.8% per year) within the sector, are only moderately contributing (1.64%) to GDP due to their relatively small size and weak backward linkages (although, it is one of the most important services contributing to foreign exchange and employment in urban areas) with elasticity at 0.104. The specialization of the pharmaceuticals sector characterized by an import-dependent raw material base is reflected in high export growth (18.3%) but low contribution to GDP (only 0.98%). Agriculture, a key basic-important branch, humble increase of 6.7% export, with an elasticity of 0.078 is limited by productivity limitation, and inadequacies in infrastructure, and market access. The performance of textiles is average on all indicators. Such sectoral heterogeneity calls for differentiated policy approaches: manufacturing needs long-term investment in human and operational capacities and technology, services need creation of conducive regulatory environments and skilled labour and agriculture, structural reforms for productivity and value chains.

5.1 Critical Analysis and Comparison with Previous Studies

Our findings are in broad agreement with the results of existing literature while also contributing new knowledge pertinent to the present-day situation in India. The coefficient on trade openness is positive (0.123) and therefore supports the cross-country results of Frankel and Romer (1999), albeit conservatively and potentially capturing India-specific structural features not reflected in their aggregated analysis. The greater influence of exports as compared to overall trade openness is consistent with Sharma and Panagiotidis (2005) who also find evidence of export-led growth for India, but unlike them we perform an aggregate sectoral analysis to show that only manufacturing plays a dominating role in this regard.

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Comparison with the export diversification study by Veeramani (2007) reveals an important evolution. As compared to the period (1990-2005) when Veeramani's assertion was on product variety expansion, quality upgrading and value-addition appears to have gained increasing importance (2000-2021) in the specified time frame, in consonance with the key premise of Topalova and Khandelwal's (2011) analysis of tariff liberalization effects. Conclusion like unidirectional causality from causes the earlier studies reported causality, between exports and GDP growth indicates bidirectional and weakness over the time reverse answer condition within the state specific grants out where Indian trade-growth relation is observed to be matured with expanding and diversifying the economy.

Because our findings on infrastructure and human capital are in support of Sahoo et al. Infrastructure's Mediation Role (2010) though the coefficient magnitude (0.089) indicates that there may be scope for logistics improvement and greater connectivity to have a large positive impact. The human capital effect (0.112) is positive and statistically significant, but modest relative to East Asia, which suggests that investments in skill development and in the quality of education could increase the size of the trade dividend that the region has already been enjoying. This is in line with Rodriguez and Rodrik (2000) who contend that the gains from trade also depend critically on domestic complementary capabilities.

Table 8 shows its decomposition from sectorial heterogeneity which extends Hasan et al. robustness of the GDP contribution elasticity's (2007) manufacturing productivity findings addition by quantifying of differential While services have grown quickly, the elasticity for manufacturing is very high (0.231) and that for services low (0.104), suggesting that manufacturing remains critical for growth with broad-based impact and employment generation. This counters narratives highlighting early transformation of the service sector, indicating balanced sectoral development approaches.

Compared to Asia's successful economies, critical gaps remain. China's manufacturing export elasticity used to exceed 0.35, significantly higher than India's 0.231 because of better infrastructure, industrial clusters and value chain integration with the world. Vietnam's trade-growth coefficients have outperformed those of India in labor-intensive manufacturing for various reasons, including more competitive labor costs and better-targeting FDI policies. These comparisons illustrate that India has made impressive progress driven by trade, but still has a great deal of potential that has yet to be fully realised and that requires targeted interventions for infrastructure, skills, regulations, and integration into higher-value global production networks.

VI. CONCLUSION

The results of this empirical analysis yield clear and strong evidence that international trade influences economic growth in India to different degrees depending on the composition of trade, the characteristics of the appropriate sectors within the economy and the presence of complementary domestic factors. In contrast, as further analysis shows, the export to GDP ratio is a significant predictor of GDP growth ($r = 0.847$, $p < 0.01$) and the regression shows that every 10 percentage point increase in trade openness is associated with a 1.23% increase in GDP growth. Exports are specifically one of the strongest sources of growth effects with an elasticity of 0.187, lending support to export-led growth strategies that India has used since the onset of liberalization. A sectorial breakdown shows stark differences as well, with GDP Contribution Elasticity being highest for manufacturing exports (0.231), followed by IT Services (0.104), highlighting the central role of manufacturing in balanced economic growth, even as the services sector takes a leading position. FDI operates as a Complementary Pillar, expressed by a positive and significant coefficient (0.564); infrastructure and human capital, rather, moderate gains from trade. The Granger causality tests confirm that the relationship between trade variables and the growth is of bidirectional nature, which reflects the presence of virtuous circles where the exports promote growth while the growth enhances the competitiveness of export sectors.

Fundamental challenges noted are continuous merchandise trade deficits, particularly concerning China ($67.5 billion in 2021), high reliance on imports of petroleum goods (28.6% of total imports), and overly concentrated exports in a few sectors and markets. This enables a series of policy recommendations to follow: (1) sales-development of manufacturing exports through various schemes including Production-Linked Incentive schemes as well as infrastructure along industrial corridors; (2) export market diversification as a buffer against excessive concentration; (3) sophistication of export products, probably by rising levels of R&D investment and technology absorption; (4) import substitution in

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particular sectors such as electronics and renewable energy equipment; (5) accelerated trade facilitation reforms reducing transaction costs and enhancing logistics efficiency and (6) skill development initiatives delivering qualifications and competencies needed to support the export sector. Future work might look at microeconomics level industry-wide details, diversities across Indian territories, and consequences of individual agreements on account of growth results. The study finds international trade has played a large role in driving India growth, but fulfilling that promise will require more comprehensive policy frameworks linking trade expansion to domestic capacity building.

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