

20**Determinants of Manufacturing Export in India: The Role of FDI and Production****Devinder Singh Hooda^{1*} & Jyoti Yadav²**¹Associate Professor, Department of Economics at Indira Gandhi University, Meerpur-Rewari-Haryana, India.²Senior Research Fellow, Department of Economics at Indira Gandhi University, Meerpur-Rewari, Haryana.

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Abstract

The paper examines the effect of foreign direct investment and manufacturing output on exports in the post-liberalisation period. After the economic reforms, India adopted an export-led growth strategy supported by various government initiatives such as Export Oriented Units, Special Economic Zones and Export Promotion Capital Goods Program. Secondary data from the World Bank and the Ministry of Commerce and Industry have been used to analyse the relationship between export, foreign direct investment and manufacturing output by using a multiple regression model. The results suggest a strong negative correlation between FDI and exports, which implies the preponderance of marketing-oriented investment. There is a positive correlation for manufacturing output, but it is not statistically significant due to barriers like high costs and limited global integration, and it needs targeted policies to improve export competitiveness.

Keywords: Export, Export-Oriented Policy, FDI, Liberalisation, Manufacturing Output.

Introduction

The post 1991 reform of the Indian economy was a turning point in the development of the country. Before the economic reforms, India pursued a high-substitution-based industrialisation strategy characterised by high tariffs, licensing regulations and limited integration with global trade (Salman et al., 2024; Hooda & Anu, 2025). Indian trade liberalised in 1991 to make the economy more market-oriented by boosting exports and increasing the role of domestic private and foreign investment. Key initial changes included reduced import tariffs, market liberalisation, tax decrease and increased foreign investment (Nambiar & Satam, 2025). In the pre-liberalisation period, there were hardly any non-tariff barriers, as India was a very

small player in global trade, which was 27 per cent of GDP in 1996 compared with the global 45 per cent. In the post-liberalisation period, as India's integration into the global economy deepens, non-tariff barriers will play an increasing role (Banik, 2001). One of the central aspects of these reforms was the switch to an export-oriented growth strategy. Export-led industrialisation was to boost foreign exchange earnings, improve industrial efficiency, and integrate the Indian economy with the world market. Exchange rate laws were liberalised, trade barriers were lowered and quantitative restrictions were removed. These developments enabled companies to compete in the international market and helped the industrial sector to grow (Felipe et al., 2013). Therefore, it is necessary to make a careful assessment of the effect of export-oriented policies on the performance of Indian manufacturing since 1991 (Ghosh & Saikat, 2018). In this paper, an attempt is made to examine the evolution of these policies and to evaluate their effect on key economic indicators such as export, output and foreign investment and identify the potential and problems of export-led industrialisation. The study aims to understand the linkage between policy interventions and the performance of the Indian manufacturing sector. For this purpose, the study combines descriptive analysis with empirical research.

The paper is structured as follows. The introduction part provides the background and context of the research. Section II offers a literature review of export-oriented schemes and export determination. Section III outlines the study's purpose. Section IV presents the research methodology used to determine the export. Section V presents the results and discussion, encompassing the progression of Export-Oriented Schemes, the interrelationships among the variables, and the challenges faced by the manufacturing sector. The concluding section summarises the investigation's findings.

Literature Review

The theoretical and empirical literature has thoroughly examined the relationship between export-oriented policies and the development of the manufacturing sector. Since 1991, India's shift from import substitution to export-driven growth has attracted attention. (Banik, 2001) Analysed the Indian trade framework and non-tariff barriers. The analysis indicated that NTB was of little significance before liberalisation due to India's connection to the foreign market. Liberalisation, trade openness and non-tariff barriers significantly influenced export performance and competitiveness.

(Felipe et al., 2013) focused on the significance of structural transformation in undeveloped economies. Their research shows that export-oriented industrialisation is required for the increase in productivity and economic growth. Despite the rise in manufactured goods exports from India, the authors found that industrial growth in India lagged behind that of East Asian economies, indicating structural issues. (Salman et al., 2024) explored the changes in Indian trade policies and how they

have affected the country's industrial development. Export promotion initiatives, including export-oriented zones, played a big role in boosting export growth by providing financial incentives and improving infrastructure in different industries and regions of the country.

(Cherif & Hasanov, 2024) explored the importance of industrial policy to foster new technological development and to board the export market was discussed. They found that countries with effective export-oriented strategies also had industrial policies, innovation, and workforce development. India's export growth has been aided by regulatory measures, but technological progress is even across sectors.

(Salman et al., 2024) studied the effect of trade liberalisation on the competitiveness of the Indian industry. Lower tariffs and greater foreign investment, especially in industries such as pharmaceuticals and automobiles, enhance efficiency and boost exports, the study found. However, not all industries were equally advantaged.

(R & Dr. Alamelumangai, 2026) performed current research on export supporting policies, including MEIS and RoDTEP, within the framework of international trade policy. The research shows that the programmes increased export and competitiveness and reduced transaction costs. But they only worked if the structural issues, including logistics and compliance costs, were worked out. (Industry, 2026) Export projection plans are a good example of a government report that provides a comprehensive guide to drawing them up. These reports are a reflection of the government's efforts to integrate India into the global value chain through initiatives like the e-production-linked incentives plan. The empirical findings are corroborated by the RBI handbook of statistics, which shows that India's manufacturing exports, FDI inflows and industrial output have all increased markedly since liberalisation in spite of persistent problems like inadequate infrastructure and low international competitiveness. The literature has documented a positive impact of export-oriented policies on industry growth and exports. This gap is due to limited empirical research and less emphasis on the interconnections among exports, output and foreign Direct Investment (FDI).

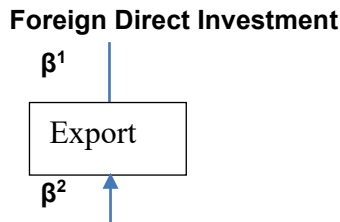
Objectives of the Study

This research aims to examine the evolution of export-oriented policies in India post-1991, highlighting schemes such as EOU, SEZs, EPCG and PLI. It further seeks to analyse the relationship between export, manufacturing output and foreign direct investment (FDI) in the manufacturing sector and to evaluate the role of these policies in promoting manufacturing growth and export performance. Also, the study intends to identify the key challenges faced by the Indian manufacturing sector in attaining global competitiveness.

Research Methodology

This study utilises a quantitative descriptive research design to analyse the effect of export-oriented policies on the Indian manufacturing sector since 1991. The methodology combines policy analysis with empirical study to examine the links among exports, industrial output and foreign direct investment. The research utilises secondary data sourced from the World Bank and the Ministry of Commerce and Industry. The data covers the period from 1991 to 2024, signifying the post-liberalisation phase.

Figure 1: Model of Export Determination



Manufacturing Output

Figure 1 presents the conceptual framework of the study, the relationship among Foreign Direct Investment, manufacturing output, and exporting in the Indian manufacturing sector. Export is treated as the dependent variable, but FDI and Manufacturing output are identified as the primary independent variables affecting export performance.

This study uses both descriptive statistics to understand the evolution of export-oriented policies such as EOU, SEZ, EPCG and PLI and regression analysis to estimate the impact of FDI and Output on exports. The model is estimated using SPSS software.

To ensure the reliability and validity of the empirical results, the following statistical measures are used.

- Coefficient of Correlation (R): Measures the degree of relationship
- Coefficient of Determination (R^2): indicates the explanatory power
- Adjusted (R^2): Measure of model fit
- t-test: Test the significance of individual coefficients
- F-test: Evaluates overall model significance
- p-value (5% level of significance): Statistical validity

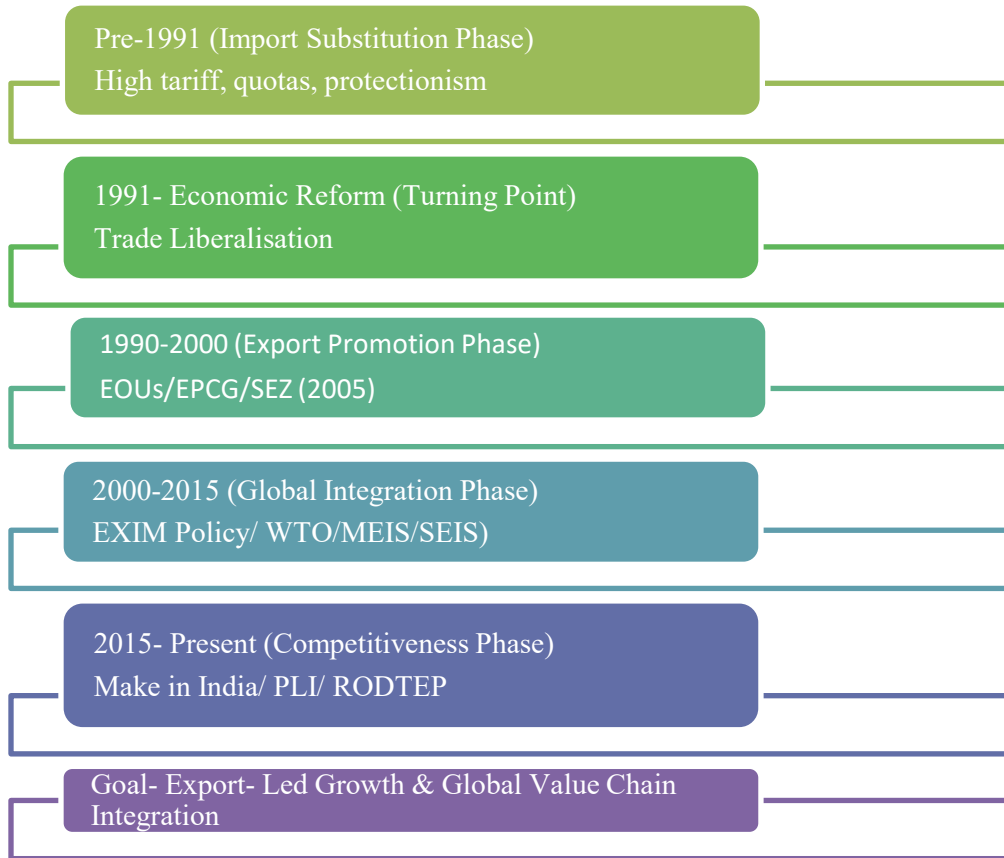
Results and Discussion

In this section, we discuss the key findings of the study. Examine the effectiveness of export-oriented policies in the Indian manufacturing sector and analyse the relationship between the variables.

- **Evaluation of Export-Oriented Schemes**

In 1965, India established the inaugural export processing zone in Asia at Kandla. In 1980, after 15 years, the export-oriented units strategy was implemented to enhance export and augment production. To enhance the efficiency of export and international trade, the foreign exchange service tax, among others, is being considered. The program provides numerous fiscal and non-fiscal incentives to ensure production quality and cost-effectiveness (Sahoo & Goswami, 2016). The Indian government implemented many export-oriented policies and initiatives to enhance industrial exports. The initial phase involved expanding the Export-Oriented Units program, which permitted enterprises to import capital goods and inputs tax-free, contingent on meeting export criteria (Cherif & Hasanov, 2024). A greater number of enterprises nationwide were motivated to participate due to the enhanced flexibility of Export Oriented Units regarding location and operations compared to earlier Export Processing Zones (Sumiyati, 2020). The SEZ Act 2005 instituted special Economic Zones, formalising the expansion of export-oriented industries. Special Economic Zones enhance export performance and attract investment inflow. This was a significant advancement in establishing globally competitive manufacturing clusters characterised by robust infrastructure, efficient procedures and financial incentives (Salman et al., 2024).

The Export Promotion Capital Goods program, which permitted enterprises to import capital goods with minimal or no customs charges, was a significant government initiative that facilitated technological advancement. Companies participating in this program were required to fulfil specific export criteria, which linked capital investment to export outcomes. The Director General of Foreign Trade was to formulate and implement the Foreign Trade Policy. The strategy involved a series of incentive schemes like the Merchandise Export from India Schemes and its successor, the Remission of Duties and Taxes on Exported Product (R & Dr Alamelumangai, 2026). Recently, export-oriented policies have been expanded to include integration into global value chains and large-scale manufacturing. The Production-Linked Incentive Scheme and other schemes are aimed at enhancing domestic production capacity, attracting foreign investment and making exports competitive in key sectors such as electronics, pharmaceuticals and automobiles. The policy changes are reflective of a strategy shift to make India a global manufacturing hub in a more competitive world.



Source: Ministry of Commerce and Industry

However, the effectiveness of export-oriented policies has been hampered by structural challenges such as high costs, infrastructure constraints and limited technological advancement. These schemes have contributed to the growth of exports and industries, but their impact is still uneven and sector-specific. There is a need to improve the policy coordination and implementation.

- **Relationship Between Export, Output and FDI in the Manufacturing Sector**

This section examines the relationship among exports, manufacturing output and FDI in the Indian manufacturing sector. A multiple regression model is employed to analyse the extent to which FDI and manufacturing output influence export performance. The results are presented and discussed below.

The summary evaluates the strength of the relationship between variables, the model's predictive power, and the accuracy of predictions.

Table 1: Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimated
1	.609	.371	.330	4.427494

Notes: Predictors: Constant, Manufacturing Output, FDI

R = 0.609 (lies between -1 and +1); the result indicates a positive relationship between Export, FDI and Output.

R² = 0.371 (0 to 1), which indicates 37.1 per cent of variation in export

Adjusted R² = 0.330; this indicates 33 per cent of explanatory power, which indicates moderate fit (the value of adjusted R is lower than R²).

According to the model summary, the dependent and independent variables have a moderately positive association (R = 0.609), indicating that as the independent factors increase, the dependent variables also increase. The R-square value for the model is 0.371, indicating that 37.1 per cent of the variation in the dependent variable is explained by the model, with other factors influencing the remaining 62.9 per cent. After accounting for the number of predictors, the adjusted R-squared, which represents the model's true explanatory power, is lower at 0.330, suggesting that some variables might not be making a substantial contribution. The estimated standard error is 4.427 and it means that the expected value is different from the actual value.

Table 2: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	357.961	2	178.981	9.142	0.001
Residual	606.931	31	19.578		
Total	964.892	33			

Notes: a. Dependent Variable: Export

b. Predictors: Constant, FDI, Manufacturing Output

The p-value is 0.001, which is less than 0.05. The model shows that FDI and output have a combined effect on exports. The relationship of FDI is negative and significant. This implies that the negative FDI is related to a decrease in exports and output does not significantly affect exports.

The ANOVA table is used to check the statistical significance of the model and the significance of the independent variables (FDI and Manufacturing Output) on the dependent variable (Export) using Regression Analysis. The model variation is 357.961 and the residual sum of squares is 606.931. The ratio of explained and unexplained variation, as indicated by the F-value, is 9.142, which shows a better model fit. Most importantly, the model is statistically significant as the p-value is 0.00, which is less than 0.05. This implies that manufacturing output and foreign direct investment significantly influence exports. All in all, the result indicates that the model is significant, although there is still a large variation in the exports.

Table 3: Coefficients

Model	Unstandardised Coefficient		Standardised Coefficient	t	Sig.
	B	Std. Error	Beta		
<i>Constant</i>	62.135	9.341	-	.6.652	0.00
<i>FDI</i>	-3.696	.879	-.604	-4.203	0.00
<i>Manufacturing</i>	.800	.602	.191	1.328	.194

Source: Author's own calculation on SPSS based on World Bank Data source

Notes: Dependent Variable = Export

The coefficient table shows the effect of each independent variable on the dependent variable. The constant 62.135 is statistically significant ($p=0.0000$). This constant is the expected export when FDI and manufacturing production are zero. The coefficient for FDI is -3.696, showing an inverse relationship: for every 1 unit increase in FDI, there is a 3.696 unit decrease in export. The effect is statistically significant at the 0.000 p-value and -0.604 beta value, meaning that foreign direct investment has a substantial impact on export relative to other variables. Conversely, the positive coefficient of manufacturing output is 0.800, indicating a mean increase in manufacturing output. With a significance value of $0.194 > 0.05$, this variable does not have a significant influence on exports. In conclusion, the only major variable that affects exporters negatively is foreign direct investment and the manufacturing output does not contribute to the model.

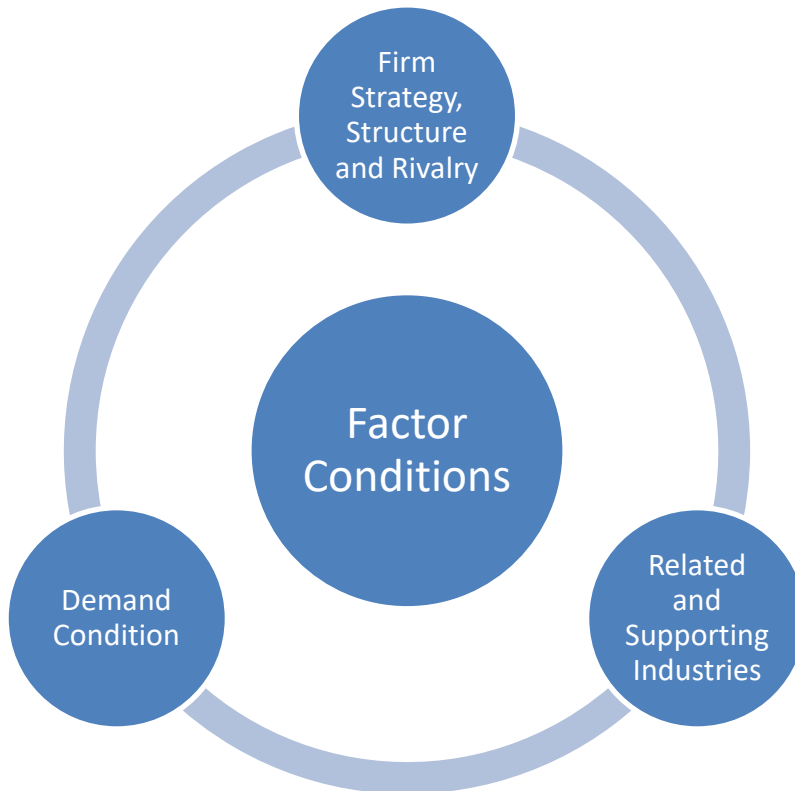
$$Export = \alpha + \beta_1 FDI + \beta_2 Output + et$$

$$Export = 62.135 - 3.696 (FDI) + 0.800(output)$$

The results indicate that foreign direct investment has a significant negative impact on exports. This means that the foreign investment in India is primarily market-seeking rather than export-oriented. There is a correlation between output and export, too. The findings point to structural inefficiencies and the need for a better alignment of output and investment with an export-led strategy. Several studies have found that the inflow of FDI has not been sufficiently oriented to export-oriented manufacturing, thus limiting the impact of FDI on export growth. The literature indicates that rises in industrial output do not automatically translate into higher exports without technological capabilities and efficient trade infrastructure. The results of the present analysis seem to support this latter view, with a significant negative relationship found between manufacturing output and export performance. The paper adds to the existing literature by providing empirical evidence on the effectiveness of foreign direct investment in promoting exports, conditional on the sectoral orientation of investment and the industrial context and pointing to the need for targeted policy measures to match investment inflows with export-led growth strategies.

- **Challenges Faced by the Indian Manufacturing Sector in Achieving Global Competitiveness**

The internal and international policies create factors that affect the nation's export competitiveness. While the importance of import tariffs on exports is important to understand, it is equally important to look at other factors that are significant in affecting export competitiveness for a comprehensive understanding (Sallam, 2021). Porter's model provides a more comprehensive framework for assessing competition between nations and remains one of the more widely used models for competitiveness analysis (Prabhakar et al., 2025). Four determinants are:



Source: (Prabhakar et al., 2025)

- **Factor Conditions:** The nations' factors of production, such as land, labour, capital and infrastructure.
- **Demand Conditions:** The Prevailing domestic market conditions for products or services that shape firm responses to buyer needs.

- **Related and supporting Industries:** The presence or absence of suppliers and complementary industries that play a crucial role in determining competitiveness.
- **Firm Strategy, Structure and Rivalry:** The conditions or environment under which firms operate and manage their business within the nation.

The Indian manufacturing industry faces significant structural challenges that hinder its global competitiveness, particularly compared to countries such as China, Vietnam, and Germany. Costs in India are about 13-14 per cent of GDP as compared to 8-9 per cent record in China and Germany, putting Indian business at a disadvantage in the export sector. China has large industrial clusters and efficient supply chains that bring down production and transportation costs. Vietnam is a competitive manufacturing hub, well integrated into global value chains and with export-oriented foreign direct investment. But India has less integration and less scope to increase exports even with higher output. Indian Labour productivity is also compared with China and Vietnam, where labour efficiency and skill matching improve output per worker. Germany is internationally competitive because of its technological intensity and innovation. India spends about 1 per cent of its GDP on R&D, whereas Germany spends over 2-3 per cent of its GDP on R&D. The technology gap is preventing India from moving up the value chain in manufacturing. Moreover, while MSMEs are the most prevalent type of firms, the presence of interconnected firms is also apparent in China and Germany. India's share in manufacturing as part of GDP is around 16-17 per cent, much lower than China's 25 per cent, highlighting the competitiveness gap that remains. The regional variations indicate that the challenges that India faces are not only to the production capacity but also to the simultaneous achievement of cost efficiency, technical advancement and global integration.

Conclusion

The paper examines the impact of export-oriented policies on the Indian manufacturing sector after the economic reforms of 1991. The shift to an important structural revolution in the Indian economy. The government has implemented several policy measures to improve the country's export competitiveness, to attract foreign investment and to improve manufacturing capabilities. This includes Export Oriented Units, Special Economic Zones, the Export Promotion Capital Goods schemes, and more recently, the Production Linked Incentive Scheme. The analysis shows that these measures have helped a lot in the development of the Indian manufacturing sector, increased export volumes and foreign investment. Descriptive data show a sharp increase in manufactured exports, industrial production and investment inflows following deregulation. The degree of interconnectedness of these factors is complex. The empirical results of the study show a moderate overall

correlation between export, FDI and manufacturing output, but the specific effects are quite different. The Foreign Direct Investment has a negative and statistically significant relationship with exports. It means that the foreign investment in India has been more marketing-seeking rather than export-oriented. Exports are positively correlated with the manufacturing output, but not statistically significant. This means that higher output does not necessarily mean more exports. These results suggest structural constraints in the Indian manufacturing sector. High logistics costs, poor infrastructure, low technological development and limited integration into the global value chain remain challenges to export competitiveness. India is losing productive cost efficiency and huge industrial clustering as compared to China and Vietnam. The falling share of manufacturing in GDP suggests the need for continued policy intervention. The analysis suggests that the effect of export-oriented policies on industry has been conditional, varying and positive. The success of such a programme depends on incentive, but also on the wider industrial environment, technical integration, talent development and trade facilitation. From a policy point of view, it is important to direct foreign investment to export-oriented sectors and improve backwards and forward linkages with the global value chain. This study adds empirical evidence on the interlinkages between export, FDI and output in India to the debate on trade liberalisation and industrial strategy. It highlights the need to move from policy formulation to effective implementation and structural reforms for sustainable growth in the manufacturing sector.

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