National Research Journal of Human Resource Management
Volume No: 12, Issue No: 2, Year: 2025 (July-December)
PP: 85-94
ISSN: 2394-059X
Peer Reviewed & Refereed Journal (IF: 7.25)
Journal Website www.nrjhrm.in

IMPACT OF FDI INFLOWS AND AGRICULTURAL EXPORTS ON ECONOMIC GROWTH IN INDIA: A POST REFORM ANALYSIS

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ABSTRACT

This study explores the influence of Foreign Direct Investment (FDI) inflows on India's agricultural exports and economic growth, using an econometric approach. By using data from the year 1991 to 2022 which was obtained from the World Bank Indicators, Reserve Bank of India (RBI), World Integrated Trade Solution (WITS), and International Trade Centre (ITC), the research aims to deduce the long-run relationship between FDI inflows, agricultural exports, and Economic growth in the country. FDI as well as Agricultural Exports are hypothesised to positively influence Economic development in India. The analysis uses the Autoregressive Distributed Lag (ARDL) model to inspect the long-run equilibrium between the variables. The results indicate a positive and statistically significant relationship between the variables. This suggests that increased inflows into the country along with agricultural exports have fostered economic development in India. The study provides empirical evidence of the benefits of agricultural exports and the inflow of overseas funding for India's economic well-being, highlighting the importance of policies that attract foreign investment to enhance agricultural productivity and competitiveness.

Keywords- Economic Growth, Economic Reforms, Agriculture Exports, FDI, ARDL, India.

I. INTRODUCTION

The integration of India’s economy into the global marketplace, particularly following the liberalization policies of the 1990s, has significantly transformed its agricultural sector and economic growth dynamics. Globalization, characterized by increasing trade flows, foreign direct investment (FDI), and the diffusion of technology, presents both opportunities and challenges for Indian agriculture. As a sector that remains a vital part of the Indian economy by employing a substantial share of the population and contributing meaningfully to the national GDP, the interaction between agriculture and global economic forces plays a crucial role in shaping economic growth.

This interaction can be conceptualized as a triangular relationship among GDP growth, FDI inflows, and agricultural exports, where each element influences and reinforces the others. The export-led growth hypothesis suggests that expanding agricultural exports, where India holds comparative advantages, can stimulate GDP growth through increased foreign exchange earnings and access to broader markets. At the same time, FDI, explained by the Solow-Swan growth model and technological diffusion theories—augments domestic capital, introduces advanced technologies, and improves productivity, thereby enhancing both economic output and export performance. In the Indian agricultural context, these may include fertile land, abundant labor, and access to both domestic and international markets.

The opening of agricultural markets has theoretically expanded opportunities for Indian farmers to access global markets, potentially increasing agricultural export revenues. However, this openness also exposes Indian producers to heightened global competition,

ISSN: 2394-059X
Peer Reviewed & Refereed Journal (IF: 7.25)
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creating a need for improvements in productivity, quality, and compliance with international standards. The entry of Foreign Direct Investment into the agricultural sector promises modernization through the adoption of advanced technologies, better infrastructure, and more efficient supply chains. These developments can boost agricultural productivity and competitiveness on the global stage.

However, globalization also brings potential risks. Small-scale farmers may face increased vulnerability due to fluctuations in global commodity prices and the growing influence of large-scale agribusinesses, which can displace traditional farming practices. Furthermore, conditions tied to international trade agreements and the expanding role of multinational corporations can create market imbalances that negatively affect local agricultural communities.

Given these opportunities and challenges, a complex understanding of the association between agricultural exports, FDI inflows, and economic growth is significant. This calls for rigorous empirical investigation. An econometric approach, utilising statistical methods to analyze the historical data and control for influencing factors, can shed light on the strength and direction of these relationships. Such analysis can help assess the extent to which globalization, through FDI and agricultural exports, has contributed to India's economic growth, thereby providing valuable insights for shaping future policy decisions.

II. REVIEW OF LITERATURE

Sharma G & Sharma N. (2023) delves the intricate connection between foreign trade and India's economic growth for the time span 1975 to 2022, further exploring the impact of globalization and economic changes. Using the Autoregressive Distributed Lag (ARDL) technique, a robust econometric approach, the study seeks to quantify these influences, utilizing time series data and incorporating the Bounds test, Error Correction Mechanism (ECM), diagnostic statistics, and optimal lag length selection. By exploring exports and imports of both goods and services as independent variables, the research provides a more granular perspective on the trade-growth relationship. The study's findings, validated by the Bounds test, confirm the existence of a long-term relationship between the variables under consideration.

Owutuamor and Arene (2018) inspected the Foreign Direct Investment's influence on Nigeria's agricultural growth (1981-2014). By utilising time series data and OLS regression. The study found a non-significant and positive relationship between FDI and agricultural growth, suggesting other macroeconomic factors masked its effect. Moreover, the study also found significant positive links between agricultural economic growth and macroeconomic instability, while interest rate differentials showed a negative correlation. Granger causality tests revealed unidirectional causality from FDI, external debt, and price variability to agricultural growth, and from agricultural growth to macroeconomic instability. The study highlights Nigeria's low agricultural FDI and recommends government policies to attract investment and ensure macroeconomic stability.

Epaphra and Mwakalasya (2017) explored FDI's impact on Tanzania's agricultural sector and economic growth for the time period 1990-2015, using OLS regression. The study found non-significant effect of FDI on the contribution of agriculture's GDP, despite overall positive FDI inflows. However, FDI showed a positive correlation with real GDP growth. The agricultural sector, despite employing most of the workforce, contributed minimally to GDP, indicating inefficiency. The study suggests increased FDI to improve agricultural productivity. Robust diagnostic tests validated the model's reliability. The research highlights the need for targeted FDI to boost agricultural output and economic growth.

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Pelinescu and Dulescu (2009) examined the impact of Foreign Direct Investment on economic growth and export potential, arguing that FDI has a positive correlation with GDP growth in both developed and developing countries. They highlighted the IMF and World Bank's advocacy for FDI to stimulate development, particularly in transition economies. The study asserts FDI facilitates economic re-specialisation, moving countries beyond raw material exports and the study believe FDI is crucial for restructuring transition economies and boosting manufactured goods production. They further analysed structural changes in new EU member states due to FDI. The research emphasises FDI's role in driving economic growth and export diversification.

Haddad and Harrison (1993) explored the existence of encouraging spillovers from foreign direct investment (FDI) using panel data from Morocco. Their study aimed to determine if FDI generated benefits beyond the direct investment itself, such as technological or managerial knowledge transfer to local firms. They focused on analyzing whether domestic firms experienced productivity gains due to the presence of foreign-owned enterprises. Employing econometric techniques on panel data, the authors explored the potential spillover effects within the Moroccan context. Their research contributes to the understanding of FDI's impact on developing economies, specifically examining the potential for indirect benefits to local industries. The study is a key example of early empirical work on FDI spillovers.

III. OBJECTIVE AND HYPOTHESIS

The study aims to analyse the impact of Foreign Direct Investment Inflows and agricultural exports on Economic growth in India.

Hypothesis

H_0- There exists no relationship between FDI Inflows, agricultural exports and Economic growth in India.

H_1- There exists a relationship between FDI Inflows, agricultural exports and Economic growth in India.

IV. RESEARCH METHODOLOGY

The research methodology used in the following rseapaper is explained below. This includes the explanation of various factors affecting the variables (dependent and independent) used for the study, data collection and model specification.

i. Variables' Explanation

1. Independent Variables

1.1 Agricultural Exports

Agricultural Exports of a country are affected by a variety of factors ranging from economic factors, policy-related factors, structural as well as external factors. These can be broadly classified into 4 categories- Supply Side Determinants, Demand Side Determinants, Policy-Related Determinants and Macroeconomic Factors.

a) Supply Side Determinants

- **Agricultural yield and productivity:** Technological advancements, innovations, mechanization and improved irrigation facilities boost the production capacity. This can be illustrated with a sudden rise in the agricultural produce as a result of the green revolution.

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- **Availability and Utilization of Land:** Global exports are dominated by the countries with large arable lands, since the export volumes are directly affected by the land productivity.
- **Input prices and Production Costs:** Cheap labour and affordable inputs contribute towards making the agricultural exports more competitive.
- **Climatic Conditions:** Since agriculture is dependent majorly on weather conditions, favourable conditions can boost production.

b) Demand Side Determinants

- **Population and food demand:** The extent of population growth along with the population structure determines the demand for agricultural produce.
- **Income and Purchasing Power:** High purchasing power of citizens in a country calls for demand for pricey agricultural goods, such as organic foods.
- **Consumer Preferences and Product Quality:** Various developed countries restrict agricultural imports from countries supplying sub-standard products. Apart from this, consumer's preference is given utmost importance to decide the type of agricultural produce to be imported from other countries.
- **Exchange Rate Fluctuations:** Depreciation of the currency in exporting country makes its products cheaper, subsequently increasing their competitiveness.

c) Policy-Related Determinants

- **Incentives and export Subsidies:** Governments of various countries provide tax-benefits and subsidies to encourage export of various agricultural products.
- **Trade Agreements:** Free Trade Agreements boost exports among the countries, while trade restrictions put a constraint on the agricultural exports.
- **Hygiene and Phytosanitary Measures:** Stringent policy measures relating to food safety and quality in exporting countries may restrict import from certain countries.
- **Export Restrictions:** To control inflation in the prices of certain goods or stabilize the economy, restrictions are imposed on agricultural exports in order to ensure food security.

d) Macroeconomic Factors

- **Global Prices:** Fluctuations in global prices of various goods affect the revenues of exporting countries.
- **Transportation Costs:** Transportation costs surge due to increased fuel prices, thereby reducing the profitability of exporting countries.
- **Trade Relations:** Geo-political conflicts and trade disputes negatively affect the trade between the countries, especially the agriculture based products.
- **Global Supply Chain:** Export logistics are adversely affected by the inefficient supply chain, such as container shortages.

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1.2 Foreign Direct Investment Inflows

Foreign direct investment (FDI) is a way for a company to invest in another country, often by taking ownership or establishing new operations, with the long-term goal of fostering business there. This is different from portfolio investment, which is a shorter-term investment in a company's stocks or bonds. A number of factors, both short-term and long-term, can influence the flow of FDI into a country.

a) Short-Run Factors

- Exchange Rate Fluctuations: Sudden changes in a country's exchange rate can impact the profitability of foreign investments. For example, if a host country's currency strengthens, its exports become more expensive, and imports become cheaper. This can hurt the competitiveness of foreign-owned companies operating there.
- Global Economic Conditions: Global economic downturns, recessions, or financial crises can cause a significant drop in FDI. During these periods, demand for goods and services falls, reducing the potential profits from foreign investments. Financial crises also make it more difficult and expensive for companies to secure the credit needed for foreign investments.
- **Government Policy Changes:** Shifts in a government's policies, such as changes to tax laws, regulations, and trade agreements, can affect a country's ability to attract foreign investment. While tax incentives like lower corporate tax rates can draw in investors, new regulations or higher taxes can increase costs and deter them.
- **Commodity Prices:** For FDI projects based on natural resources, like mining or oil extraction, changes in commodity prices are crucial. A rise in prices can boost profitability and attract more investment, while a fall can lead to reduced investments or even project cancellations.
- **Political Instability:** Political instability, including civil unrest or war, poses a risk to foreign investors. Such uncertainty can erode investor confidence and economically harm the host country, leading to less new investment and potential capital flight.
- **Interest Rates:** Changes in interest rates affect the cost of borrowing for foreign investors. Higher interest rates can make it more expensive to finance projects, lowering their profitability. Conversely, falling rates can make foreign investments more appealing by reducing borrowing costs.

b) Long-Run Factors

- **Market Size and Growth:** Countries with a large consumer base and a growing economy are highly attractive to foreign investors. A bigger market offers more opportunities for a substantial return on investment.
- **Natural Resources:** Foreign investors are often drawn to countries rich in natural resources, such as minerals, oil, and gas. Resources that are essential for global industries, like rare earth minerals, can be particularly effective in attracting FDI as investors look to exploit them.
- **Infrastructure:** A country with a well-developed infrastructure—including efficient transportation, reliable energy, and strong telecommunications—is more appealing to investors. Good infrastructure reduces operational costs and boosts productivity, which are essential for businesses to thrive.

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- **Human Capital:** Governments that invest in education and training can develop a skilled and educated workforce, making their country more attractive to foreign investors. A strong workforce can drive productivity, innovation, and competitiveness, which is a major asset for foreign companies.
- **Technological Development:** Countries with a robust foundation for research and development are more likely to attract technology-focused FDI. The presence of advanced technology, research institutions, universities, and technology parks fosters innovation and draws in foreign investment**.**

2. Ddependent Variable (Economic Growth)

Gross Value Added (GVA) is taken as a substitution for Economic Growth for this study. The term refers to the value of goods and services produced by all sectors in an economy, before accounting for taxes and subsidies.

Various factors determine the level of production in a country, such as:

a) Investment and Capital Formation
b) Technological Advancement
c) Infrastructural Development
d) Trade and Export Performance
e) Global Market Conditions
f) Institutional and Market Reforms
g) Government Policies
h) Input Costs and Availability

ii. Data Analysis

To analyse the relationship between the selected variables, ARDL Bounds testing is used to check for the presence of a long-run relationship for the time period from 1991 to 2022. The following steps are performed for the estimation procedure.

Firstly, the presence of a unit root in the variables is checked by using the Augmented Dickey-Fuller test (ADF), which was given by D.A. Dickey. With the help of these results, ARDL Bound testing approach is used in the further step to examine the long-run relationship between the variables.

Lastly, the Residual testing is used to check for the presence of serial correlation, heteroscedasticity and normality in data.

V. RESULTS

Long Run Analysis- A Bound Testing Approach

For practical analysis of the variables in the long run, the study takes Economic Growth as the dependent variable, for which Gross Value Added (GVA) is taken as a proxy. While, Agricultural Exports (AGEX) and Foreign Direct Investment Inflows (FDI) are taken as the independent variables. The equation of the model is as follows:

$$GVA_t = \alpha_o + \alpha_1 FDI + \alpha_2 AGEX + \varepsilon_{1t} \quad (1)$$

Where, $\alpha_{o,}$ is a constant, α_1 is a coefficient of FDI and measures the effect of a one-unit change in the FDI and AGEX on GVA in the Indian economy, holding other factors as

ISSN: 2394-059X
Peer Reviewed & Refereed Journal (IF: 7.25)
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constant and ε_{1t} is the error term in the model. All variables are transformed into their natural logarithms. The final description of the model is presented in succeeding equation:

$$\ln GVA_t = \alpha_o + \alpha_1 \ln FDI + \alpha_2 \ln AGEX + \varepsilon_{1t} \quad (2)$$

As there is a condition required by the ARDL model for the variables to be stationary at either I(0) or I(1) levels, the stationarity of the variables is checked using the Unit root tests. The unit root is checked at both at level and at the first difference level, using the ADF test. The hypothesis for the Unit Root test are given below.

H_0: The series is non-stationary (Unit Root)

H_1: The series is stationary (No Unit Root)

The presence of a unit root is checked for all variables – Agricultural Exports (AGEX), Foreign Direct Investment Inflows (FDI), and Gross Value Added (GVA). The results are exhibited in the tables given below.

Table 1: Unit Root ADF, AGEX

Tests	**ADF**
Level (Intercept)	0.8448
Level (Trend and Intercept)	0.3519
1st Difference (None)	0.0017

Source: Computed

The p-value of AGEX deduced at different levels is given in the above table. The value at first difference (None) is 0.0017 < 0.05, which indicates that the series is stationary at I(1).

Table 2: Unit Root ADF, FDI

Tests	**ADF**
Level (Intercept)	0.0324

Source: Computed

The results indicated that FDI is stationary at I(0), as depicted in Table 2. The ADF test gives a p-value of 0.0324, which is statistically significant.

Table 3: Unit Root ADF, GVA

Tests	**ADF**
Level (Intercept)	0.08528
Level (Trend and Intercept)	0.8720
First Difference (None)	0.0001

Source: Computed

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The GVA series is stationary at I(1), as depicted in Table 3. The ADF test gives a p-value of 0.0001, which is statistically significant. Hence, we reject the null hypothesis, i.e there is no unit root present and the series is integrated of order 1.

The given results qualify for the usage of ARDL model to deduce the long-run relationship between the variables.

In the next step, the existence of a long-run relationship is examined by using the Bounds test approach. Following are the ARDL equations of the model, when AGEX and FDI are the independent variables:

$$\Delta\ln(GVA)_t = \alpha_0 + \sum_{i=1}^{p-1} \lambda_i \Delta \ln(GVA)_{t-i} + \sum_{j=0}^{q-1} B_j \Delta\ln(FDI)_{t-j} + \sum_{k=0}^{r-1} \theta_k \Delta\ln(AGEX)_{t-k} + \delta_1 \ln(GVA)_{t-1} + \delta_2 \ln(FDI)_{t-1} + \delta_3 \ln(AGEX)_{t-1} + \epsilon_{1t} \quad (3)$$

Where δ_1, δ_2 and δ_3 are the long-run multipliers in the ARDL model, while bj, c_k and d_m are the short-term dynamic coefficients. While α_0 is the constant and ε_{1t} is the error term.

The null hypothesis, H_0: $\delta_1 = \delta_2 = 0$, which assumes no co-integration between the variables, is being tested against the alternative hypothesis,

H_1: Atleast one $\delta \neq 0$, i.e ($\delta_1 \neq 0$ and/or $\delta_2 \neq 0$, which suggests the presence of co-integration.

Table 4 presents the outcomes of the Bounds test.

Table 4: F- Bounds test				
Significance	10%	5%	2.5%	1%
I(0)	2.63	3.1	3.55	4.13
I(1)	3.35	3.87	4.38	5
F-Statistic	10.95523			
Source: Computed				

As per the criterion, if the f-value is lower than the I(0) bound, null hypothesis cannot be rejected. This implies that there is no co-integration between the variables.

However, if the f-value is higher than the I(1) bound, in that case null hypothesis can be rejected. This implies that there is a existence of long run relationship between the variables.

Here, the ARDL Bounds test results depict that the f-statistic value = 10.95523, which is higher than the upper bound I(1) at all levels of significance. So, it suggests a strong long-term relationship occurs between the variables.

1.2 Residual Testing

A Residual testing of the model has been done to check for the presence of heteroscedasticity and serial correlation. The results presented in tables 5 and 6 indicate that the model is well fitted and is free from both problems.

Table 5: Breusch-Godfrey Heteroskedasticity Tests		
Adjusted R-square	R-square	Prob.
0.031648	0.160762	0.3166
Source- Computed		

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Peer Reviewed & Refereed Journal (IF: 7.25)
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Table 6: Breusch-Godfrey Serial Correlation LM Tests	
F-statistic	Prob.
0.239909	0.7886
Source- Computed	

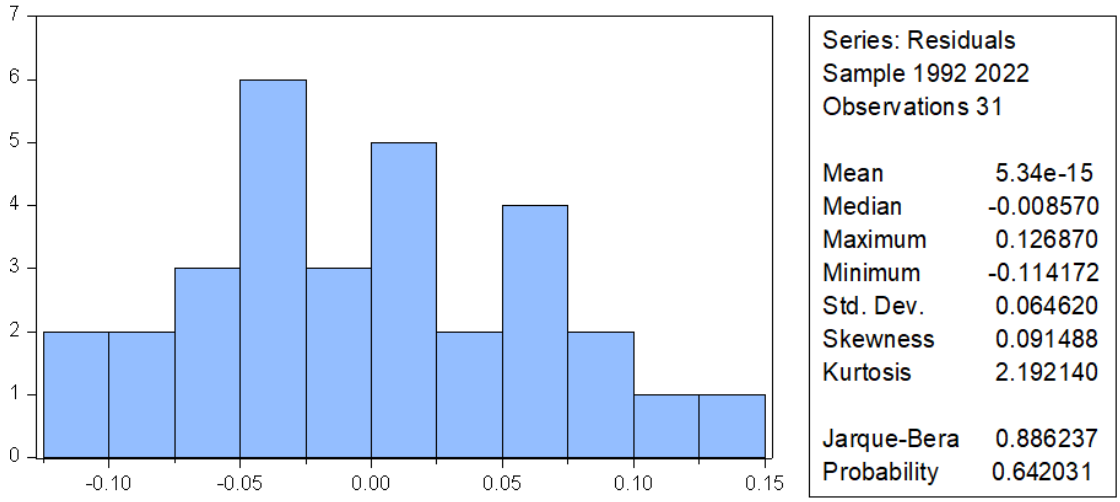
It is evident from the p-value, which stands at 0.3166 > 0.05. Hence, we fail to reject the null hypothesis of homoskedacticity. This indicates that there exists no evidence of heteroscedasticity.

For serial correlation among the variables, the p-value = 0.7886 > 0.05, which is statistically significant. This implies that the model does not suffer from serial correlation from the residuals.

Thus, the model is a good fit for analysis.

1.3 Normality test

A normality test is used to ascertain if the dataset used for analysis is drawn from a population which follows a normal distribution. For the purpose of this study, Jarque-Bera Test to check skewness and kurtosis, and Shapiro Wilk test is used to check normality of the data used.



The p-value as revealed by the test results is 0.642031 > 0.05, which indicates that the data is likely to be normally distributed. The coefficient of Jarque Bera Test = 0.886237, which indicates that the skewness and kurtosis of the data are close to that of a normal distribution (lower the better).

VI. CONCLUSION

The empirical analysis confirms the significant impact of FDI inflows and Agricultural Exports on GVA in the long run. This implies that GVA is significantly influenced by both agricultural exports and FDI inflows, thereby calling for the need for policies to attract more funding from other countries as well as boost agricultural exports, thereby contributing to GVA expansion and promoting long-term economic growth.

This can be done by strengthening the industrial productivity, infrastructural improvements, and fostering innovation. Apart from this, Agricultural Export Competitiveness must be

ISSN: 2394-059X
Peer Reviewed & Refereed Journal (IF: 7.25)
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fostered by the implementation of technology-driven agricultural practices and advancements in the supply chain efficiency. A reduction in the input costs and improving the trade facilitation measures can also help in boosting AGEX. Moreover, integration of FDI with agriculture by employing the long-term investment strategies should be emphasised by the policymakers.

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