

Foreign Direct Investment and Trade Integration in India: Evidence from a Dynamic Macroeconomic Framework

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Abstract

This study examines the long-run, short-run, and predictive relationships between Foreign Direct Investment (FDI) and key macroeconomic variables in India during the post-liberalisation period. The core analysis covers Gross Domestic Product (GDP), Gross Domestic Savings (GDS), Gross Fixed Capital Formation (GFCF), exports, and imports, with 1990 used as a pre-reform benchmark and 1991–2023 for the econometric analysis. The methodology combines unit-root tests, VAR lag selection, Johansen cointegration, VECM estimation, and Granger predictability tests. The results confirm one long-run cointegrating relationship. The FDI error-correction coefficient is negative and highly significant (-0.328 , $p < 0.001$), indicating that about 32.8% of disequilibrium is corrected within one year. Short-run results show that lagged GDP growth significantly predicts FDI, while system-level tests indicate that GDS and GFCF predict FDI, whereas FDI predicts exports and imports. No robust bidirectional FDI–GDP predictability is found. The findings support an FDI–domestic-capability complementarity mechanism, suggesting that stronger domestic savings and productive capacity attract FDI, while foreign investment subsequently reinforces external-sector integration.

Keywords: Foreign Direct Investment; Domestic Capability; Macroeconomic Dynamics; India; Cointegration; Vector Error Correction Model; Granger Predictability; Gross Domestic Savings; Capital Formation; Trade Integration

Introduction

India's economic reforms of 1991 marked a decisive transition from a relatively regulated and inward-oriented economy towards a more liberalised, market-driven and globally integrated system. Industrial deregulation, progressive liberalisation of foreign investment, trade reforms and deeper participation in international markets transformed the operating environment for domestic firms and multinational enterprises alike. Within this evolving framework, Foreign Direct Investment (FDI) emerged as an increasingly important component of India's external economic engagement, with the potential to augment capital formation, facilitate technology transfer, improve managerial and organisational practices, enhance productivity and strengthen participation in global production networks.

The relationship between FDI and macroeconomic performance, however, is not necessarily one-directional. The FDI-led-growth hypothesis views foreign investment as a source of capital, technology, competition and export expansion. The growth-led-FDI hypothesis, by contrast, emphasises that a larger domestic market, stronger savings, greater capital formation, improved infrastructure and deeper trade integration can themselves attract foreign investment. India provides an important setting for examining these alternative mechanisms. Between 1990 and 2023, FDI expanded substantially alongside sustained increases in GDP, exports, imports, foreign-exchange reserves, domestic savings, fixed capital formation and per capita income. Trade openness also increased sharply. These parallel trends indicate substantial structural transformation and greater integration with the global economy, but they do not establish whether FDI has primarily driven economic performance, responded to stronger domestic fundamentals, or evolved as part of a mutually reinforcing process.

The empirical analysis of these relationships is complicated by the time-series properties of macroeconomic data. Variables such as GDP, savings, investment, trade and FDI typically exhibit strong trends and may be non-stationary. Consequently, high correlations in levels may reflect common stochastic trends rather than meaningful economic relationships. A rigorous assessment must therefore distinguish between descriptive co-movement, long-run equilibrium, short-run adjustment and temporal predictability.

Against this background, the present study examines FDI within a broader macroeconomic framework. The principal dynamic model focuses on FDI, Gross Domestic Product (GDP), Gross Domestic Savings (GDS), Gross Fixed Capital Formation (GFCF), exports (EXP) and imports (IMP). GDP captures overall economic activity, GDS reflects domestic resource mobilisation, GFCF represents productive investment capacity, and exports and imports capture distinct dimensions of trade integration. Gross National Income (GNI), Net National Income (NNI), Per Capita Income (PCI) and foreign-exchange reserves are retained for descriptive and supplementary analysis.

The empirical strategy proceeds from descriptive and correlation analysis to unit-root testing, VAR lag-length selection, Johansen cointegration, Vector Error Correction Model (VECM) estimation and system-level Granger causality/temporal predictability tests, supported by appropriate diagnostic and stability checks. This framework enables the study to distinguish long-run equilibrium from short-run dynamics and to identify whether domestic macroeconomic conditions predict FDI, whether FDI precedes subsequent changes in economic and trade performance, or whether feedback effects are present.

Review of Literature and Research Gap

The theoretical literature identifies several channels through which FDI may influence host economies. Conventional growth theory treats FDI as an addition to the domestic capital stock, while endogenous-growth approaches emphasise technology transfer, knowledge spillovers, human-capital interaction and productivity gains. Dunning's (1993) eclectic paradigm further highlights host-country advantages such as market size, infrastructure, resource availability, institutional conditions and access to regional and global markets as important determinants of FDI location.

Empirical research also shows that the benefits of FDI depend on domestic absorptive capacity. Balasubramanyam, Salisu and Sapsford (1996) emphasised the importance of an outward-oriented trade regime, while Borensztein, De Gregorio and Lee (1998) showed that the growth effects of FDI depend on the host economy's ability to absorb advanced technology. De Mello (1999) similarly found that the effects of FDI on capital accumulation and productivity vary across countries, indicating that its contribution to growth is conditional rather than automatic.

Domestic financial and investment conditions constitute another important dimension. Alfaro et al. (2004) demonstrated that the growth benefits of FDI are stronger where domestic financial markets are sufficiently developed to allocate resources effectively and support linkages with local firms. The domestic-savings literature also underscores the continuing importance of national saving and investment in capital formation, suggesting that domestic and foreign capital may operate as complements rather than substitutes.

The relationship between FDI and trade is equally complex. Export-oriented FDI may increase exports through improved technology, scale economies, product quality and access to multinational distribution networks. Conversely, strong export performance may attract foreign investors by signalling competitiveness and access to international markets. Imports may facilitate FDI when foreign firms rely on imported machinery, technology and intermediate inputs, although high import dependence may also indicate structural weaknesses. These differing mechanisms justify analysing exports and imports separately rather than combining them into a single trade-openness measure.

For India, Chakraborty and Basu (2002) demonstrated that the FDI-growth relationship is dynamic and should be analysed within a long-run time-series framework. Chakraborty and Nunnenkamp (2008) further showed that the relationship varies across sectors, with stronger mutual reinforcement in some activities than others.

Research Gap

Despite a substantial literature, three gaps remain relevant. First, many India-focused studies concentrate primarily on the FDI–GDP relationship and devote less attention to the role of domestic savings and fixed capital formation as conditions that may attract FDI. Second, trade is often represented through an aggregate openness indicator, which can obscure potentially different relationships between FDI, exports and imports. Third, relatively fewer studies distinguish clearly between long-run equilibrium, short-run adjustment and multivariate temporal predictability within a unified framework.

The present study addresses these gaps by examining FDI together with GDP, GDS, GFCF, exports and imports in a dynamic multivariate setting, while retaining broader income and reserve indicators for descriptive and supplementary analysis. This framework allows the study to evaluate not only whether FDI is associated with macroeconomic performance, but also whether FDI subsequently predicts changes in output and external-sector performance.

Objectives of the Study

1. To examine the long-term trends and structural transformation of FDI and key macroeconomic indicators in India during the post-liberalisation period.
2. To analyse the long-run equilibrium and short-run dynamic relationships between FDI and GDP, GDS, GFCF, exports and imports using cointegration and VECM techniques.
3. To investigate the direction and strength of temporal predictability between FDI and economic growth, domestic savings, capital formation, exports and imports within a multivariate framework.
4. To assess the role of domestic economic capability and trade integration in shaping FDI inflows and their implications for India's growth and structural transformation.

Data and Methodology

Research Design, Period and Data Sources

The study adopts an empirical, analytical and quantitative research design using annual macroeconomic time-series data for India. The year 1990 is retained as a pre-reform benchmark for descriptive analysis, while the principal econometric analysis focuses on the post-liberalisation period through 2023. The data are compiled from established statistical sources identified in the study, including the Reserve Bank of India, Economic Survey, Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, World Development Indicators and UNCTAD.

Variables and Trade-Openness Measure

The analysis considers FDI inflows together with GDP, GDS, GFCF, GNI, NNI, PCI, exports, imports, and foreign-exchange reserves. Trade openness is used as a descriptive indicator of international integration and is measured as:

$$TO_t = [(EXP_t + IMP_t) \div GDP_t] \times 100$$

Empirical Results and Discussion

Structural Transformation of the Indian Economy

The descriptive evidence shows a pronounced structural transformation after liberalisation. FDI increased from Rs 191 crore in 1990 to Rs 6,17,346 crore in 2023, while GDP increased from Rs 25,14,549 crore to Rs 1,73,81,722 crore. Trade openness rose from about 3% to 53%, and FDI as a share of GDP increased from 0.008% to 3.552%, after reaching 4.670% in 2020. These changes show that the expansion of foreign capital occurred alongside a wider integration of the Indian economy with global product and capital markets.

Table 1. Selected Indicators of India's Structural Transformation

Year	FDI (Rs crore)	GDP (Rs crore)	Trade Openness (%)	FDI/GDP (%)
1990	191	25,14,549	3.0	0.008
2000	18,727	43,26,736	9.9	0.433
2010	1,50,131	83,01,235	34.0	1.809
2015	3,92,422	1,13,69,493	37.0	3.452
2020	6,39,521	1,36,94,869	37.1	4.670
2023	6,17,346	1,73,81,722	53.0	3.552

Source: Author's compilation from the study dataset.

Over 1990-2023, the reported compound annual growth rate of FDI is 27.75%, compared with 6.03% for GDP, 15.35% for exports, 15.88% for imports, 20.51% for foreign-exchange reserves, 7.31% for GFCF, 13.25% for GDS, and 10.86% for PCI. The exceptionally high FDI growth rate partly reflects its very low starting base, but the scale of the increase nevertheless confirms the rising importance of foreign capital in the post-reform economy.

Figure 1. Indexed macroeconomic trends, 1990-2023

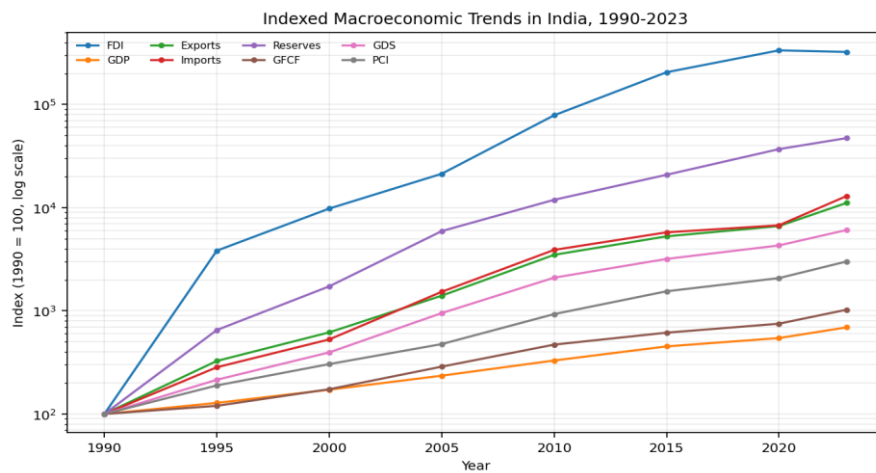
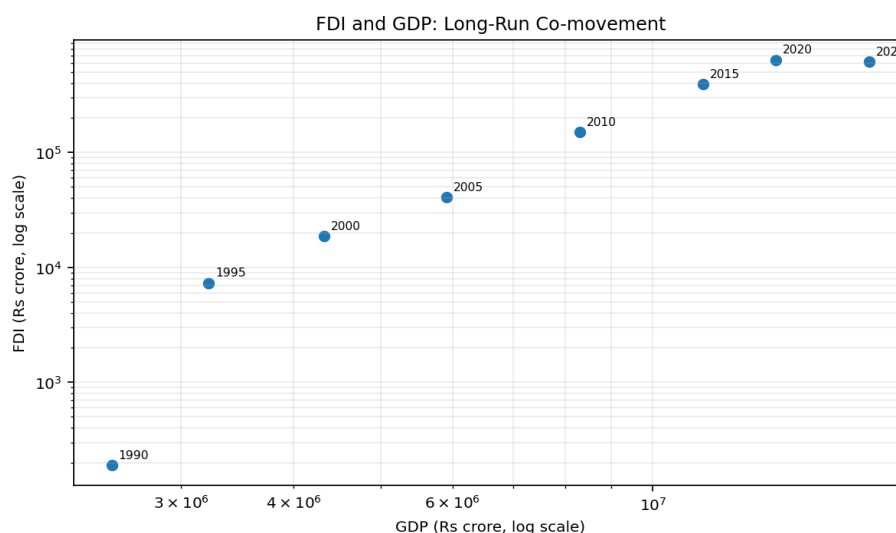


Figure 1 makes the relative transformation visually explicit. FDI grows much faster than the more gradual rise in GDP and PCI, while trade and reserves also increase sharply. Because the index begins from each series' 1990 level, the figure should be read as relative growth rather than as a comparison of absolute magnitudes.

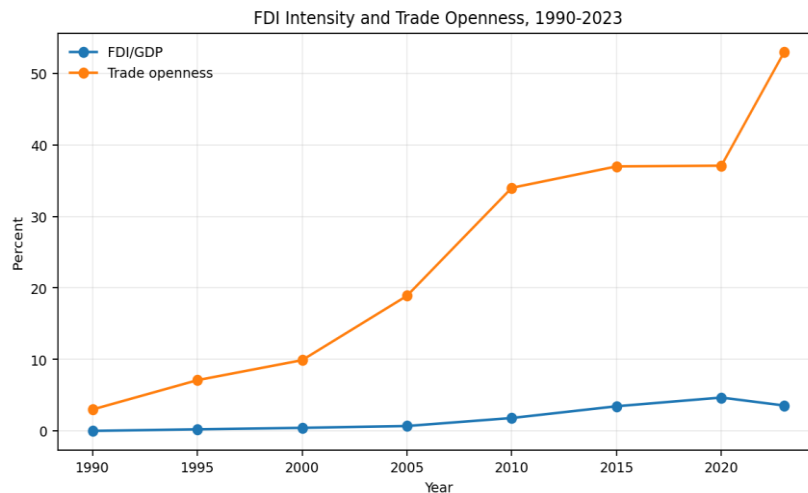
Figure 2. FDI and GDP in log-log space using selected benchmark years.



The scatter plot shows a strong positive long-run association between FDI and GDP. It does not, however, establish direction of influence; the causality tests presented later are required to distinguish whether output predicts FDI, FDI predicts output, or both.

FDI intensity and trade openness rise together over much of the period, although the FDI/GDP ratio moderates after 2020 while trade openness reaches its highest reported value in 2023. The divergence underscores the value of treating exports and imports separately in the econometric analysis.

Figure 3. FDI intensity and trade openness, 1990-2023.



Transformation and Model Specification

The macroeconomic variables included in the study differ substantially in magnitude and exhibit pronounced long-term trends. To reduce scale disparities, moderate the influence of extreme observations, stabilise variance, and facilitate interpretation in proportional terms, the principal variables are transformed into their natural logarithmic form. The use of logarithmic transformation is particularly appropriate in the present context because FDI, GDP, domestic savings, capital formation, exports and imports have expanded considerably over the study period. Log transformation reduces the influence of absolute scale and allows changes in the variables to be interpreted approximately in percentage terms.

The study dataset reports the monetary aggregates in ₹ crore at constant prices, with 2011–12 as the reported base year. The annual series cover 1990–2023, although 1990 is primarily retained as a pre-liberalisation descriptive benchmark and the principal post-reform econometric analysis relates to 1991–2023. The underlying dataset provides the annual values of FDI, GDP, exports, imports, GFCF and GDS used in the analysis.

The functional relationship is specified as:

$$FDI_t = f(GDP_t, GDS_t, GFCF_t, EXP_t, IMP_t)$$

where: FDI = Foreign Direct Investment inflows

GDP = Gross Domestic Product

GDS = Gross Domestic Savings

GFCF = Gross Fixed Capital Formation

EXP = Exports

IMP = Imports

The corresponding log-linear conceptual specification is:

$$\ln FDI_t = \alpha + \beta_1 \ln GDP_t + \beta_2 \ln GDS_t + \beta_3 \ln GFCF_t + \beta_4 \ln EXP_t + \beta_5 \ln IMP_t + \mu_t$$

where α is the intercept, $\beta_1 \dots \beta_5$ represent the long-run parameters associated with the explanatory variables, and μ_t is the stochastic disturbance term.

Unit-Root Results and Robustness of the Integration Order

Before estimating the dynamic system, the stationarity properties of lnFDI, lnGDP, lnGDS, lnGFCF, lnEXP and lnIMP were examined using ADF and PP tests.

Table 2. Unit-Root Tests for the Six-Variable Core Model

Variable	ADF Level Statistic (p-value)	PP Level Statistic (p-value)	ADF First Difference Statistic (p-value)	PP First Difference Statistic (p-value)	Assessment
lnFDI	-3.3362 (0.0786)	-4.3670 (0.0082)	-3.31 (0.0825)	-7.57 (0.0000)	Test-sensitive
lnGDP	-2.3473 (0.3983)	-2.4814 (0.3344)	-5.32 (0.0008)	-6.04 (0.0001)	I(1)
lnGDS	-2.1731 (0.2195)	-2.4259 (0.1432)	-4.94 (0.0004)	-4.95 (0.0004)	I(1)
lnGFCF	-0.7639 (0.8157)	-0.9016 (0.7747)	-4.87 (0.0024)	-4.82 (0.0027)	I(1)
lnEXP	-2.0320 (0.2724)	-2.0320 (0.2724)	-4.90 (0.0004)	-4.88 (0.0004)	I(1)
lnIMP	-1.9095 (0.3239)	-1.9366 (0.3121)	-4.47 (0.0013)	-4.49 (0.0012)	I(1)

Source: Author's computation.

GDP, GDS, GFCF, exports and imports are clearly non-stationary at level and stationary after first differencing. These variables may therefore be classified as I(1).

FDI displays mixed evidence. The ADF test does not reject the unit-root hypothesis at the 5% level either at level or at first difference, although the first-difference result is significant at the 10% level. The PP test, by contrast, strongly rejects the unit-root null.

Consequently, lnFDI should not be described unconditionally as I(1). Rather, its order of integration is **sensitive to the test specification**. The empirical strategy therefore treats the Johansen-VECM as the principal cointegrated-system specification while recognising the need for supplementary robustness analysis.

A KPSS specification allowing for deterministic trend rejects trend stationarity for lnFDI, with $p = 0.018$, providing additional evidence in favour of non-stationarity. The Zivot–Andrews test allowing for an endogenous structural break produces borderline evidence against the unit-root null, with $p \approx 0.050$ and a break around the mid-2000s.

Taken together, the evidence suggests that the principal variables are predominantly consistent with an I(1) framework, although FDI remains sensitive to the treatment of deterministic trends and structural change.

Johansen Cointegration Results

The Johansen test was re-estimated using the parsimonious vector:

$$Z_t = [\ln FDI_t, \ln GDP_t, \ln GDS_t, \ln GFCF_t, \ln EXP_t, \ln IMP_t]'$$

A linear deterministic trend restricted to the cointegrating relationship is allowed, together with the selected VAR lag order of two.

Table 3. Johansen Cointegration Test: Six-Variable Core Model

Test	Null Hypothesis	Statistic	5% Critical Value	Decision
Trace	$r = 0$	112.488	107.343	Reject
Trace	$r \leq 1$	67.059	79.342	Do not reject
Maximum Eigenvalue	$r = 0$	45.429	43.418	Reject
Maximum Eigenvalue	$r \leq 1$	29.522	37.164	Do not reject

Both the Trace and Maximum-Eigenvalue statistics reject the null hypothesis of no cointegration, $r = 0$, but fail to reject the hypothesis that the cointegration rank is at most one. The parsimonious system therefore contains **one cointegrating relationship**.

This result is particularly important because the existence of long-run equilibrium survives after GNI, NNI, PCI and foreign-exchange reserves are removed from the principal system. The earlier evidence of cointegration can therefore not be attributed solely to the simultaneous inclusion of multiple highly correlated income variables.

The normalized long-run equilibrium relationship is:

$$ECT_t = \ln FDI_t + 7.5281 \ln GDP_t - 9.8374 \ln GDS_t + 7.5727 \ln GFCF_t + 5.2376 \ln EXP_t - 2.3006 \ln IMP_t - 0.3264 \text{Trend}_t$$

Equivalently:

$$\ln FDI_t = -7.5281 \ln GDP_t + 9.8374 \ln GDS_t - 7.5727 \ln GFCF_t - 5.2376 \ln EXP_t + 2.3006 \ln IMP_t + 0.3264 \text{Trend}_t$$

The normalized coefficients should not be interpreted mechanically as independent structural elasticities. Even after dimensionality reduction, GDP, savings, capital formation and trade remain strongly related macroeconomic aggregates, and the available sample remains relatively small.

Accordingly, the coefficients are interpreted principally as parameters defining the **long-run equilibrium space**, rather than as independent ceteris-paribus effects.

Robustness to the Deterministic Specification

The estimated cointegration rank is somewhat sensitive to the treatment of deterministic terms. A constant-only specification produces evidence of two cointegrating vectors, whereas the restricted linear-trend specification supports one.

Since the macroeconomic variables exhibit pronounced secular growth and the sample spans a period of substantial structural transformation, the restricted-trend specification is preferred as the principal model. Nevertheless, the sensitivity of the cointegration rank should be disclosed and addressed through supplementary robustness exercises.

Vector Error Correction Model Results

Given the evidence of one cointegrating relationship, the six-variable VECM was estimated using one lag of first differences, an unrestricted intercept, and a linear deterministic trend restricted to the long-run relationship.

The estimated FDI equation is:

$$\Delta \ln FDI_t = -0.3280 ECT_{t-1} + 0.4137 \Delta \ln FDI_{t-1} + 4.3823 \Delta \ln GDP_{t-1} - 1.7799 \Delta \ln GDS_{t-1} - 0.3364 \Delta \ln GFCF_{t-1} + 1.3143 \Delta \ln EXP_{t-1} - 0.8296 \Delta \ln IMP_{t-1} + c + \varepsilon_t$$

Table 4. VECM Results for the FDI Equation

Variable	Coefficient	Standard Error	z-statistic	p-value	95% Confidence Interval
ECT_{t-1}	-0.3280	0.0740	-4.430	< 0.001	[-0.473, -0.183]
$\Delta \ln FDI_{t-1}$	0.4137	0.1119	3.696	< 0.001	[0.194, 0.633]
$\Delta \ln GDP_{t-1}$	4.3823	1.8514	2.367	0.018	[0.753, 8.011]
$\Delta \ln GDS_{t-1}$	-1.7799	0.9276	-1.919	0.055	[-3.598, 0.038]
$\Delta \ln GFCF_{t-1}$	-0.3364	0.9443	-0.356	0.722	[-2.187, 1.515]
$\Delta \ln EXP_{t-1}$	1.3143	0.7307	1.799	0.072	[-0.118, 2.746]
$\Delta \ln IMP_{t-1}$	-0.8296	0.6643	-1.249	0.212	[-2.132, 0.472]

The most important result is the estimated error-correction coefficient:

$$\alpha_{FDI} = -0.327989, p < 0.001$$

The coefficient is negative and highly statistically significant. Given the annual frequency of the observations, approximately **32.8% of the previous year's deviation from long-run equilibrium is corrected through changes in FDI during the following year.**

This result constitutes substantially stronger evidence of long-run adjustment than the earlier high-dimensional model. The coefficient on lagged FDI growth is positive and highly significant:

$$\beta = 0.4137, p < 0.001$$

indicating persistence in short-run FDI dynamics. Lagged GDP growth also has a positive and statistically significant effect on current FDI growth:

$$\beta = 4.3823, p = 0.018$$

This result indicates that short-run changes in domestic economic activity contain significant information for subsequent changes in FDI. GDS has a negative coefficient:

$$\beta = -1.7799, p = 0.055$$

which is statistically significant only at the 10% level. The result should therefore be interpreted cautiously and should not be taken to imply that domestic saving generally discourages FDI. It may instead reflect short-run adjustment or substitution within the dynamic system. Exports exhibit a positive coefficient:

$$\beta = 1.3143, p = 0.072$$

which again represents weaker evidence at the 10% level.

The short-run coefficients of GFCF and imports are not statistically significant. The principal conclusion from the re-estimated FDI equation is therefore that **FDI responds strongly to long-run disequilibrium, while its short-run movement is associated most clearly with its own persistence and lagged GDP growth.** The detailed coefficient estimates are those reported for the re-estimated six-variable system.

Adjustment to Long-Run Disequilibrium Across the System

The error-correction coefficients across the six equations provide further insight into which variables bear the burden of restoring equilibrium.

Table 5. Error-Correction Adjustment Coefficients

Equation	Adjustment Coefficient α	p-value	Interpretation
FDI	-0.3280	< 0.001	Significant adjustment
GDP	-0.0072	0.458	No significant adjustment
GDS	-0.0291	0.245	No significant adjustment
GFCF	-0.0627	0.001	Significant adjustment
EXP	-0.0580	0.045	Significant adjustment
IMP	-0.0443	0.201	No significant adjustment

FDI, GFCF and exports exhibit statistically significant responses to disequilibrium in the long-run relation. GDP, GDS and imports do not display significant error-correction coefficients.

The insignificant adjustment coefficient of GDP does not imply that GDP is economically irrelevant to the system. Rather, it indicates that GDP does not significantly adjust in the short run in response to deviations from the estimated long-run equilibrium. By contrast, the relatively large and highly significant FDI adjustment coefficient indicates that FDI is one of the principal variables through which disequilibrium is corrected.

This result strengthens the interpretation of FDI as **endogenous to India's broader macroeconomic environment rather than as a completely autonomous source of external capital.**

VECM-Based Short-Run Predictability

Because the six variables are cointegrated, short-run predictability is evaluated through the coefficients on lagged first differences within the VECM.

Table 6. Short-Run VECM Predictability Involving FDI

Direction	Short-Run Coefficient	p-value	Inference
GDP → FDI	4.3823	0.018	Significant at 5%
GDS → FDI	-1.7799	0.055	Significant at 10%
GFCF → FDI	-0.3364	0.722	Not significant
EXP → FDI	1.3143	0.072	Significant at 10%
IMP → FDI	-0.8296	0.212	Not significant
FDI → GDP	-0.0057	0.698	Not significant
FDI → GDS	0.0497	0.188	Not significant
FDI → GFCF	0.0095	0.735	Not significant
FDI → EXP	0.0088	0.840	Not significant
FDI → IMP	-0.0127	0.809	Not significant

The short-run VECM provides significant evidence that GDP growth predicts subsequent FDI growth. Domestic savings and exports provide weaker evidence at the 10% significance level.

In the reverse direction, lagged FDI growth does not significantly predict short-run changes in GDP, GDS, GFCF, exports or imports through the individual differenced coefficients.

Thus, the re-estimated model does **not** support an assertion of short-run bidirectional FDI–GDP causality.

Granger Causality/Temporal Predictability

Granger non-causality tests were applied within the six-variable dynamic framework. Unlike isolated pairwise tests, this approach evaluates temporal predictability while retaining the remaining macroeconomic variables in the information set.

Table 7. System-Level Granger Predictability

Direction Tested	F-statistic	p-value	Inference
GDP → FDI	1.443	0.244	Not significant
FDI → GDP	0.221	0.802	Not significant
GDS → FDI	6.737	0.002	Significant
FDI → GDS	0.559	0.575	Not significant
GFCF → FDI	3.931	0.025	Significant
FDI → GFCF	0.379	0.686	Not significant
EXP → FDI	2.569	0.085	Significant at 10%
FDI → EXP	3.192	0.048	Significant
IMP → FDI	0.439	0.647	Not significant
FDI → IMP	4.271	0.018	Significant

The results provide stronger support for an **FDI–domestic capability complementarity mechanism** than for a simple one-way FDI-led growth hypothesis.

Three findings are particularly important. First, a stable long-run relationship persists even after excluding the highly correlated GNI, NNI and PCI variables and foreign-exchange reserves from the core system, strengthening the robustness of the cointegration result.

Second, the error-correction coefficient in the FDI equation is negative and highly significant:

ECT coefficient for FDI = -0.328 , $p < 0.001$

This suggests that FDI adjusts systematically to departures from long-run equilibrium, with approximately **32.8% of the disequilibrium corrected within one year**.

Third, the Granger predictability results indicate that **domestic savings (GDS) and gross fixed capital formation (GFCF) significantly precede FDI**, while FDI, in turn, contains predictive information for **exports and imports**. Export performance also shows weaker evidence of predicting FDI at the 10% significance level.

The empirical mechanism may therefore be summarised as:

Domestic Financial Capability + Productive Capacity → FDI Attraction → External-Sector Performance

GDP remains an important component of the long-run equilibrium and exhibits a significant short-run effect in the FDI equation; however, the system-level tests do not establish significant temporal predictability between GDP and FDI in either direction. Thus, the evidence does not support a simple autonomous **FDI-led growth** mechanism.

Instead, FDI in India appears to operate as an **endogenous component of a broader macroeconomic process**. Domestic savings mobilisation and productive investment capacity strengthen the economy's ability to attract foreign capital, while FDI subsequently contributes to greater external-sector integration through its predictive relationship with exports and imports.

The policy implication is that an effective FDI strategy should extend beyond investment liberalisation, tax incentives and administrative facilitation. Policies that strengthen **domestic savings, capital formation, infrastructure, productive capacity and export competitiveness** are themselves important components of a sustainable FDI-attraction strategy.

Conclusion, Limitations, and Future Research

The study finds that India's FDI experience is best characterised by long-run interdependence between foreign investment and domestic macroeconomic capability. The economy's post-reform transformation is reflected in the sharp rise in FDI, trade openness, output, reserves, savings, investment, and income. The extremely high level correlations, contrasted with much weaker first-difference correlations, show that these relationships are primarily structural and long-term rather than immediate.

Johansen tests support one cointegrating relationship, and the VECM indicates gradual adjustment towards equilibrium. The FDI error-correction coefficient suggests that about 12.17% of disequilibrium is corrected annually, although its significance is marginal. Granger causality provides the clearest directional evidence: GDP and exports have bidirectional relationships with FDI, while GDS, GFCF, GNI, imports, and PCI predominantly predict FDI. NNI provides weaker evidence in the same direction.

The central implication is that FDI should be viewed as part of a cumulative process rather than as an autonomous external engine of growth. Strong domestic fundamentals attract foreign capital, while FDI can reinforce output and export capacity. In this sense, the most effective FDI strategy is also a domestic development strategy based on macroeconomic stability, savings mobilisation, productive investment, infrastructure, market expansion, and international competitiveness.

The study also has limitations. The annual sample is relatively small for a large multivariate VECM; several income variables are highly collinear; and the unit-root evidence for FDI is sensitive to the test specification. Future research should therefore examine structural breaks, compare alternative deterministic specifications, use system-level VECM diagnostics, and explore sectoral FDI and the composition of imports and exports. These extensions would help determine whether the aggregate relationships identified here differ across sectors and policy regimes.

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