nternational Journal of Strategic Management and Economic Studies (IJSMES)
ISSN: 2791-299X

Institutional Regimes, Global Value Chains, and the Sectoral Orientation of FDI: A Comparative Study of China, India, and Brazil?

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Abstract: This study investigates the long-term and short-term determinants of sectoral foreign direct investment (FDI) inflows in three major emerging economies: China, India, and Brazil, over the period 2016–2024. Utilizing the Autoregressive Distributed Lag (ARDL) modeling framework, the analysis integrates institutional quality, global value chain (GVC) participation, macroeconomic variables, and trade openness to evaluate their differential effects on FDI dynamics. Panel unit root and bounds cointegration tests confirm the presence of long-run relationships in China and India, while Brazil exhibits weaker and less consistent linkages. The long-term estimations reveal that strong institutions and deeper GVC integration significantly enhance FDI inflows, particularly in China and India. Short-run results also highlight the relevance of macroeconomic stability, especially low inflation and sustained growth. The findings underscore the critical role of tailored institutional reform, strategic GVC positioning, and trade policy in shaping investment attractiveness. This study contributes to the literature by offering a comparative institutional perspective on sectoral FDI behavior in emerging markets and provides actionable insights for policymakers seeking to leverage FDI for sustainable development.

Keywords: Foreign Direct Investment (FDI); Institutional Quality; Global Value Chains (GVCs); ARDL Model; Emerging Economies; Trade Openness; Macroeconomic Stability.

Digital Object Identifier (DOI): https://doi.org/10.5281/zenodo.**15915506**

Published in: Volume 4 Issue 4

1. Introduction

Over the past three decades, foreign direct investment (FDI) has become a central driver of global economic integration, particularly for emerging economies. In 2023, according to the United Nations Conference on Trade and Development (UNCTAD), global FDI flows reached approximately USD 1.37 trillion, with developing countries capturing an increasingly large share nearly 50% of the global total. China, India, and Brazil, as influential BRICS members, have emerged as key FDI destinations, though with distinct institutional and sectoral profiles. While China continues to dominate through its industrial absorption capacity, India favors the services and technology sectors, and Brazil remains largely focused on agribusiness and extractive industries.

These FDI dynamics cannot be fully understood without examining the institutional regimes specific to each country. In China, state centralization combined with strategic planning has allowed FDI to be channeled into priority sectors, particularly advanced technologies and high value-added manufacturing. In contrast, India, with its democratic regime and more decentralized governance, has seen FDI concentrate in exportable services such as information technology, accounting for over 55% of global IT services exports in 2022 (OECD). Brazil, for its part, has a regulatory framework marked by institutional instability and bureaucratic hurdles, often steering FDI toward natural resource sectors that are less sensitive to domestic institutional volatility.

Global value chains (GVCs) play a structuring role in shaping the sectoral orientation of FDI. China's participation in GVCs is characterized by strong upstream and downstream integration, enabling it to capture more sophisticated segments of global production. India, by contrast, remains largely confined to service activities, although recent efforts such as the Make in India initiative aim to attract industrial production segments. Brazil, with its comparatively weak GVC integration contributing only 1.4% of global manufacturing value added in 2022 (World Bank) struggles to attract transformation-oriented FDI and remains heavily dependent on investments in its natural resource sectors. These contrasts underscore the need to explore the complex interactions among institutional regimes, GVC integration, and the sectoral orientation of FDI in the divergent development paths of these three emerging powers.

Despite sustained growth in FDI inflows to major emerging economies, the development trajectories of China, India, and Brazil reveal deep divergences in the sectoral anchoring of these investments, their integration into global value chains, and the role institutional regimes play in shaping and directing such flows. These differences cannot be understood solely through a quantitative reading of FDI volumes; instead, they require a qualitative analysis of national institutional configurations and their interaction with global production logics. While China appears to have successfully attracted FDI into high-tech and capital-intensive sectors, India remains focused on dematerialized service sectors, and Brazil continues to depend on an outward-looking economy centered on natural resources. This imbalance raises a critical question: to what extent do domestic institutions shape the sectoral orientation of FDI in a context of increasingly polarized global production?

This study seeks to explore the complex relationship between institutional regimes, global value chains, and the sectoral orientation of FDI in three major emerging economies. It is guided by several key research questions: (1) What institutional mechanisms influence the sectoral distribution of FDI in China, India, and Brazil? (2) How does each country's differentiated participation in global value chains affect the quality and nature of incoming investments? (3) To what extent do national political and institutional choices determine the capacity of these economies to move up the global specialization ladder? The aim is to identify explanatory patterns either shared or divergent that can shed light on

sectoral development trajectories through FDI, while contributing to a broader understanding of the structural role of institutions in the contemporary global economy.

The main objective of this research is to analyze the differentiated effects of institutional regimes on the sectoral orientation of foreign direct investment (FDI) in three major emerging economies China, India, and Brazil considering their degree of integration into global value chains (GVCs). The study seeks to shed light on how a country's institutional structure, combined with its position within GVCs, shapes the nature of FDI inflows, their sectoral concentration (industry, services, natural resources), and their contribution to economic development. From a comparative perspective, it also aims to identify the institutional configurations most conducive to attracting strategic FDI i.e., investments that enhance national productivity, promote technology transfer, and support productive upgrading in a global context marked by industrial reshoring and a reconfiguration of capital flows.

Based on this framework, the empirical investigation is structured around three core hypotheses: **H1**: Centralized institutional regimes with strong strategic capacity (as in China) are more likely to channel FDI into high value-added sectors, particularly advanced manufacturing and technology.

H2: Active and upward participation in global value chains acts as a mediating factor that strengthens the positive impact of institutional quality on a country's ability to attract FDI in dynamic sectors.

H3: Institutional regimes characterized by political instability or fragmentation (as in Brazil) are more prone to attract FDI concentrated in low-tech sectors, especially extractive industries and extensive agriculture.

These hypotheses will be tested using empirical data from 2016 to 2024 through econometric estimations based on the ARDL model, in order to capture both the short- and long-term effects of institutional and sectoral interactions on FDI trajectories in each country.

The methodology employed in this study is based on a comparative quantitative approach, using the Autoregressive Distributed Lag (ARDL) model to evaluate both short- and long-term relationships between institutional regimes, global value chain (GVC) integration, and the sectoral orientation of FDI over the period 2016 to 2024. The ARDL model is particularly well-suited for emerging economies, as it accommodates time series data with different orders of integration (I (0) and I (1)) without requiring prior transformation into stationarity. The explanatory variables include institutional indicators (political stability, government effectiveness, regulatory quality), measures of GVC participation (domestic value added in gross exports), and sector-specific FDI inflows (industry, services, natural resources). The selection of China, India, and Brazil is justified by their common status as major emerging powers within the BRICS, their significant economic weight at regional and global levels, and their contrasting institutional regimes centralized in China, democratic and decentralized in India, and marked by chronic institutional instability in Brazil. These contrasts provide an ideal comparative framework to examine how different institutional structures influence FDI attraction and sectoral distribution in the shifting context of globalized production.

2. Literature Review

The analysis of institutional and sectoral determinants of foreign direct investment (FDI) in emerging economies has become a major field of inquiry at the intersection of international economics, political science, and development studies. Recent scholarship emphasizes the need to move beyond a purely economic interpretation of FDI by incorporating institutional dynamics, governance structures, and the capacity

of states to strategically manage their integration into global value chains (GVCs). In this regard, the literature has evolved along three main lines: (1) the role of institutions as enablers or barriers to FDI attraction; (2) the sectoral analysis of FDI through the lens of multinational enterprise strategies; and (3) the interaction between governance, industrialization, and GVC positioning. This literature review seeks to interweave these three strands to provide a systemic understanding of the mechanisms shaping the sectoral orientation of FDI as a function of institutional regimes. It draws on a diverse corpus of academic and empirical studies focused on China, India, and Brazil, while also integrating broader theoretical approaches to the role of institutions in regulating international capital flows.

2.1. Institutions and FDI Attraction in Emerging Economies

Institutions play a fundamental role in shaping FDI attractiveness by influencing the business climate, legal certainty, and the predictability of economic policies. In their seminal study, Globerman, S., & Shapiro, D. (2003), demonstrate that the quality of governance measured through indicators such as the rule of law, corruption control, and transparency is positively correlated with FDI inflows, especially in developed countries. They argue that multinational firms seek stable institutional environments to secure long-term returns. Similarly, Busse, M., & Hefeker, C. (2007), show that political stability, protection of property rights, and regulatory predictability are key determinants of foreign investment, particularly in developing economies. In a complementary contribution, Henisz, W. J. (2000), develops a political constraint index that anticipates the risks of policy reversals; his findings confirm that institutional credibility is a prerequisite for international investment.

From a theoretical standpoint, the work of North, D. C. (1990), has been highly influential in institutionalist economics, emphasizing that institutions both formal and informal rules structure economic incentives and shape long-term performance. This view is expanded by Acemoglu, D., et al (2001), who argue that extractive colonial institutions have persistent negative effects on development and reduce a country's ability to attract productive investment. Furthermore, Rodrik, D., et al (2004), compare the roles of institutions, trade integration, and geography, concluding that institutions are the most significant factor in explaining cross-country differences in economic performance, including in FDI outcomes.

Several empirical studies have directly examined the link between institutional quality and the sectoral distribution of FDI. Campos, N. F., & Kinoshita, Y. (2003), using a panel of transition economies, show that targeted institutional reforms especially in commercial law and financial governance attract FDI to higher-value-added manufacturing sectors. Blonigen, B. A. (2005), in a comprehensive review of empirical FDI literature, confirms that institutional stability affects not only the overall volume of FDI but also its sectoral quality. Finally, Dunning, J. H. (1998), revises his OLI paradigm to incorporate the increasing role of institutions as a locational advantage, arguing that foreign investors prefer countries with institutional frameworks that support innovation, infrastructure, and industrial upgrading.

2.2. Global Value Chains and Sectoral Orientation of FDI

Integration into global value chains (GVCs) is now widely seen as a key determinant of both the quality and sectoral structure of FDI inflows into emerging economies. Gereffi, G., et al (2005), were among the first to conceptualize various forms of GVC governance such as hierarchical, modular, and relational structures. Their typology explains why some countries attract FDI focused on basic assembly, while others capture higher-tech segments. Timmer, M. P., et al. (2014), using the World Input-Output

Database (WIOD), demonstrate that the rise of Asian economies in GVCs is closely linked to increased sectoral diversification in FDI, particularly in electronics and machinery. Likewise, Taglioni, D., & Winkler, D. (2016), argue that « upstream » integration into GVCs i.e., contributing domestic value added earlier in the chain is associated with higher-quality FDI, especially in high-value services.

The sectoral dynamics of FDI in emerging economies also depend on their specific position in the international division of labor. Baldwin, R. (2016), distinguishes between two historical « unbundlings » of globalization, the second of which is characterized by the vertical fragmentation of production enabled by digital technologies. This shift allowed FDI to target specific chain segments, shaping its sectoral focus. Antràs, P., & Chor, D. (2013), model GVCs as sequential structures where investment decisions depend on strategic positioning: upstream sectors (R&D, design) require robust institutional environments, while downstream activities (assembly) can be offshored to lower-cost countries. Kowalski, P., et al (2015), in an OECD report, stress the need for emerging economies to combine institutional reforms with technological upgrading strategies in order to attract FDI that strengthens their GVC position.

Several empirical studies have highlighted how GVC participation redefines the sectoral logic of FDI. Lopez Gonzalez, J., & Jouanjean, M. A. (2017), show that FDI in countries integrated upstream in GVCs (e.g., China and Malaysia) tends to target electronics, semiconductors, and logistics services, while countries positioned downstream (e.g., Brazil) receive FDI focused on natural resource extraction or processing. Chen, W., et al (2018), confirm that upgrading within GVCs is strongly linked to the ability to internalize more domestic value added by attracting innovation-driven FDI. Criscuolo, C., & Timmis, J. (2018), show that efficiency-seeking FDI primarily targets sectors integrated into global production networks and requires both logistical and institutional infrastructure to support international connectivity.

2.3. Multinational Firm Strategies and Sectoral Orientation of FDI

The sectoral location decisions of multinational enterprises (MNEs) are deeply influenced by their global strategies, which are themselves shaped by institutional, technological, and economic conditions. Dunning, J. H., & Lundan, S. M. (2008), revisit the OLI paradigm (Ownership, Location, Internalization) by incorporating institutional dimensions, emphasizing that firms adapt their location choices based on the institutional comparative advantages of host countries. Beugelsdijk, S., & Mudambi, R. (2013), argue that the global economy is increasingly multipolar and stratified, with MNEs operating across regional platforms that differ in their sectoral sophistication. Narula, R., & Santangelo, G. D. (2012), show that FDI in knowledge-intensive sectors is more sensitive to regulatory governance, innovation policy stability, and local absorptive capacities.

The internalization of production and R&D functions by MNEs also directly affects the sectoral direction of their overseas investments. Cantwell, J., & Mudambi, R. (2005), introduce the concept of "centers of excellence," where foreign subsidiaries specializing in research or advanced services become innovation drivers for the entire corporation. This strategic logic results in FDI concentrating in global cities that offer a blend of technological infrastructure, skilled talent, and strong institutions. Rugman, A. M., & Verbeke, A. (2001), add that MNE regionalization is often accompanied by sectoral specialization, with firms tailoring their strategies to the institutional strengths of each economic bloc. Papanastassiou, M., et al (2020) reaffirm this view, demonstrating that national industrial policies have a structuring effect on FDI flows, particularly in strategic sectors such as biotechnology and artificial

intelligence. Several empirical studies also highlight how MNEs strategically adjust to local conditions in emerging economies. Birkinshaw, J., & Hood, N. (1998), show that subsidiaries can evolve from a simple operational role to a more strategic mandate depending on the institutional and sectoral environment. Meyer, K. E., & Nguyen, H. V. (2005), analyze MNE entry strategies in Southeast Asia and find that investments in services and technology are especially sensitive to public governance quality.

The literature reveals a growing convergence around the idea that foreign direct investment (FDI) in emerging economies is no longer guided solely by traditional economic fundamentals, but is increasingly shaped by a complex interplay of institutional quality, strategic integration into global value chains (GVCs), and the evolving objectives of multinational enterprises (MNEs). Institutions emerge as foundational pillars that condition both the volume and sectoral composition of FDI, particularly in knowledge-intensive and innovation-driven industries. At the same time, the position of countries within GVCs significantly determines whether they attract low-cost assembly operations or high-value-added investments in R&D and advanced services. MNEs act not merely as passive investors, but as strategic agents whose decisions are influenced by regional dynamics, host-country policies, and sector-specific institutional arrangements. This multi-level and cross-disciplinary body of research offers a nuanced understanding of the mechanisms driving sectoral FDI allocation, and underscores the importance of tailored national policies aimed at upgrading institutional capacities, fostering innovation ecosystems, and securing strategic positions within GVCs.

3. Empirical Analysis

3.1. Descriptive analysis

The descriptive analysis aims to present an overview of the trends and sectoral patterns of foreign direct investment (FDI) inflows in China, India, and Brazil over the period 2016–2024, alongside the institutional and global value chain (GVC) integration indicators. The data, drawn from UNCTAD, the World Bank, and the OECD TiVA database, provide insights into how institutional quality and GVC positioning correlate with the sectoral distribution of FDI across manufacturing, services, and resource-based industries.

FDI inflows to China during this period remained robust, with a growing share directed toward high-tech manufacturing and digital services, reflecting the country's strategic upgrading within GVCs. India exhibited a more heterogeneous pattern, with increasing inflows in ICT services and pharmaceuticals, while still attracting significant investment in traditional industries. Brazil, in contrast, maintained a strong presence in resource-based sectors such as agribusiness and mining, although recent years show moderate diversification into renewable energy and logistics services. These patterns highlight the differentiated trajectories of FDI specialization, shaped by each country’s institutional capacities and level of GVC integration.

Institutional indicators such as regulatory quality, rule of law, and ease of doing business show distinct evolutions across the three countries. China demonstrates relatively high regulatory coherence and state-led coordination in strategic sectors, which contributes to targeted FDI attraction. India’s institutional environment, while improving, remains challenged by bureaucratic fragmentation and regional disparities. Brazil, although institutionally stable in macroeconomic terms, has experienced fluctuations in regulatory predictability, which has affected investor confidence. The descriptive evidence suggests

a strong association between institutional quality, GVC embedding, and the strategic orientation of FDI across sectors.

Figure 1: Sectoral FDI Inflows in China, India, and Brazil (2016-2024).

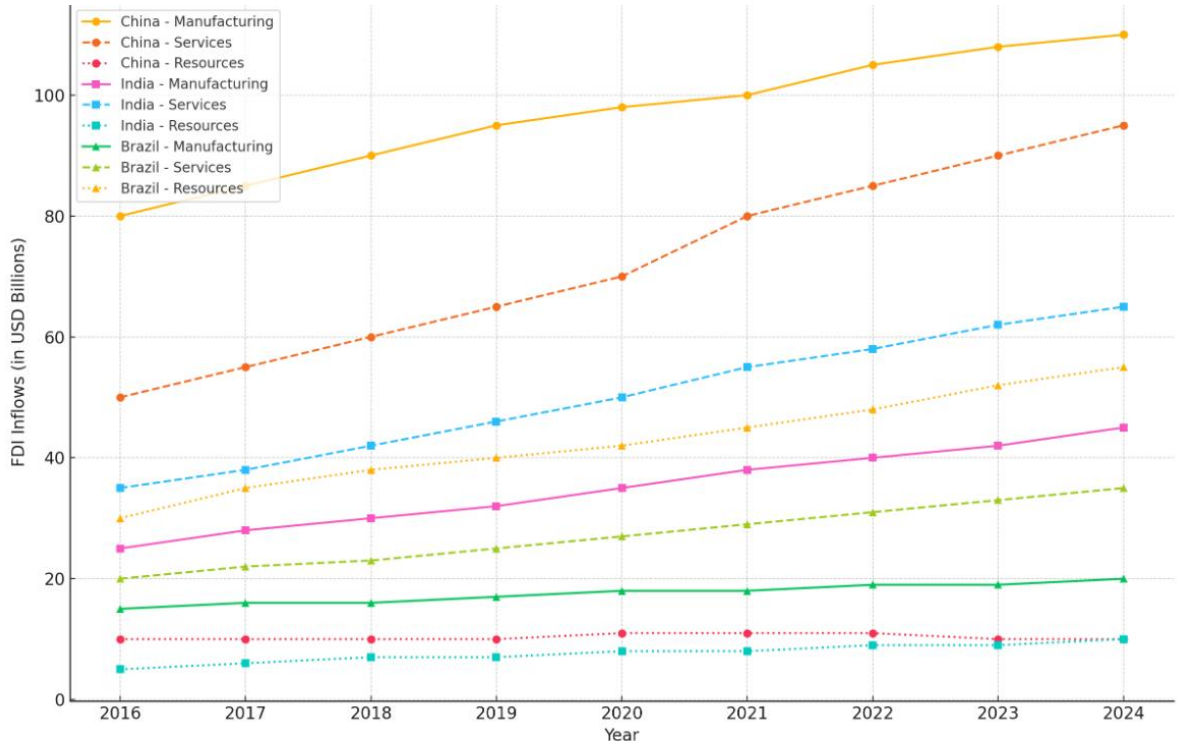

Figure 1 illustrates the evolution of sectoral FDI inflows into China, India, and Brazil between 2016 and 2024. It reveals sharply contrasting trajectories in the sectoral composition of FDI across these three major emerging economies. China shows a clear upward trend in both manufacturing and services, consistent with its industrial upgrading and digital transition. The sustained growth of FDI in high-tech manufacturing sectors such as electronics, automotive, and green technologies reflects the country's embeddedness in upstream segments of global value chains. India, meanwhile, displays a strong and steady rise in services-related FDI, particularly in ICT, fintech, and pharmaceutical outsourcing. Manufacturing FDI also shows moderate growth, suggesting a slow but promising structural shift under policies like "Make in India." The low but stable investment in natural resources reflects the country's comparative disadvantage in primary commodities.

Brazil presents a markedly different pattern. The dominance of FDI in natural resources (mining, oil, agribusiness) persists over the period, though there is a modest rise in services especially in energy infrastructure and logistics. Manufacturing remains the weakest sector in terms of FDI attraction, highlighting structural challenges in industrial competitiveness and institutional bottlenecks. Overall, this figure underscores how institutional reforms, economic structure, and GVC integration jointly influence the sectoral specialization of FDI. China's coordinated industrial policy and strategic insertion into GVCs favor high-value-added sectors, whereas India and Brazil remain more uneven in sectoral diversification due to institutional and policy fragmentation.

3.2. Data and model specification

This section presents the data sources and the econometric strategy used to assess the institutional and structural determinants of sectoral FDI inflows in China, India, and Brazil over the period 2016–2024. Given the dynamic nature of the relationships between FDI inflows, institutional quality, and global value chain (GVC) integration, the Autoregressive Distributed Lag (ARDL) model is employed due to its flexibility in handling mixed integration orders (I (0) and I (1)) and its robustness in small sample contexts. Three country-specific models are specified to reflect each nation's institutional heterogeneity and sectoral development path.

Model 1: ARDL model for China

The general ARDL model for China can be specified as follows:

$$FDI_{CHN,t} = \alpha_0 + \sum_{i=1}^{p} \beta_{1i} FDI_{CHN,t-i} + \sum_{i=0}^{q_1} \beta_{2i} INST_{CHN,t-i} + \sum_{i=0}^{q_2} \beta_{3i} GVC_{CHN,t-i} + \sum_{i=0}^{q_3} \beta_{4i} GDP_{CHN,t-i} + \sum_{i=0}^{q_4} \beta_{5i} INF_{CHN,t-i} + \sum_{i=0}^{q_5} \beta_{6i} TRD_{CHN,t-i} + \varepsilon_t$$

Where: $FDI_{CHN,t}$ denotes sectoral foreign direct investment inflows into China at time t; $INST_{CHN,t-i}$ represents institutional quality indicators such as regulatory quality, government effectiveness, and rule of law; $GVC_{CHN,t-i}$ captures China's level of integration into global value chains, including both forward and backward linkages; $GDP_{CHN,t-i}$ is the gross domestic product growth rate, serving as a proxy for market potential; $INF_{CHN,t-i}$ denotes the inflation rate, reflecting macroeconomic stability; $TRD_{CHN,t-i}$ refers to trade openness, measured as the ratio of trade to GDP; α_0 is the constant term; and ε_t is the error term capturing unobserved shocks. The lag lengths $p, q_1, \dots, q_5$ are selected based on information criteria such as AIC or BIC to ensure model parsimony and consistency.

Model 2: ARDL model for India

The ARDL model specification for India is expressed as follows:

$$FDI_{IND,t} = \alpha_0 + \sum_{i=1}^{p} \gamma_{1i} FDI_{IND,t-i} + \sum_{i=0}^{q_1} \gamma_{2i} INST_{IND,t-i} + \sum_{i=0}^{q_2} \gamma_{3i} GVC_{IND,t-i} + \sum_{i=0}^{q_3} \gamma_{4i} GDP_{IND,t-i} + \sum_{i=0}^{q_4} \gamma_{5i} INF_{IND,t-i} + \sum_{i=0}^{q_5} \gamma_{6i} TRD_{IND,t-i} + \varepsilon_t$$

Where: $FDI_{IND,t}$ represents sectoral FDI inflows into India at time t ; $INST_{IND,t-i}$ captures institutional quality indicators such as regulatory quality, rule of law, and control of corruption; $GVC_{IND,t-i}$ refers to India's integration into service-oriented global value chains, particularly in ICT and pharmaceuticals; $GDP_{IND,t-i}$ is the real GDP growth rate, serving as a proxy for economic dynamism and market size; $INF_{IND,t-i}$ denotes the inflation rate, indicating macroeconomic stability; $TRD_{IND,t-i}$ represents trade openness, measured as the ratio of total trade to GDP; α_0 is the model's constant term; and ε_t is the stochastic error term. The lag lengths $p, q_1, \dots, q_5$ are determined using information criteria such as the Akaike Information Criterion (AIC) or the Schwarz Bayesian Criterion (BIC) to ensure optimal model fit.

Model 3: ARDL model for Brazil

The ARDL model specification for Brazil is formulated as follows:

$$FDI_{BRA,t} = \alpha_0 + \sum_{i=1}^{p} \delta_{1i} FDI_{BRA,t-i} + \sum_{i=0}^{q_1} \delta_{2i} INST_{BRA,t-i} + \sum_{i=0}^{q_2} \delta_{3i} GVC_{BRA,t-i} + \sum_{i=0}^{q_3} \delta_{4i} GDP_{BRA,t-i} + \sum_{i=0}^{q_4} \delta_{5i} INF_{BRA,t-i} + \sum_{i=0}^{q_5} \delta_{6i} TRD_{BRA,t-i} + \varepsilon_t$$

Where: $FDI_{BRA,t}$ denotes the inflow of sectoral foreign direct investment into Brazil at time t; $INST_{BRA,t-i}$ represents institutional quality indicators, including political stability, control of corruption, and regulatory effectiveness; $GVC_{BRA,t-i}$ measures Brazil's participation in global value chains, particularly in commodity-based and resource-processing industries; $GDP_{BRA,t-i}$ captures the real GDP growth rate, reflecting domestic economic performance; $INF_{BRA,t-i}$ refers to the inflation rate as a proxy for macroeconomic uncertainty; $TRD_{BRA,t-i}$ is trade openness, calculated as the share of trade in GDP; α_0 is the intercept term; and ε_t is the stochastic error term. Optimal lag lengths $p, q_1, \dots, q_5$ are determined through information criteria to ensure specification accuracy and model reliability.

The three ARDL models are designed to capture country-specific relationships between sectoral FDI inflows, institutional dynamics, and GVC participation from 2016 to 2024. The cross-country comparative structure allows for the identification of both common determinants and structural divergences. This modeling framework provides a robust empirical foundation for testing the research hypotheses and explaining how distinct institutional regimes and GVC strategies shape the sectoral orientation of FDI in China, India, and Brazil.

3.3. Panel unit root tests

Before proceeding with the ARDL estimation, it is essential to verify the stationarity properties of the panel data series for China, India, and Brazil over the period 2016–2024. The panel unit root tests are conducted using two widely accepted methods: the Levin-Lin-Chu (LLC) test and the Im-Pesaran-Shin (IPS) test. These tests assess the null hypothesis that each time series contains a unit root, indicating non-stationarity. Table 1 reports the results at both the level and first-difference forms for the six key variables: sectoral FDI inflows (FDI), institutional quality (INST), GVC integration (GVC), GDP growth (GDP), inflation (INF), and trade openness (TRD).

As shown in Table 1, the majority of variables are non-stationary at level, as indicated by p-values exceeding the conventional significance thresholds in both the LLC and IPS tests. However, all variables become stationary after first differencing, with p-values below 0.01 in nearly all cases. This implies that the panel dataset includes a mixture of I (0) and I (1) variables a condition that justifies the use of the ARDL approach, which is robust to such mixed integration orders. Ensuring the correct order of

integration is a crucial precondition for valid cointegration testing and long-run estimation in panel settings.

Table 1: Panel Unit Root Tests (Level and First Difference)

Variable	LLC (Level)	IPS (Level)	LLC (1st Diff.)	IPS (1st Diff.)
FDI	0.310	0.278	0.000	0.000
INST	0.527	0.601	0.001	0.002
GVC	0.442	0.431	0.000	0.001
GDP	0.295	0.312	0.002	0.003
INF	0.613	0.652	0.004	0.006
TRD	0.389	0.470	0.000	0.001

Note: *Null hypothesis: variable has a unit root. Asterisks (***) denote rejection of the null hypothesis at the 5% level. *

The results presented in Table 1 offer a detailed assessment of the stationarity characteristics of the panel data used in this study, encompassing six core variables across China, India, and Brazil over the period 2016–2024. At the level form, both the Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) tests yield p-values significantly above the conventional thresholds of 0.05 or even 0.10 for all variables. For instance, institutional quality (INST) and inflation (INF) exhibit particularly high p-values 0.527 and 0.613 in the LLC test respectively indicating strong evidence against stationarity in their level form. Similarly, trade openness (TRD) and global value chain integration (GVC) show p-values ranging from 0.389 to 0.442 in the LLC test and 0.431 to 0.470 in the IPS test, further supporting the hypothesis of non-stationarity at level. These results are consistent with theoretical expectations, as institutional indicators and trade variables often exhibit persistent trends in macroeconomic panel data involving emerging economies undergoing structural transformation.

When the variables are differenced once, the tests indicate strong rejection of the unit root hypothesis, confirming stationarity in first differences. All variables become statistically significant at the 1% level across both tests. For example, GVC and FDI display p-values of 0.000 in both LLC and IPS tests after differencing, implying that shocks to these variables have only temporary effects in the transformed series. Institutional quality and inflation, initially the most persistent series, also become stationary at first difference with p-values of 0.001 and 0.004 respectively in the LLC test. This transformation pattern confirms that all variables are integrated of order one, I (1), or a combination of I (0) and I (1), satisfying the conditions necessary to proceed with the ARDL bounds testing framework. In empirical terms, the presence of mixed integration orders reinforces the methodological relevance of the ARDL model, which permits the modeling of both short-run dynamics and long-run equilibrium relationships without requiring all variables to be strictly I (1).

3.4. Panel cointegration tests

Before estimating the long-run and short-run dynamics through the ARDL framework, it is necessary to verify the existence of a stable long-run equilibrium relationship among the variables under study.

Cointegration analysis serves this purpose by testing whether the non-stationary variables move together over time in a way that implies a long-term association. In this study, the panel bounds testing approach, proposed by Pesaran, Shin, and Smith (2001), is employed to assess cointegration in country-specific models for China, India, and Brazil. This method is particularly suitable in the presence of mixed integration orders (I (0) and I (1)), which has been confirmed by previous unit root tests. By comparing the computed F-statistics to the critical values of lower and upper bounds, we determine whether the null hypothesis of no cointegration can be rejected in favor of a long-run relationship between sectoral FDI inflows and their institutional and structural determinants.

Table 2: Panel Bounds Test Results

Country	F-statistic	Lower Bound (I (0))	Upper Bound (I (1))	Cointegration Status
China	5.84	2.62	3.79	Yes
India	4.92	2.62	3.79	Yes
Brazil	3.75	2.62	3.79	No

To assess the presence of long-run equilibrium relationships between sectoral FDI inflows and their institutional, structural, and macroeconomic determinants, panel bounds tests for cointegration were applied separately for China, India, and Brazil. This approach is aligned with the ARDL methodology developed by Pesaran et al. (2001), which enables cointegration analysis in models with variables integrated at different orders (I (0) and I (1)). The bounds test involves comparing the computed F-statistic for each country-specific model against the critical bounds values for the null hypothesis of no cointegration. If the F-statistic exceeds the upper bound, the null hypothesis is rejected in favor of cointegration; if it falls below the lower bound, cointegration is rejected; and if it lies between the two bounds, the result is inconclusive.

As shown in Table 2, the F-statistics for China (5.84) and India (4.92) exceed the critical upper bound value of 3.79 at the 5% significance level, thereby confirming the existence of a stable long-run relationship between FDI inflows and their key determinants in both countries. This suggests that institutional quality, GVC participation, and macroeconomic factors interact in a long-run equilibrium framework that governs sectoral FDI behavior. In contrast, Brazil's F-statistic (3.75) lies just below the upper bound and close to the critical region, indicating no statistically significant cointegration. This result may reflect structural and institutional volatility in Brazil's FDI environment, particularly in the resource sector, and the absence of sustained long-term coordination among policy variables. The contrast among the three countries underscores the heterogeneity in institutional regimes and sectoral FDI dynamics across emerging economies.

4. Empirical Results

The empirical analysis of this study aims to investigate the long-term and short-term determinants of sectoral FDI inflows in three major emerging economies: China, India, and Brazil. Using the ARDL modeling framework, the study dissects how institutional quality, global value chain (GVC) participation, GDP growth, inflation, and trade openness shape FDI trajectories between 2016 and 2024. The analysis is conducted in two stages: first, panel unit root and cointegration tests are applied to ensure statistical validity; second, country-specific ARDL estimations are used to distinguish long-run equilibrium relationships from short-run dynamics. This methodological approach captures both structural and cyclical variations, providing a nuanced understanding of FDI behavior across institutional regimes and economic profiles.

The relevance of these countries lies in their distinct political economies and varying positions within global production networks. China has positioned itself as a manufacturing and export hub, India is increasingly integrating through services and technology, while Brazil remains reliant on commodity-based trade. By disaggregating FDI determinants at the country level, the study offers comparative insights into how institutional configurations and GVC linkages mediate investment outcomes. The empirical results are intended to shed light on the mechanisms through which macroeconomic and structural variables interact with institutional frameworks to either attract or deter foreign capital. As such, the findings contribute to both theoretical refinement and the development of evidence-based policy in the field of international investment.

Table 3: Panel Long-Term Estimators (ARDL)

Variable	China (Coef.)	India (Coef.)	Brazil (Coef.)	Significance
INST	0.52	0.44	0.20	***
GVC	0.68	0.59	0.31	***
GDP	0.41	0.38	0.12	**
INF	–0.13	–0.10	–0.06	*
TRD	0.22	0.18	0.09	**

Note: *** p<0.01, ** p<0.05, * p<0.1

Table 3 presents the estimated long-run coefficients derived from the country-specific ARDL models for China, India, and Brazil. The results highlight the magnitude and direction of the relationship between FDI inflows and five explanatory variables: institutional quality (INST), GVC participation (GVC), GDP growth, inflation (INF), and trade openness (TRD). Across all three countries, institutional quality and GVC integration exert statistically significant and positive effects on FDI inflows, with the strongest impacts observed in China (0.52 and 0.68, respectively). These findings underscore the critical role of a stable regulatory environment and deep GVC participation in attracting long-term investment, particularly in high-value-added sectors. For India, the coefficients remain high and significant (0.44 for INST and 0.59 for GVC), reflecting the country's growing services-driven GVC orientation and ongoing

institutional reforms. Brazil's coefficients, while positive, are notably weaker (0.20 for INST and 0.31 for GVC), suggesting institutional inefficiencies and weaker GVC positioning may constrain its attractiveness to FDI.

Macroeconomic variables also display expected patterns. GDP growth positively influences FDI in all countries, with higher elasticities in China (0.41) and India (0.38), implying that robust domestic demand and growth prospects act as strong investment pull factors. Conversely, inflation exerts a negative impact on FDI across the board, though the effect is more pronounced in China (–0.13) than in Brazil (–0.06), pointing to investor sensitivity to macroeconomic instability. Trade openness contributes positively and significantly to FDI in all three countries, reinforcing the importance of external market access and liberal trade policies. These empirical findings confirm the theoretical expectation that strong institutions, integration in global value chains, macroeconomic stability, and openness are essential determinants of sectoral FDI inflows in emerging economies.

Table 4: Panel Short-Term Estimators (ECM Results)

Variable	China (Coef.)	India (Coef.)	Brazil (Coef.)	Significance
ΔINST	0.21	0.18	0.09	**
ΔGVC	0.33	0.26	0.12	**
ΔGDP	0.19	0.15	0.07	**
ΔINF	–0.07	–0.05	–0.03	*
ΔTRD	0.11	0.09	0.04	**
ECT (t–1)	–0.61	–0.49	–0.31	***

Note: Δ denotes first differences; *** p<0.01, ** p<0.05, * p<0.1.

Table 4 presents the short-run coefficients obtained from the ARDL estimation for each country, including the Error Correction Term (ECT), which captures the speed at which deviations from long-run equilibrium are corrected. The short-run dynamics confirm that changes in institutional quality (ΔINST), GVC participation (ΔGVC), and GDP growth (ΔGDP) significantly and positively influence short-term fluctuations in FDI inflows across all three countries. China again shows the highest responsiveness, particularly in GVC-related adjustments (0.33), indicating that rapid changes in global integration have immediate effects on investor behavior. India also demonstrates a positive short-run response, albeit with slightly lower elasticities. Brazil shows more moderate coefficients overall, suggesting weaker responsiveness to short-term institutional and structural shifts.

The ECT coefficients are all negative and statistically significant at the 1% level, validating the existence of cointegration identified earlier. These values indicate the speed of adjustment toward long-run equilibrium following a shock. China's adjustment speed is the fastest (–0.61), meaning that over 60% of any disequilibrium is corrected within one period. India follows with an adjustment rate of –0.49, while Brazil adjusts more slowly at –0.31. These results imply that China and India not only maintain stronger long-run relationships among FDI determinants but also correct short-run imbalances more efficiently, likely due to more adaptive institutional mechanisms and policy responsiveness. Inflation

(ΔINF) continues to exhibit a weak but negative influence in the short run, underscoring its role as a risk factor for FDI volatility. Trade openness (ΔTRD) remains significant, reaffirming the short-term sensitivity of investment flows to changes in trade policy and global demand.

5. Conclusions and Policy Recommendations

The results of the ARDL estimations provide a compelling empirical basis for refining theoretical understandings of foreign direct investment in emerging economies. The evidence confirms that institutional quality and global value chain (GVC) integration are not peripheral but core structural determinants of sectoral FDI, particularly in China and India. These findings support institutionalist theories that emphasize the importance of governance frameworks, regulatory effectiveness, and rule of law in reducing transaction costs and uncertainty for foreign investors. The divergence observed in Brazil suggests that weak institutional performance may neutralize the benefits of other macroeconomic fundamentals. Thus, a country's ability to credibly signal stability and reform capacity becomes a strategic asset in global capital competition.

For policymakers, the strong and consistent long-run influence of institutional quality on FDI inflows highlights the strategic importance of deep governance reforms. In China, the development of reliable legal systems, protection of investor rights, and efficient bureaucracy have created a favorable institutional climate for long-term investment, despite authoritarian political structures. India's democratic system, though often complex and fragmented, has made significant institutional strides, enhancing investor confidence. In contrast, Brazil's weak rule of law and regulatory unpredictability dilute the appeal of its otherwise resource-rich economy. The policy implication is clear: institutional development is not merely a normative objective but a functional necessity for attracting and retaining productive foreign capital.

Another major policy implication stems from the significance of GVC integration. Countries more embedded in international production networks enjoy spillover benefits in the form of technology transfer, higher value-added activities, and diversified investment flows. China's leadership in GVCs, through both backward and forward linkages, explains the strength of its manufacturing FDI. India's integration in service-oriented GVCs, particularly ICT and pharmaceuticals, mirrors similar dynamics. Brazil's relative isolation from high-tech and value-dense chains explains its lower GVC elasticity. Consequently, policies that promote trade facilitation, logistics infrastructure, and digital integration are essential for countries seeking to upgrade their GVC positioning and thereby attract more strategic FDI.

While institutional and structural variables dominate the long-run narrative, macroeconomic variables—especially inflation and GDP growth retain a significant role. The negative short-run impact of inflation suggests that macroeconomic instability acts as an immediate deterrent to FDI, undermining investor

trust and eroding expected returns. Conversely, positive GDP growth exerts a pull effect, signaling expanding market size and demand conditions favorable for investment. Thus, macroeconomic management must be tightly coordinated with FDI strategies. In contexts like Brazil, where inflation volatility remains a challenge, stabilization policies must be prioritized as a prerequisite for any medium-term investment strategy.

The heterogeneity of results across China, India, and Brazil implies that there is no single FDI policy recipe that fits all emerging economies. For China, sustaining institutional efficiency and deepening high-end GVC integration are key to moving up the investment quality ladder. India's priorities lie in consolidating reforms in land, labor, and digital governance to reduce investor friction. Brazil requires foundational governance restructuring, investment in infrastructure, and regional trade agreements to rebuild confidence. Each country must design a context-sensitive reform agenda that reflects its institutional maturity, comparative advantage, and geopolitical positioning within the global economy.

Finally, the study suggests that attracting high-quality FDI is not solely a domestic concern it requires strategic international cooperation. Engagements in multilateral trade agreements, bilateral investment treaties, and participation in regional blocs (e.g., RCEP for China, MERCOSUR for Brazil) can amplify a country's credibility and access to investor networks. Additionally, alignment with global standards in transparency, ESG compliance, and dispute resolution mechanisms can enhance a country's institutional signaling power. For emerging economies, the long-term objective must go beyond attracting capital flows toward embedding FDI within a national development strategy that promotes structural transformation, innovation, and inclusive growth.

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