




## FOREIGN DIRECT INVESTMENT AND EMPLOYMENT AS PRIMARY LONG-RUN DRIVERS OF ECONOMIC GROWTH

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### Abstract

Although the macroeconomic determinants of growth are studied at length, there is still a lack of study on many aspects of the BRICS, which now includes the new members Egypt, Ethiopia, Iran, Saudi Arabia, the UAE, and Indonesia, especially about the simultaneous consideration of unemployment along with FDI, trade openness, and inflation in a single panel model. The objective of this paper is to investigate the short- and long-run influence on GDP growth by accounting for heterogeneity within this community. Quantitative panel data analysis employing Panel ARDL with PMG estimator on secondary annual data (1991–2023) of 11 BRICS countries obtained from World Bank World Development Indicators. While FDI is positive and significant in the long run, unemployment is negative and significant (-0.217,  $p=0.008$ ). Trade openness and Inflation are positive but not statistically significant. In the short run, unemployment is negative (-1.528,  $p=0.002$ ); the error-correction term is -0.681 ( $p < 0.001$ ), implying that 68% of the adjustment occurs annually. FDI and unemployment are identified as major long-run determinants, with rapid equilibrium adjustment. The innovation lies in the extended BRICS panel and the more recent disclosure of more potent effects of unemployment on structural turns. To this end, policies should be oriented toward promoting FDI and reducing unemployment to ensure sustained and inclusive growth, and institutional improvements would further enhance the gains from trade.

**Keywords:** Economic Growth, Foreign Direct Investment, Inflation, Trade Openness, Unemployment.



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## INTRODUCTION

The trade, FDI, inflation, and unemployment nexus, and their combined effect on growth, have been a focal point in the recent empirical literature on emerging market and developing countries. Trade (including export and import) has been regarded as an important engine of economic growth as it improves the efficiency of resource allocation, transfers technologies, and expands the scale of the market (Minh & Trinh, 2023). Several studies in the literature evidenced that trade openness is conducive to long-

run growth, especially if supported by a sound macro environment and infrastructure investments (Radmehr et al., 2022; Chen & Jiang, 2023). However, certain authors warn that the gains are not equally shared and depend on the quality of institutions (Chen & Jiang, 2023; Alnsour et al., 2024).

Foreign direct investment (FDI) is a key channel for transferring capital, managerial skills, and technology internationally, which increases productivity and allows host countries to undergo structural changes (Minh & Trinh, 2023). There is a positive relationship between emerging market Foreign Direct Investment (FDI) inflows and Gross Domestic Product (GDP); the magnitude of its effect on GDP is dependent on the level of human capital and policy environment (Musibau et al., 2019). Where institutional arrangements are fragile, foreign direct investment FDI may not result in substantial spillovers or may even increase income disparity (Ouedraogo & Marlet, 2018).

Inflation, as a macroeconomic stability indicator, has ambiguous effects on economic growth (Le et al., 2021). Although modest inflation may stimulate demand and alleviate the real debt burden, extreme and volatile inflation is associated with reduced investment, resource misallocation, and slower GDP growth (Azam & Khan, 2022). Evidence from developing countries points to a threshold effect: beyond that point, inflation is highly damaging to growth (Ahuja & Pandit, 2020). Moreover, inflation volatility is observed to dampen investors' confidence, thereby impeding capital formation and trade development (Castro et al., 2004).

Unemployment, a wasting of labour resources, undermines production and household income and thus imposes a brake on aggregate demand and the capacity for growth in the long run (Yasmeen et al., 2023). Prolonged unemployment in poor nations can create vicious cycles, including reduced consumption, lower investment, and impaired human capital accumulation (Emery et al., 2012). The positive connection between economic growth and unemployment is not always evident. Since output gaps do not reflect movements in unemployment precisely (Watson, 2016), periods of strong economic growth do not necessarily reduce unemployment due to structural labour market rigidities.

Therefore, investigating the relationships between trade openness, foreign direct investment, inflation, and unemployment, and the GDP growth rate remains pertinent for the aspect of the BRICS economies (Rahman & Islam, 2023). A precise comprehension of these mechanisms is essential in designing holistic policies capable of inducing economic growth that is sustainable, inclusive, and resilient. Trade openness, FDI, inflation, and unemployment have a significant impact on economic growth in developing countries (Minh & Trinh, 2023; Spahija et al., 2025). Trade is related to more efficiency and the diffusion of technology (Chen & Jiang, 2023); FDI is linked with the transfer of capital and knowledge (Musibau et al., 2019); inflation provides signals of stability under threshold risks (Azam & Khan, 2022); and unemployment restricts both demand and supply (Yasmeen et al., 2023).

Some existing BRICS analyses focus on the original five members or omit recent members (Rani & Kumar, 2019; Joo et al., 2022). Overlooking heterogeneity such as the resource-driven UAE and the agrarian Ethiopia, as well as post-2020 shocks (Wicaksana & Widodo, 2024). While post-pandemic increases in unemployment have yet to be examined, this remains one of the least researched variables in the integrated model. Concern arises from BRICS 45% share of the global population and the geopolitical transition impacting growth (Kelmendi et al., 2025). The ARDL panel disaggregates the behavior of policy instruments, such as FDI incentives and labor market reforms. This study predicts both short- and long-run results, evaluates equilibrium adjustment, and provides policy suggestions to promote sustainable growth.

The study states that the opening of countries to the world market usually contributed positively to domestic economic growth (Awad, 2019). This happens because trade encourages countries to focus on what they do best, share knowledge, and benefit from producing goods more efficiently (Bamidele, 2025). For example, countries in the BRICS group that trade more compared to the size of their economy tend to grow faster (Burange et al., 2019). This growth comes from better productivity and selling a wider variety of products abroad (Santra, 2017).

In some Asian countries, trade works even better when there is good infrastructure, such as roads and ports, and friendly policies for foreign investment (Gallagher & Qi, 2021). But not all countries are as well served by trade. The outcomes depend on the strength of their local institutions and on whether their economy is stable (Mansfield & Reinhardt, 2008). In parts of Africa, merely opening up to trade without significant internal reform has at times brought trouble, including the loss of manufacturing jobs and an overdependence on a handful of export commodities (Ju et al., 2022).

Foreign Direct Investment (FDI) is also pivotal, as it brings capital, technology, and managerial know-how to the host economy (Chaudhuri & Ravallion, 2007). Many times, FDI promotes productivity

gains and structural transformation (Balsalobre-Lorente et al., 2022). Research on BRICS states indicates that FDI inflows positively contribute to GDP growth, especially in countries with well-developed human capital and nonrestrictive trade policies (Joo et al., 2022). However, the extent to which these advantages are realized largely depends on the quality of institutions and educational levels in the host country (Adegboye et al., 2020). In the context of weak governance, the effect of FDI can be constrained, and in certain instances, it can exacerbate inequality (Kaulihowa & Adjasi, 2018). FDI-led growth in Africa, for instance, is said to be more enduring if it is accompanied by robust domestic investment (Zekarias, 2016). Some recent works evaluate the full-fledged impact of FDI on economic growth forecasts by advanced qualitative models, revealing the importance of integration and structural change in emerging markets (Caushi, 2025).

The impact of inflation on growth in the context of macroeconomic stability is multi-channel and depends on its level and volatility (Chikwira & Jahed, 2024). A moderate positive inflation rate can be used to stimulate economic growth by lowering the real interest rate, which would promote borrowing and spending (Lieb & Schuffels, 2022). This consumer mentality and the subsequent increase in investor contributions have contributed to real GDP growth (Büttner et al., 2023). Yet, above certain critical levels in the 7–11% range observed for developing countries, it has been observed that inflation impedes growth due to uncertainty and the erosion of purchasing power (Younsi & Nafla, 2019). Relative prices are distorted by high inflation, making it more difficult to allocate resources efficiently, and it diminishes incentives for long-term investment, which is key to sustainable growth (Hidhiir et al., 2024).

In addition, inflation volatility exacerbates these adverse effects by further reducing the predictability of the economic environment (Hardy et al., 2019). This uncertainty can discourage firms from undertaking investment and long-term projects, as unpredictable inflation makes estimates of future costs and revenues less reliable (Mallick & Sousa, 2013). Results from the BRICS show that the importance of the level of inflation but price stability also matters; in the period of low aggregate inflation rates with low volatility of inflation was associated with stable GDP growth, while in the episodes of high inflation, volatility was co-moving with negative investment cycles (Hidhiir et al., 2024). Therefore, the ability to ensure moderate and stable inflation is important for creating an environment that promotes sustained growth and sound investment decisions (Abdelkawy, 2024). Contemporary modeling methodologies have provided a deeper understanding of inflation dynamics, with a focus on logistic models for prediction and analysis (Kapciu et al., 2024).

Unemployed people not only reduce potential output by wasting productive inputs, but also depress aggregate demand, a significant cause of economic growth (Fornaro & Wolf, 2023). When household incomes are so uncertain due to high unemployment, people cut back on spending, which means lower revenues for businesses and less reason for them to invest (Phung Thanh, 2022). This feedback loop can freeze GDP in place and deepen the recession. In developing countries, the problem is exacerbated by structural unemployment, which results from long-term mismatches between workers' skills and job requirements, as well as rigid labor market legislation (Di Tella & MacCulloch, 2005). These structural factors mean that the labour market does not clear effectively even in booms, so the positive employment effect of growth is diminished (Meager, 2009).

Sustainable job creation in such situations also requires specific policy interventions on the demand and supply sides of the labour market, as well as in the social protection (Mo et al., 2024). On the supply side, education, vocational training, and skill acquisition-focused investments may help meet the changing needs of the market (Storonyanska et al., 2025). On the demand side, changes targeting labor market rigidity and regulations, and fostering entrepreneurship, could also lead to job creation (Fan & Chan-Kang, 2005). Labour market-related regulations are inherently rigid and difficult to modify, and they could affect not only the size of formal employment but also the size of informal employment and the rate of shadow employment. Cross-country evidence also suggests that only through such multipronged approaches can GDP growth lead to a substantial reduction in poverty and an improvement in social welfare (Si et al., 2021). Additionally, labor market flexibility is crucial, as more flexible labor markets tend to experience a greater positive impact from a decrease in unemployment, reinforcing the need for institutional environments that facilitate labor mobility and the adjustability of the labor force (Asensio & Ferreira, 2024).

Unemployment reduces capital output and aggregate demand, and thus acts a constraint on GDP growth (Zhao et al., 2022). Findings from the developing world demonstrate that reducing unemployment rates positively affects growth, with the impact being more pronounced in countries with flexible labor markets (Li, 2023). Although full employment is essential in the fight against poverty, structural

unemployment in many developing countries still persists even in times of economic boom. This is mostly due to skill mismatches and labour market rigidities (Estevão & Tsounta, 2011). Cross-country analysis suggests that only when the growth of GDP is accompanied by the sustained creation of jobs will it result in a reduction of poverty and (Minh & Trinh, 2023)al welfare (Minh & Trinh, 2023).

The relationship between trade, foreign direct investment (FDI), inflation, and unemployment is complex and calls for subtle policies. Openness to trade creates markets not only for goods, but also for technology and productivity improvements, which may also strengthen the effects of FDI on economic growth (Wiredu et al., 2020). But this association is conditioned by macroeconomic variables; for example, high inflation disrupts price stability and competitiveness, which deters foreign direct investors and trade partners (Okwu et al., 2020). As a result, countries with unstable inflation rates may not benefit much from their attempts to open up trade or attract FDI, emphasizing the importance of sound monetary policies in addition to openness (Ismail & Burak, 2007).

Furthermore, the labor market is essential in both amplifying and dampening these effects (Muharremi et al., 2025). The impact of sustained employment growth on domestic consumption, which in turn drives demand for both imported and domestically produced goods, helps cement the positive trade and investment effects (Ge et al., 2022). Trade and FDI gains can be widely shared. Thus, their social and inequality-damaging effects can be mitigated through inclusive labour market policies oriented towards skill formation, job creation, and social protection (Knoerich, 2017). Hence, the conclusion for the policy makers of the developing countries is to put in place comprehensive policies that embrace macroeconomic stability as well as trade liberalization and labor market inclusiveness, so as to attain the best policy implications for growth and development (Seti et al., 2025).

**RESEARCH METHOD**

This study examines the full 11-member expanded BRICS (Brazil, Russia, India, China, South Africa, Iran, Saudi Arabia, Egypt, Ethiopia, United Arab Emirates, Indonesia) from 1991 to 2023. We used census sampling by selecting the entire population of current BRICS members. These nations typify a wide range of economies, from developing to resource-endowed, and differ greatly in terms of industrialization, trade openness, and labour market configuration. The analysis is based on homogenized macroeconomic data from the World Bank’s World Development Indicators (WDI) dataset. The annual panel data were extracted directly from the World Bank WDI online database. The paper analyzes the impact of real economic growth on several macroeconomic indicators, including trade openness, inflation, FDI, and unemployment. This research is predicated on a quantitative study using secondary panel data to assess causal relationships among macroeconomic variables.

Table 1. Data Collection Instrument Grid

Variable	Definition	Unit	Source
GDP Growth	Annual percentage change in real Gross Domestic Product (constant 2015 US\$)	Percentage (%)	World Bank World Development Indicators (WDI)
Trade Openness	Sum of exports and imports of goods and services as a percentage of GDP	Percentage (%)	World Bank World Development Indicators (WDI)
Foreign Direct Investment (FDI)	Net inflows of foreign direct investment as a percentage of GDP	Percentage (%)	World Bank World Development Indicators (WDI)
Inflation	Annual percentage change in the Consumer Price Index (CPI)	Percentage (%)	World Bank World Development Indicators (WDI)
Unemployment	Percentage of the labor force that is actively seeking employment (modeled ILO estimate)	Percentage (%)	World Bank World Development Indicators (WDI)

Unemployment is the share of the active population that is unemployed (ILO modelled estimate). Trade openness is the ratio of exports and imports of goods and services to gross domestic product (GDP). Inflation is the annual percentage change in the cost of living given by the Consumer Price Index, CPI.

FDI is expressed as the net inflow of foreign direct investment as a percentage of GDP. Real GDP per capita is the total value of goods and services produced within an economy in a given period of time. This value is the annual percent change of a constant-price series with 2015 as the base year; US\$ is the currency unit. To this end, the present study utilizes a Panel ARDL approach, which enables us to explore the short-run dynamics and long-run relationships among the variables. The general specification of the Panel ARDL model can be expressed as follows:

$$GDPGrowth_{it} = \alpha_i + \sum_{p=1}^P \phi_{ip}GDPGrowth_{i,t-p} + \sum_{q=1}^Q \beta_{1iq}TradeOpenness_{i,t-q} + \sum_{r=1}^R \beta_{2ir}FDI_{i,t-r} + \sum_{s=1}^S \beta_{3is}Inflation_{i,t-s} + \sum_{u=1}^U \beta_{4iu}Unemployment_{i,t-u} + \varepsilon_{it} \dots (1)$$

In this framework, (i) refers to the country and (t) to the time period. To capture unobserved heterogeneity across countries, the model incorporates country-specific fixed effects ( $\alpha_i$ ). The Panel ARDL approach provides several advantages. First, it accommodates variables with different integration orders, whether in levels or first differences, without requiring them to be integrated at the same order. Second, it allows the joint estimation of short-run and long-run coefficients and therefore provides more detail on both the immediate and permanent effects of trade openness and other macroeconomic variables on unemployment. This, further, captures cross-country heterogeneity in the speed of adjustment towards the long-run equilibrium, which is crucial when considering a club of countries as diverse as the BRICS.

For estimation, this paper uses the Pooled Mean Group (PMG) estimator and treats it as the baseline. The PMG estimator imposes the same long-run coefficients across countries but allows the short-run dynamics and error variances to be heterogeneous. This guarantees that the long-run relations are consistent across all BRICS nations and, at the same time, allows individual countries' short-run patterns to be reflected. Stationarity tested using Im-Pesaran-Shin (IPS). Cointegration was examined via the Pedroni test. Estimator selection validated by the Hausman test. The PMG estimator was chosen as the preferred method. The dataset is a panel of N=11 countries over T=33 years (1991-2023), yielding 315 observations after removing missing values. The post hoc power calculation with G-Power suggests that this sample size has power 0.80 to detect a medium-sized effect (Cohen's  $f=0.25$ ) at  $\alpha=0.05$  in panel regression models, in agreement with suggestions for sufficient power for reliable estimation in dynamic panel ARDL models (Cohen, 2016). This supports the study's statistical adequacy in identifying significant long-run and short-run relationships.

## RESULTS AND DISCUSSION

Table 2. Stationary Test

Variables	Statistic (W-t-bar)	Level	Statistic (W-t-bar)	1 <sup>st</sup> Difference
Unemployment	-0.2861	Nonstationary	-7.6977*	Stationary
Trade Openness	-1.4299	Nonstationary	-12.5215	Stationary
Foreign Direct Investment	-3.7700*	Stationary		
Inflation	-6.6170*	Stationary		
GDP Growth	-12.5215*	Stationary		

\*Statistic (W-t-bar) p-value < 0.05

The findings of the IPS stationarity test indicate that the data are suitable for analysis using the Panel ARDL model in this research. Notably, in their level form, unemployment and trade openness are non-stationary; they become stationary after first differencing, implying that they are integrated of order one. In contrast, foreign direct investment, inflation and GDP growth are I(0) at their levels, hence these are treated as level variables. In sum, all variables in the model are I(0) or I(1), and no variable is I(2). This result meets the necessary condition of the Panel ARDL method, which requires the absence of I(2) variables. Consequently, given these stationarity results, the Panel ARDL should provide consistent estimates of the short-run and long-run relationships among trade openness, foreign direct investment, inflation, economic growth, and unemployment for the BRICS nations.

Table 3. Pedroni Test

Test Stat	Panel Value	Group Value	Result
v-stat	0.208	—	Weak cointegration
rho-stat	-2.496	-1.058	Cointegration
t-stat	-7.042	-8.164	Cointegration
ADF-stat	-5.049	-4.464	Cointegration

Pedroni’s cointegration test reveals evidence of a long-term relationship among the studied variables. The data were adjusted to eliminate unit-specific heterogeneity. The results suggest that the null hypothesis of no cointegration is strongly rejected for the panel t-statistic (-7.042), the panel ADF-statistic (-5.049), the group t-statistic (-8.164), and the group ADF-statistic (-4.464). Even though the panel v-statistic (0.208) is quite weak, the t and ADF statistics are more relevant in testing for cointegration. Therefore, it can be concluded that a long-run equilibrium relationship exists, indicating that the model can be taken to the next stage of analysis using estimators that account for cointegration.

Table 4. Hausman Test

Model Selection Test	Chi <sup>2</sup> (Prob Chi <sup>2</sup> )
Hausman Test	2.20 (0.6997)

The Hausman-type test for assessing coefficient equality examines whether the differences between DFE and PMG coefficients are systematic. The test yields a chi-square statistic with one degree of freedom of 2.20 and a p-value of 0.6997. Since the p-value is too large to reject the null hypothesis based on common levels of significance (0.05, for instance), we conclude that there is no difference. This means that the PMG estimator is appropriate since there is no systematic difference between the DFE and PMG coefficients. Consequently, the PMG results are deemed efficient and consistent within the panel specification, while accommodating heterogeneous short-run dynamics across units.

The Panel ARDL (PMG) estimation results for the BRICS nations offer significant insights into the dynamics of GDP growth, trade openness, FDI, inflation, and unemployment, broadly aligning with existing literature. Stationarity tests indicate that all variables are either I(0) or I(1), meeting the requirements for the Panel ARDL method, in line with standard dynamic panel analysis practices. Pedroni’s cointegration test confirms a long-term relationship among these variables, suggesting an equilibrium that reflects the interdependence of economic growth, trade, investment, inflation, and labour market conditions (Zekarias, 2016; Minh & Trinh, 2023).

Table 5. Pooled Mean Group Regression

Dependent Variable: GDP Growth	Short Run	Long Run
Independent Variables	Coefficient (P-value)	Coefficient (P-value)
Error Correction Term	-0.6811783*** (0.000)	
Trade Openness	0.0673704 (0.245)	0.0143218 (0.402)
Foreign Direct Investment	0.3449687 (0.225)	0.2569041** (0.014)
Inflation	-0.0514429 (0.468)	0.0014849* (0.058)
Unemployment	-1.528328*** (0.002)	-0.217211*** (0.008)
Constant	2.940792*** (0.000)	
N	315	

\*p-value<0.1, \*\*p-value<0.05, \*\*\*p-value<0.01

The Pooled Mean Group (PMG) estimation was applied to a dataset encompassing 315 observations. The estimates of the long-run coefficients showed that Foreign Direct Investment (FDI) has a positive and statistically significant effect on GDP growth (coef. = 0.2569041,  $p = 0.014$ ). That is, in the long run, a 1% increase in Foreign Direct Investment (FDI) will lead to a 0.2569041% increase in GDP Growth at the 5% significance level. On the other hand, unemployment has a significant negative impact (coef. = -0.217211,  $p = 0.008$ ). This implies that, in the long term, for a 1% rise in unemployment, we expect GDP growth to fall by 0.217211% at the 1% significance level. Although inflation (coef. = 0.0014849,  $p = 0.058$ ) has a positive effect on GDP growth, it is significant only at the 10% level. Only trade openness (coef. = 0.0143218,  $p = 0.402$ ) has a significant positive effect on GDP Growth.

In the long run, FDI is shown to have a positive and significant impact on GDP growth, supporting previous studies that highlight how foreign capital inflows, technology transfer, and managerial expertise boost productivity in host countries (Musibau et al., 2019; Balsalobre-Lorente et al., 2022; Joo et al., 2022; Minh & Trinh, 2023). The results indicate a strong inverse relationship between unemployment and economic growth. This finding is consistent with earlier studies, which argue that low labor utilization constrains production capacity, weakens aggregate demand, and ultimately hampers economic development (Emery et al., 2012; Yasmeen et al., 2023). By contrast, trade openness and inflation show positive coefficients, but their long-run effects are not statistically significant. This outcome reinforces the view that the gains from trade are heavily conditioned by institutional quality and macroeconomic stability (Chen & Jiang, 2023; Alnsour et al., 2024).

In the short run, the error correction term (ECT) is negative and statistically significant (coef. = -0.6811783,  $p < 0.001$ ), indicating that approximately 68.11783% of the short-run disequilibria are corrected every year. This accounts for the rapid rate of convergence and the cointegration observed among the panels. Among the short-term dynamics, unemployment has a significant negative relationship with GDP growth (coef. = -1.528328,  $p = 0.002$ ). This means that in the short term, if Unemployment increases by 1%, GDP Growth will decrease by -1.528328% with a significance level of 1%. While trade, inflation, and FDI do not show statistical significance. The intercept is positive and statistically significant (coef. = 2.940792,  $p < 0.000$ ), implying a steady-state short-run growth rate.

In the short run, deviations from long-run equilibrium are corrected relatively quickly, suggesting that BRICS economies are able to adjust rapidly in response to shocks (Joo et al., 2022; Minh & Trinh, 2023; Kalai et al., 2025). This rapid convergence is particularly relevant in the context of recent global shocks, including the COVID-19 aftermath and geopolitical uncertainties, where quick policy responses like fiscal support, monetary easing, or labor market interventions appear to have facilitated faster stabilization in many BRICS members compared to slower adjustments in other emerging blocs, reinforcing the group's adaptability amid expansion and increased heterogeneity, as well as the importance of holistic policies embracing macroeconomic stability, trade liberalization, and labor market inclusiveness for sustainable growth (Rahman & Islam, 2023; Seti et al., 2025; Wiredu et al., 2020).

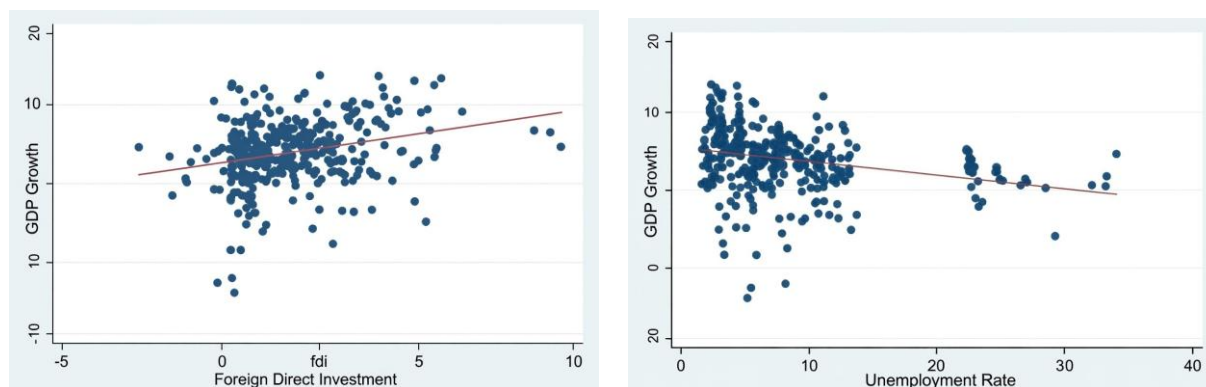


Figure 1. Graphical analysis of the relationship between Foreign Direct Investment and Unemployment with GDP Growth in 11 BRICS nations from 1991 to 2023

The first scatter plot shows the relationship between FDI and GDP growth. The dots are fairly widely scattered across most of the data in the low FDI range, 0-5%, and a GDP growth of 0-10%. The regression line of the data indicates a slightly positive trend, indicating a weakly positive correlation; higher FDI slightly leads to higher GDP growth. The second scatter plot displays the relationship between the unemployment rate prediction and GDP growth. Here, the regression line has a negative

slope, indicating a negative association between the variables: higher unemployment rates are associated with lower GDP growth. That is, higher unemployment usually accompanies slower or negative economic growth. While most points in the figure for unemployment are in the 0-15% range. This visual evidence strengthens the argument that the diverse BRICS bloc represents a large share of the global population. These visuals further bolster the claim that the heterogeneous BRICS grouping accounts for a majority of the world population. Policymakers need to focus on attracting high-quality FDI and relaxing labor market rigidities to achieve the greatest sustainable and inclusive growth impact. (Wiredu et al., 2020; Chen & Jiang, 2023; Rahman & Islam, 2023; Seti et al., 2025).

Overall, these results imply that FDI and unemployment are growth anchors in the long run, and the corrections of equilibrium errors in this panel are relatively rapid. These suggest that foreign direct investment (FDI) inflows and labor market performance play a key role in maintaining economic growth in the BRICS members. The aforementioned issues are also indicative of trade and inflation effects that are sensitive to context, and reinforce the importance of good institutions, macroeconomic stability, and inclusive labor market policies to realizing full growth potential (Minh & Trinh, 2023; Rahman & Islam, 2023; Wiredu et al., 2020).

The study's implications are that FDI-friendly BRICS policymakers should provide tax incentives and FDI-related solutions to reduce recruiters' risk, such as skills and labour flexibility, to manage unemployment in an orderly manner. This means offering tax breaks and simpler rules to attract high-quality FDI, while also investing in worker training, flexible labor rules, and support systems to reduce unemployment and ensure that growth benefits reach more people across the group's diverse economies.

The novelty of the study lies in its comprehensive ARDL for the 11 BRICS members, using 2023 data, which highlights the outsized role of employment and foreign direct investment in economic growth. The post-pandemic influences on the effects of unemployment and FDI are omitted from the earlier integrated models. The study has some limitations as it uses aggregate data, and a two-way causality may exist, for instance, higher growth might be attracting more FDI or reducing unemployment, and it does not consider other variables such as institutional quality or human capital, which might influence the results. Future studies may also be extended by disaggregating by sectors such as manufacturing, services, and resources. Include institutional or governance factors, use data beyond 2023 to take into account the latest developments, or compare subgroups to take into account the increasingly heterogeneous group.

## CONCLUSION

This study finds that unemployment has a significant negative effect on economic growth in both the short run and the long run, and that FDI has a significant positive long-run effect on the expanded BRICS economies. There is no strong evidence of the long-run effects of trade openness and inflation. These results suggest that policies should focus on attracting productive FDI and on undertaking labor market reforms to reduce unemployment and promote sustainable and inclusive growth. Stationarity and cointegration tests indicate that the Panel ARDL model is also an appropriate method for capturing dynamic adjustment and long-run equilibrium among the variables. The Pooled Mean Group (PMG) estimates reveal that FDI has a positive and significant impact on GDP growth in the long run, while unemployment has a negative and significant impact. Instead, trade openness and inflation show positive correlations with growth, but their long-term effects are not significant, indicating that the benefits largely depend on the strength of institutions and national stability.

The error-correction term being negative and significant in the short-run suggests that the speed of adjustment towards the long-run equilibrium is fairly high, which means BRICS economies are capable of endogenous recovery after a shock. However, in the short run, trade openness, inflation, and FDI are not statistically significant, but unemployment is the most relevant short-run constraint. Together, these results highlight the importance of policies that increase FDI and decrease unemployment to achieve sustainable economic growth. Furthermore, institutional development, macroeconomic stability, and inclusive labor market policies are necessary if the potential gains from trade openness and inflation control are to be fully realized. In short, this research confirms the strong nexus between investment and labor market outcomes and macroeconomic management as determinants of long-term growth for developing countries.

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## AUTHOR CONTRIBUTIONS

The first author is primarily responsible for the conceptualization, methodological design, initial manuscript drafting, data collection, data processing, data analysis, result software evaluation, result visualization, and validation. The second and third authors participated in drafting the research proposal, managing the project, providing resources, acquiring funding for the research, reviewing the manuscript, and supervising the research.

## CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

## USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

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