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Trade Openness and FDI as Determinants of Growth: Insights from the Global South's Developing Economies

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ABSTRACT

This research investigates how Trade Openness and Foreign Direct Investment (FDI) influence economic growth in developing regions of the world, with a particular focus on the Global South. Using a comprehensive panel dataset covering the period from 1990 to 2020, the study includes 134 developing and emerging countries representing different income groups and geographical regions. The main variables considered in the analysis are Economic Growth, Trade Openness, FDI inflows, Population, and Exchange Rate, all of which were obtained from the World Bank's World Development Indicators database. In the analytical framework, descriptive statistics and correlation analysis were initially performed to provide an overview of the dataset and to check for potential multicollinearity among variables. Following these preliminary examinations, advanced econometric techniques were applied, specifically the Cross-Sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) model, which effectively accounts for cross-sectional dependence and slope heterogeneity across countries. This model was employed to evaluate both the short-run and long-run impacts of trade openness and FDI on economic growth. The results reveal that trade openness plays a significant role in stimulating economic growth in the short run, indicating that increased trade integration and global market participation can lead to immediate economic benefits. However, in the long run, the relationship between openness and growth was found to be statistically insignificant, suggesting that the long-term gains from openness might depend on complementary factors such as institutional quality, industrial capacity, and human capital development. Overall, the study underscores the nuanced and context-dependent nature of globalization's impact on growth in the Global South. *or driving short-term growth, its long-term effects are weaker.*

1. INTRODUCTION

Economic growth has always been a crucial aim for countries in the Global South. This region stretching across Africa, Latin America, and Asia includes economies that differ greatly in terms of income levels, institutions, and policy choices. Yet, despite this diversity, many of them share similar struggles: weak institutions, limited access to finance, and an ongoing challenge of finding a stable and meaningful place in the global economy (Todaro & Smith, 2020). Within this context, two policy levers are repeatedly highlighted: Openness and FDI. Both are often

viewed as pathways through which developing economies can raise productivity, gain access to new technologies, and secure stronger links to international markets.

In practice, trade openness usually refers to reducing or eliminating the restrictions that limit cross-border exchange. When tariffs, quotas, and other barriers are lowered, countries are better able to reach wider markets, improve the movement of goods and services, and stimulate competition. FDI, by contrast, is about the flow of capital across borders. For developing countries, it is not only a source of financing but also a means

of transferring knowledge, skills, and technologies. In many cases, FDI helps local firms move up the value chain and connect more directly to global production networks (Borensztein et al., 1998). Still, the benefits of trade and FDI are not automatic. While they are generally expected to foster growth, evidence from the developing world shows mixed results (Rodrik, 1997). Part of the reason for these mixed outcomes lies in the diversity of the Global South itself. Business-friendly countries and the ones which have better institutions are typically better placed to attract and use FDI in ways that support long-term development. On the other hand, countries with fragile governance or weak regulatory capacity often struggle to fully benefit from liberalised trade or foreign capital inflows. In some cases, poorly managed FDI can even intensify vulnerabilities rather than reduce those (Acemoglu et al., 2005).

For decades, trade openness has been seen as a central ingredient of development strategies (Frankel & Romer, 1999). FDI has attracted similar attention, particularly for its potential to provide capital, technology, and managerial expertise that might otherwise remain out of reach (Caves, 2007). Although scholars broadly agree on these potential benefits, there is less agreement on the precise conditions under which they translate into sustained growth.

This paper looks at how TO and foreign direct investment (FDI) have influenced economic growth in the Global South between 1990 and 2020. The study uses a panel data approach, which makes it possible to see not only the separate contributions of openness and foreign capital but also how the two interact. Other factors that are known to matter for growth, such as population changes and exchange rate movements, are also taken into account to give a fuller picture (Mankiw et al., 1992). The choice of period is not accidental. The early 1990s were a turning point for many developing economies, as governments began opening up their markets and actively seeking foreign investment as part of

broader reform agendas (Moran, 1998). At the same time, countries like China and India were reorienting their development strategies towards openness and capital inflows. Their paths cannot simply be copied elsewhere, but they do offer important lessons for others (Dollar, 2001). The three decades under review also include the 2008 global financial crisis, a moment that disrupted trade flows, tightened capital markets, and tested the resilience of economies across the Global South (World Economic Outlook, 2010). Altogether, this thirty-year window provides a useful setting to explore how trade and investment have shaped growth trajectories under both favourable and adverse global conditions.

This paper aims to assess the relationship between TO, FDI, and growth in developing countries, specifically those in the Global South. By looking across a range of countries, the study seeks to capture not just whether these factors matter, but how their impact depends on domestic institutions and governance structures. In doing so, it highlights that the benefits of openness and investment are not simply about size or scale, but about the capacity of domestic systems to channel them into long-term development.

2. LITERATURE REVIEW

2.1 Theoretical Foundations

The question of how trade openness and foreign investment shape economic growth has preoccupied economists for decades, but there has never been a single answer. Different schools of thought have seen the relationship in very different ways. Modernisation theorists were among the first to set out a clear story. They argued that countries pass through a series of stages on the road to development, and that opening up to global markets plays a vital role along the way. Rostow's (1959) famous model, with its five stages of growth, captures this idea neatly. In his account, the "take-off" phase is especially important, when countries need access to foreign capital and industry to sustain their

transformation. Others, particularly those writing within dependency theory, painted a rather less optimistic picture. They pointed out that the world economy is not an even playing field and that the rules tend to favour the already industrialised nations. From this angle, greater participation in trade and investment often does little to close the gap. Instead, developing countries can find themselves stuck as suppliers of raw materials or low-value goods, with limited space to build more complex industries of their own. Rather than providing a springboard for growth, trade and FDI can end up reinforcing old patterns of dependency and widening inequality.

A line of analysis, provided by the Heckscher–Ohlin (H–O) model, shifts attention to differences in resource endowments. It predicts that countries will specialise in goods that rely on the factors they possess in abundance while importing those that use resources they lack. For many developing economies, this suggests that trade liberalisation could boost growth by allowing them to exploit comparative advantages. Yet, as experience shows, these gains are not automatic. Whether openness translates into sustained development depends on the surrounding conditions—institutions, policy choices, and the infrastructure that helps channel trade and investment into productive outcomes. More recent theories, captured in Endogenous Theory of growth, stress the value of human capital, innovation, and technology for long-term growth. Romer (1990) argues that trade openness and FDI help with knowledge transfer and technology spread, especially when backed by solid education and research policies. In this framework, developing countries can gain significantly from engaging with global markets and investment, as long as they have the necessary capacity to absorb new knowledge.

2.2 Empirical Studies

Empirical studies present mixed findings on the impact of TO. Some concluded that in developing countries trade liberalization helps increase income and reduce poverty. However, the advantages of trade openness do not apply

universally. Rodrik (1997) points out that the impact of trade liberalisation are very subjective, with countries experiencing different outcomes based on their institutional quality, economic structure, and policy consistency.

Trade openness has also been linked to income inequality, though this relationship is debated. The Kuznets Curve indicates that inequality may initially rise during economic growth but will eventually fall. In practice, studies like Dobson and Ramlogan (2009) have shown that trade liberalization can increase income gaps, especially when trade benefits are not distributed evenly.

Recent research has expanded this area of study. Osuma and Nzimande (2024) analyzed data from Sub-Saharan Africa between 1990 and 2020. Their study showed that while trade openness positively affects long-term growth, its benefits can be diminished by high levels of external debt. Research on landlocked developing nations has shown that greater openness contributes to growth in both the short and the long term. However, it stressed that these gains are significantly boosted by regional integration and infrastructure development.

According to Borensztein et al. (1998), the growth-enhancing effect of foreign direct investment (FDI) is strongest in countries that possess sufficient human capital to adopt and apply the technologies brought in from abroad. In their study, Alfaro et al. (2004) emphasize that without robust financial systems, the potential benefits of FDI may not fully materialize, underscoring the importance of institutional depth in the growth process. Still, the positive effects of FDI are not guaranteed. In some cases, FDI may push out local firms, lead to profit repatriation, or worsen socio-economic gaps. Figini and Gorg (2011) examined how FDI can increase income inequality, especially when investment is focused on capital-intensive industries that hire only a small part of the workforce.

Recent studies have tried to address these complexities. For instance, a 2023 study in Humanities and Social Sciences Communications

analysed data from 90 middle-income countries. Results showed that when foreign direct investment grows by 1 percent, economic growth tends to expand by about 9.3 percent, mainly due to productivity improvements. A different study covering 102 developing countries from 2000 to 2018 uncovered that strong institutions enhance the effect of FDI on growth positively, reinforcing the view that institutional capacity is a key factor in economic results.

The connection between trade openness and FDI is also worth close consideration. Each can influence growth on its own, yet their effects are often mutually reinforcing. Economies that engage more openly in trade often attract higher levels of foreign investment, as investors value wider market access and a stable business environment. At the same time, FDI can stimulate trade by drawing host countries into global value chains and encouraging production geared toward export markets. The extent to which these dynamics deliver sustained benefits, however, depends heavily on the broader policy environment and the strength of domestic institutions. Taken together, the theoretical arguments and empirical evidence suggest that context matters greatly when evaluating the role of openness and investment. While many studies document positive associations with growth, the unevenness of outcomes across countries underscores the importance of policies that are sensitive to local conditions whether institutional quality, absorptive capacity, or broader socio-economic structures.

2.3 Research Gap

One noticeable shortcoming in the existing literature on TO, FDI, and growth lies in the way cross-country linkages are treated in empirical analysis. Much of the panel data research, particularly on developing countries, tends to assume independence across national economies. In reality, however, global trade flows and financial connections create a high degree of interdependence, and overlooking this cross-sectional dependence (CSD) risks producing biased estimates and misleading inferences.

Another limitation is the common

assumption that the effects of TO and FDI are uniform in all countries in the Global South. Such an approach fails to acknowledge the wide variations in institutional quality, economic structures, and levels of development that shape how openness and investment translate into growth. What may prove beneficial in one setting could yield weaker or even adverse outcomes in another. Moreover, the bulk of the literature focuses on individual countries or narrow regional groupings, leaving relatively few studies that examine the Global South as a collective whole. A broader perspective could reveal cross-cutting patterns and provide a more comprehensive view of how trade and FDI interact with growth in diverse contexts.

Recognising and addressing these gaps would not only strengthen future empirical work but also deepen our understanding of the complex economic dynamics facing developing countries today.

2.4 Objective

The primary aim of this paper is to assess the simultaneous influence of trade openness and FDI on economic growth across the Global South. By examining a wide range of developing countries, this study aims to provide a clearer understanding of how these factors influence economic growth and interact with broader development processes.

3. DATA AND METHODOLOGY

This study examines the period from 1990 to 2020 and focuses on countries in the Global South, using the classification developed by the Finance Centre for South-South Cooperation at the United Nations. The sample covers 134 countries, which together represent a wide spectrum of income levels from low- to high-income and span multiple regions. To build a consistent dataset, countries with more than five years of missing data were dropped, while those with smaller gaps were retained, with missing values estimated through interpolation.

The analysis is centred on the connection between TO, FDI and growth, while also

considering inequality as a broader development concern. To capture these dynamics, standard proxies are employed: annual GDP growth is used to measure economic performance; TO is represented by the share of trade (exports + imports) in GDP (Sibindi, 2019) and FDI is measured through inflows. Since in such studies control variables play a huge role, this study has employed Population and exchange rate to account for demographic and structural influences. The dataset was sourced from the World Bank database, which allowed for consistent comparisons across different countries.

The empirical work proceeds in stages. It begins with summary statistics to provide an overview of the dataset reporting the descriptive statistics. Looking at this stage helps us understand how patterns differ across countries and over time. After that, it becomes necessary to examine whether the explanatory variables overlap too much, which could create multicollinearity issues. Correlation matrices are first used to assess the direction and strength of linear relationships, followed by the calculation of Variance Inflation Factors (VIF). These checks are important because they confirm that the independent variables are not excessively correlated, giving greater confidence in the robustness of the regression results.

While in many existing studies, the cross-sectional dependence (CD) is often overlooked but as implied by –Yildirim et al. (2020) the existence of CD raises the risk that unit root tests (UR) will produce biased or false results. The data set for this study has $N > T$. As highlighted by (Baltagi, 2008), in case of $N > T$ the CD is checked by either CDLM test or CD Test (Pesaran, 2004). If CD is absent, UR tests (first generation) such as IPS, LLC, and Fisher can be applied, since they rely on the assumption of independence across units. However, when cross-sectional dependence is present, these methods tend to produce unreliable results. To address this issue, second-generation tests, such as the CIPS test (Pesaran's Crosssectionally augmented IPS), CADF (Pesaran's

Crosssectionally augmented Dicky Fuller), Bai & Ng PANIC test, Fisher type with bootstrap, etc. have been proposed (Barbieri, 2009).

For further analysis, test by Pesaran & Yamagata (2008) called Slope Homogeneity Test is to be carried out, as different Panel Data Models have different assumptions. In case homogeneity is ignored, the regression results might lead to prejudice thus giving wrong hypothesis results (Appiah et al., 2021).

Since panel data comprises of time series element along with the cross sectional element, it becomes necessary to check whether the data is stationary or not. Further, co-integration tests to analyse the long run need to be checked as given by (Westerlund, 2008).

The choice of the apt econometric model is based on the outcomes of the UR tests and the presence or absence of CD. When the variables have zero UR at levels $I(0)$ or at first difference $I(1)$, and no evidence of cross-sectional dependence is found, a standard Panel ARDL framework—such as PMG, MG, or DFE—can be applied. On the other hand, if the variables are both of $I(0)$ and $I(1)$ and cross-sectional dependence exists, the CS-ARDL model becomes more suitable. This approach extends the traditional Panel ARDL by explicitly accounting for interdependencies across cross-sections (Chudik & Pesaran, 2015).

The Cross-Sectionally Augmented ARDL (CS-ARDL) framework, proposed by Chudik and Pesaran (2015), is expressed in the following equation. This specification incorporates cross-sectional averages of explanatory and dependent variables, allowing the model to address CD across units.

$$y_{it} = \alpha_i + \lambda_{it} + \phi_i y_{(i,t-1)} + \theta_i x_{it} + \sum_{j=0}^p \delta_{ij} x_{(t-j)} + \sum_{j=1}^q \gamma_{ij} y_{(t-j)} + u_{it} \dots (1)$$

where, y_{it} : Predicted variable for unit i at time t , x_{it} : explanatory variables' vector, y_{t-j} , x_{t-j} : Cross-sectional averages of y and x , α_i : Unit-specific intercept, λ_{it} : Coefficient on time trend, ϕ_i : Lagged dependent variable coefficient, θ_i : Short-run coefficients of regressors, δ_{ij} , γ_{ij} : Coefficients on cross-sectional averages, u_{it} : Error term.

Based on these tools and techniques, the

data is analysed and further results are presented in next section.

4. RESULTS & DISCUSSIONS

The first step in the analysis was to calculate summary statistics. Table 1 presents the basic data overview for the key variables used in the analysis. On average, GDP growth (GDPGR) stands at 4.55%, with a standard deviation (SD) of 4.35. The values range from a low of -13.13% to a high of 17.38%, illustrating the wide disparities in economic performance among the countries included in the sample. Trade openness shows a mean of 71.14 and varies significantly, with values ranging from 15.37 to 220.62. This wide dispersion suggests substantial differences in trade exposure among the countries over time. Foreign direct investment (FDI) also varies widely, with an average of 4.54 and values spanning from -2.25 to 51.22, highlighting both negative inflows and periods of substantial investment.

Countries in the sample have a population of 17.26 million on average, but there is wide

episodes of currency depreciation or appreciation.

To rule out the possibility of Multicollinearity in the data, the next step was to calculate correlation matrix. According to Table 2, no variables exhibit strong correlation thus ruling out the possibility Multicollinearity (MU) in the data. Overall, the correlation matrix does not reveal any concerning strong relationships, which supports the suitability of including all variables in the regression analysis without significant multicollinearity concerns.

The matrix shows low to moderate pairwise correlations. Stronger correlation is observed between FDI and TradeOpenness, while multicollinearity risk appears low.

While correlation matrix supported including all variables in the analysis. However, to cross check, VIF values were also checked for ruling out the possibility of MU, as shown in Table 3. The results show that MU is not an issue in the model. The VIF values remain well under the standard cutoff of 10, with trade openness

Table1: Summary Statistics

Variable	Mean	SD	Min	Max
GDPGR	4.55	14.350	-13.128	17.380
TradeOpen	71.137	37.417	15.371	220.617
FDI	4.538	6.348	-2.247	51.216
Pop	17.256	24.139	0.293	103.511
ER	70.893	84.276	1.677	350.979

Table 2: Correlation Matrix

	GDPGR	Trade Open	FDI	Pop	ER
GDPGR	1.000				
TradeOpen	0.042	1.000			
FDI	0.106	0.450	1.000		
Pop	0.092	-0.372	-0.137	1.000	
ER	0.046	-0.014	0.004	0.236	1.000

variation. The smallest has only 0.29 million people, while the largest reaches 103.51 million, as reflected in the relatively high SD of 24.14.

Finally, the exchange rate (ER) exhibits the greatest variability, with a mean of 70.89 and a SD of 84.28, ranging from 1.68 to 350.98. This likely captures both differences in currency regimes and

Table 3: VIF

Variable	VIF	1/VIF
TradeOpen	1.44	0.696
FDI	1.26	0.797
Pop	1.24	0.807
ER	1.07	0.938
Mean VIF	1.25	

recording the highest at 1.44 and the overall mean standing at 1.25.

Table 4: CD Test

Variable	CD Statistic	p-value
GDPGR	46.209	0.000
TradeOpen	69.590	0.000
FDI	48.666	0.000
Pop	122.486	0.000
ER	246.280	0.000

Table 4 reports the results of the CD test for all variables in the panel dataset. The CD statistics are notably high for all variables, with values ranging from 46.21 for GDP growth (GDPGR) to 246.28 for population (Pop), and all associated p-values are 0.000. The results show that MU is not an issue in the model. The VIF values remain well under the standard cut off of 10, with trade openness recording the highest at

Table 5: CIPS Test Results

Variable	CIPS Statistic10%	Critical Value5%	Critical Value1%	Critical Value
GDPGR	-3.984	-2.03	-2.10	-2.20
TradeOpen	-2.133	-2.03	-2.10	-2.20
fdi	-3.614	-2.03	-2.10	-2.20
Pop	-1.909	-2.03	-2.10	-2.20
ER	-2.017	-2.03	2.10	-2.20
dPop	-2.522	-2.02	-2.08	-2.19
dER	-3.966	-2.02	-2.08	-2.19

Table 6: Slope Heterogeneity Test

Statistic	Value	p Value
Delta	14.281	0.000
Adj Delta	15.967	0.000

1.44 and the overall mean standing at 1.25. This result underscores how closely linked the countries in the dataset are and supports the use of advanced panel econometric methods that take these interdependencies into account.

Table 7: Westerlund Cointegration Test

Test	Statistic	p Value
Westerlund Variance Ratio	-2.3399	0.0096

Since Table 4 confirms the presence of strong CD in the dataset, the study proceeds with a second-generation panel UR test, specifically the CIPS approach. The outcomes of this test are reported in Table 5. The results show that most of the variables are stationary at levels. In particular, the CIPS statistics for GDP growth (GDPGR), TO, FDI, and ER fall below the critical values at the 1%, 5%, and 10% significance levels, confirming their

Table 8: Pedroni Cointegration Test

Test	Statistic	p Value
Modified Phillips–Perron t	-3.4288	0.0003
Phillips–Perron t	-20.5994	0.0000
Augmented Dickey–Fuller t	-20.3727	0.0000

Table 9: CS-ARDL Short-Run Estimates

Variable	Coefficient	Std. Error	z	P> z
LD.GDPGR	-0.4538	0.0256	-17.70	0.000
TradeOpen	19.7671	6.7535	2.93	0.003
fdi	-0.1196	0.1073	-1.11	0.265
dPop	-75.1901	353.5742	-0.21	0.832
dER	-0.1458	0.5866	-0.25	0.804
L.TradeOpen	-20.1456	8.6612	-2.33	0.020
L.fdi	0.0388	0.0996	0.39	0.697
L.dPop	-235.3076	568.0573	-0.41	0.679
L2.dPop	152.1007	313.3451	0.49	0.627
L.dER	0.5767	0.3822	1.51	0.131

Table 10: CS-ARDL Adjustment Term

Variable	Coefficient	Std. Error	z	P> z
lr_GDPGR	-1.4538	0.0256	-56.69	0.000

Table 11: CS-ARDL Long-Run Estimates

Variable	Coefficient	Std. Error	z	P> z
lr_TradeOpen	-0.853	72.8936	-0.30	0.768
lr_dER	0.275	90.3490	0.79	0.429
lr_dPop	-88.5569	69.6306	-1.27	0.203
lr_fdi	-0.033	80.0986	-0.34	0.732

stationarity. Specifically, GDPGR, TradeOpen, and FDI show CIPS statistics of -3.984, -2.133, and -3.614, respectively, all of which are below the 5% critical value of -2.10, suggesting stationarity at the level.

However, population (Pop) with a CIPS statistic of -1.909 does not pass the 5% or 1% critical values, indicating that it is non-stationary at the level. First differencing (dPop) results in a CIPS statistic of -2.522, which is below the 5% critical value of -2.08, suggesting that population becomes stationary after first differencing. Similarly, the exchange rate (ER) is non-stationary at the level, with a CIPS statistic of -2.017, but first differencing (dER) results in a CIPS statistic of -3.966, indicating stationarity at the first difference.

Table 6 presents the results of the slope heterogeneity (SH) test proposed by Pesaran and Yamagata (2008). This test evaluates whether the slope coefficients are consistent across the countries in the panel. The Delta statistic is 14.281 and the adjusted Delta is 15.967, with both tests yielding p-values of 0.000. Since these values are well below the 5% significance level, the null hypothesis of homogeneous slopes is rejected. This indicates that the effect of the explanatory variables on the dependent variable is not uniform across countries, but instead varies considerably across the sample.

The results indicate that all variables are stationary at either I(0) or I(1). Since the dataset also shows evidence of CD and SH, the CS-ARDL approach (Chudik & Pesaran, 2015) is selected for the subsequent analysis. To assess whether a long-term equilibrium relationship exists among

the variables, the study employs both the Westerlund and Pedroni co-integration tests, with results summarized in Tables 7 and 8.

As shown in Table 7, the Westerlund Variance Ratio test produces a statistic of -2.3399 and a p-value of 0.0096. This is significant at the 1% level, allowing the rejection of the null hypothesis of no co-integration and providing strong evidence of a long-run relationship among the panel variables. Table 8 reports the findings from the Pedroni co-integration test. All three test statistics Modified Phillips-Perron t, Phillips-Perron t, and Augmented Dickey-Fuller t are highly significant, with p-values well below 1%. These results consistently reject the null hypothesis of no co-integration, further confirming the presence of a long-term equilibrium among the variables across the panel. Together, the findings from both tests support the conclusion that the variables under study are co-integrated, validating the use of long-run panel estimation techniques in the subsequent analysis.

Tables 9, 10 and 11 present the results of the CS-ARDL model, which examines both the short-run dynamics and long-run associations between GDP growth and its key determinants: TO, FDI, population, and exchange rate.

Table 9 indicates that lagged growth variable (LD.GDPGR) has a statistically significant negative effect on current GDP growth, with a coefficient of -0.4538 ($p < 0.01$). This suggests the presence of mean reversion or adjustment dynamics in the data. Trade openness is positively associated with GDP growth in the short run (coefficient = 19.7671, $p < 0.01$), suggesting that increased openness to trade can stimulate

economic performance in the immediate term.

In contrast, FDI, population (dPop), and changes in ER (dER) are not statistically significant in the short-run model. Their respective p-values are well above conventional thresholds, indicating limited immediate influence on GDP growth.

Table 10 displays the adjustment term (lr_GDPGR), which captures the speed of correction toward long-run equilibrium. The coefficient is -1.4538 and statistically significant at the 5% level ($p < 0.01$), implying a strong and stable error correction mechanism. This result supports the existence of a long-run relationship among the variables, consistent with the earlier co-integration test findings.

Table 11 summarizes the long-run coefficients. None of the explanatory variables are significant in the long-run model. Trade openness, FDI, population, and exchange rate changes all exhibit p-values above the 10% level, suggesting that their long-run influence on GDP growth is statistically weak or inconclusive in the current panel setting.

Overall, the CS-ARDL results suggest that while TO plays a significant role in driving short-run growth, its long-run effect as well as that of other variables is less certain. Nevertheless, the significant adjustment term confirms the model's validity and the existence of a long-run equilibrium to which the system reverts over time.

5. CONCLUSION

This study examined how economic growth is influenced by key macroeconomic factors, including trade openness, FDI, population growth, and exchange rates. It used panel data analysis across different countries. The empirical analysis relies on the CS-ARDL model, an approach well suited to macroeconomic panel datasets that often exhibit cross-sectional dependence and heterogeneous slope coefficients. Accounting for these features is essential to avoid biased estimates and to capture more accurately the dynamics at play (Pesaran, 2006; Chudik & Pesaran, 2015).

The results indicate that, in the short run, both previous GDP growth and current TO significantly influence present growth. This observation is consistent with classical and endogenous growth theories, which emphasize that openness can enhance efficiency, improve resource allocation, and broaden access to international markets (Frankel & Romer, 1999; Wacziarg & Welch, 2008). The positive and significant coefficient on trade openness indicates that economies with more open trade regimes are better positioned to capture growth opportunities, particularly by expanding exports and integrating more deeply into global value chains. This short-run effect underscores the immediate benefits of openness in fostering market access and efficiency gains.

The long-run estimates, however, tell a more complex story. None of the explanatory variables—trade openness, FDI, population growth, or exchange rate—emerge as statistically significant determinants of growth in the extended horizon. Although this may initially appear counterintuitive, it reflects the intricate nature of long-term development, where structural features such as institutional quality, governance capacity, technological change, and human capital formation often play decisive roles (Acemoglu et al., 2005; Barro, 1996). The impact of factors such as FDI and population on growth may only become apparent under certain conditions, for instance, when macroeconomic management is stable and the economy has adequate capacity to absorb these influences.

A key finding is the negative and statistically significant error correction coefficient, which reflects the adjustment process toward long-run equilibrium. This suggests that despite the absence of significant long-run coefficients for individual variables, the system as a whole tends to converge toward a long-run equilibrium. The Westerlund and Pedroni cointegration tests reinforce this interpretation, strongly rejecting the null of no cointegration (Westerlund, 2008). In practical terms, this means that while trade, FDI, and other macroeconomic factors may not show persistent independent

effects, their combined dynamics pull the system back to a stable growth path over time—an outcome consistent with growth models that emphasize adjustment processes and equilibrium correction. The findings from the CD and SH tests provide further justification for employing the CS-ARDL model. The observed cross-sectional dependence indicates that countries may be simultaneously affected by global or regional economic shocks. Slope heterogeneity reflects the different effects of macroeconomic variables across various economies. These findings warn against using pooled models that assume uniform relationships and emphasize the need for more tailored, country-specific policy measures.

From a policy standpoint, the study highlights the need to maintain and improve trade openness as a short-run growth driver. Policymakers should work to enhance trade-related infrastructure, lower non-tariff barriers, and promote regional trade agreements. Simultaneously, improving the quality and effectiveness of institutions and macroeconomic management is vital for transforming macroeconomic variables into long-lasting growth.

Future research could benefit from breaking down the analysis further. This could include looking at developed versus developing countries, exploring sector-specific impacts like manufacturing versus services, or adding structural variables such as education, technological adoption, and institutional indices. Additionally, examining the impact of external shocks, such as global financial crises or pandemics, may provide further insights into how different economies adapt and maintain resilience.

To sum up, the analysis shows that while the selected macroeconomic variables do not display strong long-run effects on economic growth, their short-run influence is significant. Moreover, the evidence of long-run equilibrium dynamics points to the importance of adopting flexible and adaptive policy measures that can respond to changing economic conditions. These results add to the broader debate on growth and economic management, showing that development does not follow a single path but is shaped by the unique circumstances and conditions of each country. ■

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