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THE INFLUENCE OF MACROECONOMIC DYNAMICS ON ECONOMIC GROWTH IN DEVELOPING G20 COUNTRIES

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Abstract

This study investigates the long-run and short-run effects of macroeconomic variables—inflation, interest rates, exchange rates, foreign direct investment (FDI), and government expenditure—on economic growth using annual panel data from nine developing G20 economies over the period 2000–2023. The Panel ARDL model with the Pooled Mean Group (PMG) estimator is applied to capture cross-country heterogeneity while ensuring consistent long-run estimates. Long-run results indicate that inflation (β=0.147; p<0.01), FDI (β=0.191; p<0.01), and government expenditure (β=0.390; p<0.01) positively and significantly affect GDP growth, whereas interest rates exert a negative impact (β=-0.249; p<0.01). Exchange rates show no significant long-run effect. In the short run, FDI (β=0.046; p<0.05) and exchange rate (β=0.876; p<0.01) significantly stimulate growth, while inflation shows marginal significance (β=0.044; p<0.10). The error correction term (β=-0.846; p<0.01) confirms rapid adjustment toward equilibrium. These findings highlight the importance of inflation stability, prudent monetary policy, FDI promotion, and efficient fiscal spending in sustaining economic growth across developing G20 countries.

Keywords: Economic Growth, Panel ARDL, Inflation, FDI, Developing Countries.

INTRODUCTION

The global economy in the 21st century has undergone a profound structural transformation, marked by the shifting concentration of economic power toward emerging markets. Developing G20 member countries increasingly shape global output, trade flows, and investment patterns, while simultaneously facing multifaceted macroeconomic dynamics that influence their growth trajectories. These economies confront various challenges such as inflation volatility, interest-rate fluctuations, exchange-rate pressures, foreign capital mobility, and fiscal constraints, all of which play critical roles in determining economic stability and long-term expansion. For instance, Indonesia's economic performance over the past two decades has been shaped by the management of inflation, exchange-rate stability, and the inflow of foreign direct investment (FDI), consistent with empirical findings on emerging economies (Ohioze et al., 2022; Rosli et al., 2022). Similarly, the experiences of Brazil and India demonstrate how effective monetary policy—particularly interest-rate adjustments—can strengthen investment attractiveness and support sustainable growth (Bajaj, 2020; Joo & Shawl, 2023). These diverse macroeconomic settings reveal that inflation, interest rates, exchange rates, FDI, and government expenditure exhibit heterogeneous impacts on economic activity across emerging G20 countries (Abueid, 2020).

Long-term data trends further reinforce the varying economic conditions among emerging G20 nations. Between 2000 and 2023, China and India maintained consistently high growth rates, while Argentina, Turkey, and South Africa experienced heightened instability and recurrent contractions. Inflation also displayed vast disparities, with Argentina and Turkey undergoing extreme price surges compared to the stable low-to-moderate inflation observed in Indonesia, India, Mexico, and China. Meanwhile, interest-rate behavior differed substantially across countries, reflecting differences in central bank credibility, institutional quality, and resilience to external shocks. Exchange-rate movements, FDI inflows, and government expenditure levels likewise varied widely, influenced by factors such as governance effectiveness, fiscal capacity, and political stability (Ameziane & Benyacoub, 2022; Almalik et al., 2024). Government expenditure patterns also differed structurally, where countries with greater fiscal strength like Saudi Arabia maintained high spending levels, while economies such as Indonesia and India operated within more restricted fiscal spaces, underscoring the non-uniform nature of macroeconomic responses across emerging economies (Ahuja & Pandit, 2020). In addition to conventional macroeconomic indicators,

structural conditions play a substantial role in shaping long-term economic performance. Infrastructure quality, human capital development, climate adaptation, innovation capacity, and digital transformation increasingly influence how countries navigate macroeconomic shocks and sustain economic growth. Investments in infrastructure act as growth catalysts, human capital improvements enhance labor productivity, and climate adaptation strategies support long-term economic resilience. Moreover, the digital transformation of micro, small, and medium enterprises (MSMEs) contributes to inclusive growth by increasing productivity and widening market access.

Despite the extensive body of research examining macroeconomic determinants of growth, empirical findings remain inconsistent. Inflation does not uniformly suppress growth, exchange-rate depreciation does not always improve external competitiveness, and the impact of FDI varies widely depending on institutional quality and macroeconomic stability (Chen et al., 2023). These inconsistencies highlight an important research gap: macroeconomic variables have asymmetric and non-universal effects across emerging G20 economies. A methodological approach that accommodates both long-run equilibrium dynamics and short-run macroeconomic adjustments is therefore essential to accurately capture these complexities.

Given this background, the present study aims to empirically analyze the effects of inflation, interest rates, exchange rates, FDI, and government expenditure on economic growth in nine developing G20 member countries—South Africa, Saudi Arabia, Argentina, Brazil, India, Indonesia, Mexico, China, and Turkey—using annual panel data from 2000 to 2023 and employing the Panel Autoregressive Distributed Lag (Panel ARDL) framework. This study contributes to the literature by providing updated cross-country evidence on macroeconomic–growth dynamics, applying an econometric model that distinguishes short-run from long-run effects, and offering policy-relevant insights for strengthening macroeconomic management and promoting sustainable and inclusive economic growth in emerging G20 nations.

LITERATURE REVIEW

Keynesian Theory

Keynesian theory asserts that aggregate demand is the primary determinant of output and economic growth, particularly in the short run. In this view, the economy does not always achieve equilibrium automatically; therefore, government intervention through fiscal and monetary policy becomes crucial to stabilize and stimulate economic activity. Productive government spending—such as infrastructure and education—is believed to increase aggregate demand and foster growth, especially in developing countries (Ahuja & Pandit, 2020). An expansion in the size of government, within reasonable limits, has also been shown to contribute positively to economic growth through the aggregate-demand mechanism (Bajrami et al., 2022).

Furthermore, Keynesian theory highlights inflation as a consequence of demand expansion. While moderate inflation may be tolerable, excessive inflation can undermine growth, as evidenced by empirical findings in India and the Balkan region (Nadig & Viswanathan, 2019; Bajrami et al., 2025). Meanwhile, interest rates serve as a key instrument influencing private investment; high interest rates tend to suppress investment and slow economic growth (Davcev et al., 2018). The effectiveness of fiscal policy also depends on the composition of government expenditure, where investment-related spending tends to stimulate growth more strongly than consumption-based spending (Saleh & Harvie, 2005). Overall, Keynesian theory provides a foundational perspective for understanding short-run economic responses to changes in government spending, inflation, and interest rates, particularly in developing economies facing macroeconomic volatility.

Mundell-Fleming Model

The Mundell–Fleming model is an extension of the IS–LM framework for open economies, explaining how monetary and fiscal policies influence output through interest rates, exchange rates, and capital flows. Under a floating exchange rate regime, a reduction in interest rates typically induces capital outflows, resulting in currency depreciation and an increase in exports. Conversely, under a fixed exchange rate system, the effectiveness of monetary policy becomes limited because central banks must intervene to stabilize the exchange rate (Serrano & Summa, 2015). In developing countries integrated into global financial markets, the effectiveness of monetary transmission is often affected by external volatility. Lubis et al. (2025) show that the responsiveness of market interest rates to central bank policy weakens during periods of liquidity normalization, thereby slowing transmission to the real sector. This illustrates the need for adaptive fiscal–monetary policy coordination to maintain output stability.

The exchange rate also plays a central role in the transmission mechanism. Ameziane and Benyacoub (2022) found that exchange-rate volatility significantly affects growth in emerging markets, and its impact depends on the exchange-rate regime. Intermediate regimes are considered more capable of mitigating the adverse effects of exchange-rate fluctuations than fully flexible arrangements. These findings align with the view that exchange-rate expectations and domestic financial-market characteristics influence the strength of policy transmission (Blanchard et al., 2017). Despite its simplifying assumptions, the Mundell–Fleming model remains a key analytical framework for understanding the short-run impact of macroeconomic policy in open economies (Garcia & Gonzalez, 2014), and is highly relevant in supporting the application of the Panel ARDL approach in this study.

Endogenous Growth Theory

Endogenous Growth Theory emphasizes that technology, capital accumulation, and human-resource quality are internal determinants of long-run growth. Within this framework, Foreign Direct Investment (FDI) serves as a crucial channel for technology transfer, production-efficiency improvement, and human-capital enhancement through knowledge spillovers. The effectiveness of FDI, however, depends on domestic absorptive capacity—such as education, health, and institutional quality—resulting in unequal benefits across countries. A substantial body of empirical evidence supports the positive relationship between FDI and long-term growth. Ayenew (2022), using the PMG/ARDL model in Sub-Saharan Africa, found that FDI exerts a positive and significant long-run effect, consistent with the predictions of endogenous growth theory. In the context of G20 countries, Almalik et al. (2024) employed cointegration and VECM techniques and obtained similar results, reinforcing the argument that openness to foreign investment accelerates technological diffusion and productivity improvement. This is further supported by the classical view that human capital is a key lever for maximizing the benefits of FDI; Azam and Ahmed (2015) show that human capital and FDI complement each other in driving long-term economic growth.

Methodologically, the use of PMG/ARDL and VECM offers advantages in distinguishing between short-run and long-run effects, where the long-run coefficient of FDI reflects its structural contribution to potential growth. The presence of a significant error-correction term strengthens evidence of a long-run equilibrium relationship between FDI and GDP. Thus, Endogenous Growth Theory provides strong grounding that FDI is not merely a funding source but a central mechanism shaping growth through technology, capital deepening, and human-capital development. Taken together, these three theoretical perspectives provide a comprehensive lens through which the interactions among macroeconomic variables can be understood across different time horizons. Keynesian theory explains short-run demand-driven dynamics, the Mundell–Fleming model captures external-sector transmission mechanisms in open economies, while Endogenous Growth Theory highlights long-run productivity and technological channels. Integrating these insights enables the formulation of an analytical structure that connects government expenditure, inflation, interest rates, exchange-rate fluctuations, FDI, and economic growth within a unified explanatory pathway. Building on these theoretical foundations, the study develops a conceptual framework that maps the hypothesized causal relationships among variables, illustrating both short-run adjustments and long-run equilibrium linkages as predicted by the theories above. This conceptual structure is visually summarized in Figure 1, which presents the directional influences derived from the integrated theoretical reasoning and serves as the basis for the empirical model employed in this research.

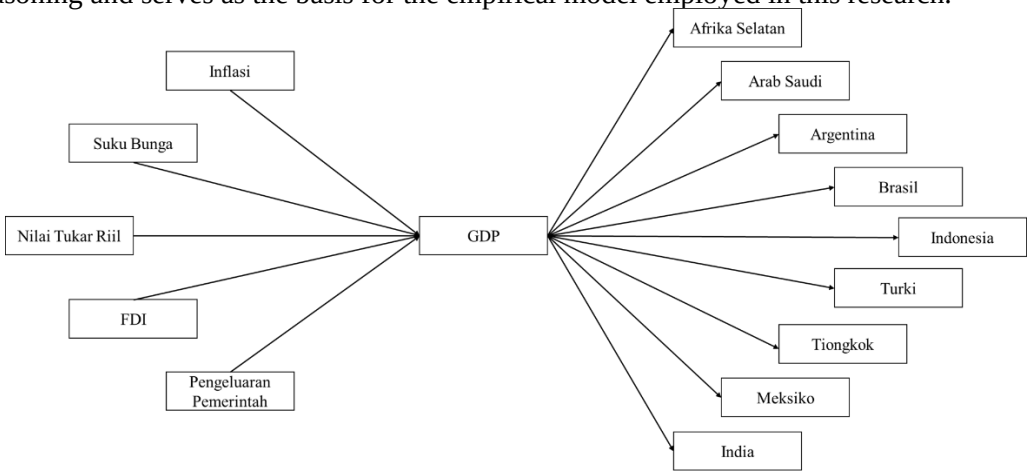

Figure 1. Conceptual Framework

As illustrated in Figure 1, the conceptual framework integrates the theoretical perspectives discussed earlier by outlining the directional relationships among inflation, interest rates, exchange rates, government expenditure, FDI, and economic growth. Each path depicted in the framework reflects theoretical reasoning derived from Keynesian Theory, the Mundell–Fleming Model, and Endogenous Growth Theory, as well as empirical evidence from emerging economies. Based on these theoretical linkages and the causal structure presented in the conceptual framework, the following hypotheses are formulated to guide the empirical analysis. Hypotheses represent provisional answers to the research questions, formulated based on theoretical propositions and the logical structure of the conceptual framework. Accordingly, the hypotheses of this study are as follows:

1. Inflation has a negative effect on economic growth (GDP) in both the short run and the long run in developing G20 countries.
2. Interest rates have a negative effect on economic growth (GDP) in both the short run and the long run in developing G20 countries.
3. The exchange rate has a negative effect on economic growth (GDP) in the short run and a positive effect in the long run in developing G20 countries.
4. Foreign Direct Investment (FDI) has a positive effect on economic growth (GDP) in both the short run and the long run in developing G20 countries.
5. Government expenditure has a positive effect on economic growth (GDP) in both the short run and the long run in developing G20 countries.

METHOD

Research Design and Scope

This study adopts an associative quantitative research design to examine the causal relationships among key macroeconomic variables in developing G20 member countries. The variables analyzed include inflation (INF), interest rates (IR), the real exchange rate (RER), Foreign Direct Investment (FDI), and government expenditure (GE) as potential determinants of economic growth (GDP). The Panel Autoregressive Distributed Lag (Panel ARDL) method is selected because it allows the simultaneous estimation of short-run dynamics and long-run equilibrium relationships while accommodating heterogeneous country-specific adjustments. Furthermore, the method is appropriate for variables that are integrated at different orders, I (0) or I (1), provided none is integrated at I (2), consistent with the framework introduced by Pesaran, Shin, and Smith (1999, 2001).

Sample and Time Frame

The study covers nine developing members of the G20: South Africa, Saudi Arabia, Argentina, Brazil, India, Indonesia, Mexico, China, and Turkey. These countries are selected due to their structural similarities as emerging economies and their increasing influence on global economic dynamics. The dataset consists of annual observations spanning the period 2000–2023, providing 24 years of balanced panel data suitable for dynamic econometric analysis.

Data Sources and Measurement of Variables

The analysis relies entirely on secondary data obtained from the World Bank's World Development Indicators and Global Economic Monitor. Economic growth (GDP) is measured as the annual percentage change in real gross domestic product, representing national productive capacity. Inflation (INF) is captured using the annual percentage change in the GDP deflator or Consumer Price Index as an indicator of price stability. Interest rates (IR) refer to domestic lending or policy rates that reflect the stance of monetary policy. The real exchange rate (RER) is measured using the real effective exchange rate index, adjusted for relative inflation differentials with major trading partners. Foreign Direct Investment (FDI) represents net inflows of foreign investment as a share of GDP, indicating the level of economic openness. Government expenditure (GE) refers to general government consumption as a percentage of GDP, representing fiscal intervention in the economy. All variables are expressed in ratio form and harmonized across countries to ensure comparability within the panel structure.

Data Analysis Technique

This study employs the Panel Autoregressive Distributed Lag (Panel ARDL) approach to estimate the short-run and long-run relationships among macroeconomic variables. This technique, originally formalized by Pesaran, Shin, and Smith (1999), is suitable for analyzing dynamic heterogeneous panels with variables integrated at mixed orders (I(0) or I(1)). The baseline long-run equation estimated in this study is formulated as follows:

$$GDP_{i,t} = \alpha_i + \beta_1 INF_{i,t} + \beta_2 IR_{i,t} + \beta_3 RER_{i,t} + \beta_4 FDI_{i,t} + \beta_5 GE_{i,t} + \varepsilon_{i,t}$$

This specification is further transformed into a dynamic ARDL representation through the inclusion of lagged dependent and independent variables. Two estimators are considered: the Mean Group (MG) estimator, which allows full heterogeneity across countries, and the Pooled Mean Group (PMG) estimator, which constrains long-run coefficients to be homogeneous while permitting short-run coefficients to differ. The appropriate estimator is determined through the Hausman test (Hausman, 1978), which evaluates the validity of the long-run homogeneity assumption. Prior to estimation, all variables undergo panel unit root testing based on the Dickey–Fuller and Augmented Dickey–Fuller (ADF) framework to ensure that none is integrated at order I(2), as including such variables would invalidate the ARDL structure (Dickey & Fuller, 1979). Optimal lag length is determined using the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC), ensuring that the model captures relevant short-run dynamics without sacrificing parsimony.

Long-run equilibrium is assessed using the Error Correction Term (ECT) derived from the ARDL error-correction representation. A negative and statistically significant ECT coefficient confirms the presence of cointegration and indicates the rate at which short-run disequilibria are corrected, consistent with the mechanism described by Engle and Granger (1987). Once cointegration is verified and the appropriate estimator selected, hypothesis testing is performed for both short-run and long-run coefficients. A variable is considered statistically significant when its p-value is below 0.05.

RESULTS AND DISCUSSION

Descriptive Statistics

The descriptive analysis reveals substantial heterogeneity in macroeconomic conditions across nine G20 developing countries. Argentina and Turkey exhibit the highest mean inflation rates (3.72% and 3.34%), indicating persistent price pressures, while China and Saudi Arabia maintain more stable conditions (1.46%). Interest rates vary significantly, with Brazil (2.29%) and Argentina (1.77%) showing tighter monetary conditions compared to Saudi Arabia (0.16%) and Mexico (0.48%). FDI emerges as the most volatile variable, with Brazil and China attracting the largest inflows (3.23% and 2.75% respectively), while Indonesia shows the highest volatility with periods of capital outflows. These patterns underscore the importance of macroeconomic stability in supporting sustainable growth (Blanchard, 2017).

Unit Root Test

The unit root test was conducted using the Choi Z-statistic method (Choi, 2001) to ensure stationarity before applying the Panel ARDL model. This test is essential as the ARDL bounds testing approach requires variables to be I(0) or I(1), with no variables integrated at order two (Pesaran & Shin, 1999).

Table 1. Unit Root Test Results

Variable	Level (Choi Z-Stat)	Prob.	1st Diff (Choi Z-Stat)	Prob.
GDP	-5.379	0.000***	-9.355	0.000***
Inflation	-4.583	0.000***	-9.400	0.000***
Interest Rate	-4.832	0.000***	-10.015	0.000***
Exchange Rate	-0.630	0.264	-7.126	0.000***
FDI	-5.115	0.000***	-8.956	0.000***
Gov. Expenditure	-1.616	0.053*	-7.999	0.000***

*Note: *** p<0.01, ** p<0.05, * p<0.10.*

The results confirm that GDP, inflation, interest rate, and FDI are stationary at level I(0), while exchange rate and government expenditure become stationary after first differencing I(1). This mixed integration order validates the application of Panel ARDL methodology.

Optimal Lag Selection

Based on BIC (0.094) and HQ (-0.055) criteria, the ARDL (1,0,0,0,0,0) specification is selected as optimal. This parsimonious specification indicates that only GDP requires a one-period lag, while all independent variables affect growth contemporaneously (Wooldridge, 2016).

Panel ARDL Estimation Results

Table 2. Panel ARDL Estimation Results

Variable	Long-Run Coef.	Prob.	Short-Run Coef.	Prob.
Inflation	0.147***	0.000	0.044*	0.067
Interest Rate	-0.249***	0.000	-0.040	0.270
Exchange Rate	-0.408	0.140	0.876**	0.007
FDI	0.191***	0.000	0.046**	0.036
Gov. Expenditure	0.390**	0.001	-0.392	0.258
ECT	—	—	-0.846***	0.000

*Note: *** p<0.01, ** p<0.05, * p<0.10. ECT = Error Correction Term.*

The long-run estimation reveals that inflation (β=0.147), FDI (β=0.191), and government expenditure (β=0.390) positively and significantly affect GDP growth, while interest rate shows a significant negative effect (β=-0.249). Exchange rate is insignificant in the long run. In the short run, exchange rate (β=0.876) and FDI (β=0.046) significantly stimulate growth. The ECT coefficient (-0.846) indicates rapid adjustment toward equilibrium, with 84.6% of disequilibrium corrected within one period, confirming strong cointegration (Engle & Granger, 1987).

Cross-Sectional Heterogeneity

Table 3. Country-Specific Short-Run Coefficients

Country	ECT	INF	IR	ER	FDI	GE
South Africa	-0.963***	0.131	0.070	-0.458	0.016	-2.941**
Saudi Arabia	-1.308***	-0.034	0.099*	1.872	-0.060	-0.302
Argentina	-1.086***	-0.028	0.033	0.202	-0.006	-0.326**
Brazil	-1.053***	-0.029	-0.020	0.611	0.014	-0.088
India	-1.091**	-0.011	0.015	1.093	0.013	-0.484
Indonesia	-0.484**	0.116**	-0.130**	2.067**	0.111**	0.873**
Mexico	-0.745**	0.031	-0.050	-0.351	0.082	-0.146
China	-0.385**	0.109**	-0.167**	1.965**	0.134**	0.131
Turkey	-0.504**	0.114**	-0.205**	0.883	0.114**	-0.240**

*Note: *** p<0.01, ** p<0.05, * p<0.10. INF=Inflation, IR=Interest Rate, ER=Exchange Rate, GE=Gov. Expenditure*

The cross-sectional analysis reveals significant country-specific variations, supporting the heterogeneous panel approach (Pesaran & Smith, 1995). All countries exhibit negative and significant ECT coefficients, confirming long-run equilibrium adjustment. Saudi Arabia (-1.308) and Argentina (-1.086) show the fastest adjustment, while China (-0.385) and Indonesia (-0.484) demonstrate slower but stable convergence.

The Effect of Inflation on GDP

The estimation results indicate that inflation has a positive and significant effect on GDP in the long run (β=0.147, p<0.01), while showing marginal significance in the short run (β=0.044, p<0.10). This finding suggests that moderate inflation can serve as a growth driver in G20 developing economies. From a theoretical perspective, Keynes (1936) posited that mild inflation stimulates aggregate demand and production capacity utilization. Empirically, Khan and Senhadji (2001) identified threshold effects demonstrating that inflation below certain levels positively correlate with growth in developing countries. The cross-sectional results show that Indonesia (0.116), China (0.109), and Turkey (0.114) exhibit significant positive inflation effects, reflecting their capacity to harness demand-driven growth while maintaining relative price stability.

The Effect of Interest Rate on GDP

Interest rate exhibits a significant negative effect on GDP in the long run (β=-0.249, p<0.01), while the short-run effect remains negative but insignificant (β=-0.040, p=0.270). This confirms that monetary tightening consistently suppresses economic growth over time. According to Mankiw (2019), higher interest rates increase the cost of capital, thereby reducing investment spending and aggregate demand. Mishkin (2016) further emphasized the transmission mechanism through which monetary policy affects real economic activity via interest rate

channels. The insignificant short-run effect reflects monetary policy transmission lags, where interest rate changes require time to influence investment and consumption decisions in developing economies.

The Effect of Exchange Rate on GDP

Exchange rate shows contrasting effects across time horizons—insignificant in the long run (β=-0.408, p=0.140) but positive and significant in the short run (β=0.876, p<0.01). The short-run significance aligns with the Mundell-Fleming model (Mundell, 1963), which predicts that currency depreciation enhances export competitiveness through expenditure-switching effects. Rodrik (2008) found that undervalued exchange rates systematically promote economic growth in developing countries by expanding tradable sectors. The cross-sectional analysis reveals that export-oriented economies like Indonesia (2.067) and China (1.965) benefit significantly from depreciation, while import-dependent countries such as South Africa (-0.458) experience negative effects due to increased import costs.

The Effect of FDI on GDP

FDI demonstrates consistent positive and significant effects in both the long run (β=0.191, p<0.01) and short run (β=0.046, p<0.05). This finding strongly supports endogenous growth theory as articulated by Romer (1990), which emphasizes the role of knowledge spillovers in driving sustained economic growth. Borensztein et al. (1998) provided seminal evidence that FDI contributes to growth through technology transfer, contingent on host country absorptive capacity. The cross-sectional analysis reveals that Indonesia (0.111), China (0.134), and Turkey (0.114) benefit most significantly from FDI, reflecting their success in creating conducive investment environments with strong linkages to domestic industries.

The Effect of Government Expenditure on GDP

Government expenditure shows a positive and significant long-run effect (β=0.390, p<0.01) but an insignificant short-run effect (β=-0.392, p=0.258). This pattern confirms that fiscal policy operates as an effective growth instrument when directed toward productive investments. Barro (1990) theoretically demonstrated that productive government spending on infrastructure and education enhances long-run growth by raising private sector productivity. Blanchard and Perotti (2002) found fiscal multipliers exceeding unity during economic downturns in their empirical estimates. The cross-sectional results show substantial heterogeneity—Indonesia exhibits strong positive effects (0.873), while South Africa (-2.941) displays negative effects, potentially reflecting fiscal inefficiencies and crowding-out effects. In summary, the findings demonstrate that macroeconomic variables exert significant but heterogeneous effects on economic growth across G20 developing countries. The results confirm theoretical predictions from Keynesian economics regarding inflation and fiscal policy, validate endogenous growth theory concerning FDI's role in technology transfer, and support the Mundell-Fleming framework's exchange rate mechanisms. These findings underscore the need for country-specific policy calibration rather than uniform prescriptions.

CONCLUSION

This study set out to examine how key macroeconomic variables—namely inflation, interest rates, exchange rates, foreign direct investment, and government expenditure—shape economic growth in developing G20 countries, as outlined in the Introduction. Using the Panel ARDL framework, the empirical results confirm that these macroeconomic fundamentals exert distinct short-run and long-run effects, reflecting the structural heterogeneity among developing economies. The findings show that well-managed inflation supports economic growth, interest rates exert a persistent contractionary impact in the long run, and exchange rates influence growth only in the short run through competitiveness adjustments. FDI emerges as the most consistent driver of economic expansion, while government expenditure contributes positively in the long run but requires improved efficiency and timely realization to generate short-run impacts. These results collectively validate the theoretical expectations established in the introductory section and provide robust evidence of the macroeconomic channels discussed throughout the analysis. Looking forward, the study highlights several development implications. Policymakers in developing G20 countries should prioritize maintaining price stability, enhancing the absorption capacity for FDI, and improving the quality and efficiency of fiscal spending. Strengthening coordination between monetary, fiscal, and exchange-rate policies will be essential in managing short-term volatility while sustaining long-term growth. Future research may extend this study by incorporating nonlinear dynamics, structural breaks, or sectoral analyses to provide a more comprehensive understanding of macroeconomic resilience in emerging economies.

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