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The Universality of Foreign Direct Investment, Foreign Aid, and Domestic Investment on Economic Growth: A Multi-Panel Analysis of Developing Countries, 1993-2022

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Abstract

This study examines the impact of foreign direct investment, foreign aid, and domestic investment on the economic growth of 66 developing countries across four regions–Transitioning Economies, African Developing Countries, Asian Developing Countries, and Latin American and Caribbean Developing Countries from 1993 to 2022. Using panel data analysis with fixed- and random-effects models, we account for serial correlation and heteroskedasticity by clustering standard errors. Economic growth, the dependent variable, was measured by the GDP growth rate. The results showed that domestic investment consistently drives economic growth, while education expenditure negatively affects growth across all regions except Africa. Foreign aid has an insignificant effect on growth in most regions. The findings highlight the importance of domestic capital formation while also questioning the short-term effectiveness of foreign aid in spurring economic growth in developing countries. Tailored policies are recommended for each region to achieve sustainable economic growth; hence, the universality of the FDI-led growth hypothesis and the aid-led growth thesis are too optimistic for developing countries.

Keywords: Foreign direct investment (FDI), Foreign aid, Domestic investment, Economic growth, Panel data analysis

Introduction

The sustainable economic growth of developing countries has been a focal point of economic debates for decades. Scholars have identified various macroeconomic factors as contributors to economic growth in Third World countries. Some of the factors include foreign direct investment inflows (FDI), foreign aid (AID), domestic investment (DI), government expenditure, inflation, and trade openness, to mention a few. Moreover, the growth attributed to FDI appears disproportionate, as its effect on developed economies' growth is approximately 4.5 times that on developing economies in 2021 (UNCTAD, 2024a). Furthermore, the annual growth rate of FDI inflows across regions of developing economies is disproportionately distributed. African countries experienced the largest decline in the annual growth rate of FDI inflows, at -43.5%, while developing economies in the Americas recorded a 51.2% increase and Asia and Oceania recorded a 0.1% decline in 2022 (UNCTAD, 2023). This indicates that the FDI growth rate appears to be declining in developing economies, particularly in African countries.

Moreover, current trends in Official Development Assistance (ODA) reveal a troubling shift that undermines the potential for sustainable economic growth in developing countries (UNCTAD 2004b). Despite record levels of foreign aid in 2022, a $4 billion decline in ODA, particularly affecting over 70 developing nations, highlights a critical issue: increasing reliance on concessional loans rather than grants exacerbates debt burdens and diverts essential resources away from education and healthcare (UNCTAD, 2024b). This shift not only diminishes the effectiveness of aid in fostering long-term development, but also threatens the economic stability of developing countries, where aid flows have plummeted. Consequently, the current aid landscape poses significant challenges to achieving the Sustainable Development Goals, particularly in creating resilient economies capable of sustaining growth and improving living standards for billions of people. However, studies have identified the relevance of FDI, aid, and domestic investment in the economic growth of developing countries (Simionescu, 2016; Gherghina et al., 2019; Younsi et al., 2021; Voka et al., 2023; Fazaalloh, 2024; Hakim & Budi, 2024) and AID (Minoiu & Reddy, 2010; Driffield & Jones, 2013; Yiew & Lau, 2018) on economic growth.

Despite the robust body of literature, the relationships between economic growth, foreign direct investment (FDI), and foreign aid remain contentious. Existing studies, particularly those utilising panel data analysis, offer divergent conclusions, and country-specific research often exacerbates these inconsistencies, with scholars presenting conflicting evidence for the same nation (Ogbonna et al., 2021; Asaleye et al., 2023; Edo et al., 2023). This divergence indicates that the debate over the impact of FDI and foreign aid on economic growth remains far from settled, necessitating further research. In contrast, there is broad consensus in the literature that domestic investment positively influences economic growth in developing countries (Nguyen &

Trinh, 2018; Younsi et al., 2021). To contribute to this ongoing debate, this study assesses the universality of the effects of FDI, foreign aid, and domestic investment on the economic growth of developing regions. The structure of this paper includes a literature review, methodology and data, analysis of results and findings, and a summary of key insights with policy suggestions.

Literature Review

Economic growth has attracted significant attention in economics and related social sciences, with various influential factors identified, including Foreign Direct Investment (FDI) (Wondimu, 2023), foreign aid (Younsi et al., 2021), domestic investment (Younsi et al., 2021), and trade openness (Asamoah et al., 2019). While research has explored these variables through different economic theories, such as Neoclassical Growth Theory, which emphasises capital accumulation, and Endogenous Growth Theory, which highlights innovation/technology, the debate over the effects of these theories across diverse contexts persists. Existing literature reveals inconclusive evidence on how these elements interact and shape growth trajectories, indicating that the complexities of their relationships remain unresolved (Younsi et al., 2021).

Foreign Direct Investment and Economic Growth

Foreign direct investment (FDI) is a critical topic in Economic growth, often analysed through two main theoretical frameworks. The "*FDI-led growth hypothesis*" argues that FDI stimulates economic growth by increasing capital stock, creating jobs, facilitating technology transfer, and encouraging domestic investment (De Mello, 1999; Herzer et al., 2008; Mahfoudi et al., 2024; Akinola & Ohonba, 2024). By contrast, the "*market size hypothesis*" suggests that rapid growth in host countries generates new investment opportunities, thereby attracting FDI inflows (Peng et al., 2016; Mahmoodi & Mahmoodi, 2016; Wondimu, 2023). These frameworks highlight the complex relationships between FDI and economic growth, suggesting a need for further empirical exploration to resolve this debate.

The causal relationship between FDI and economic growth remains contentious, with studies yielding mixed results even within the same geographic and economic contexts. In Africa, while most studies indicate a positive impact of FDI on economic growth, empirical findings are not uniform. For instance, Younsi et al. (2021) employed a system-GMM approach to analyse data from 47 African countries between 1990 and 2016, concluding that FDI has a significant positive linear influence on economic growth but a negative nonlinear effect on growth. This aligns with similar results from Wondimu (2023), Mahfoudi et al. 2024), and Akinola and Ohonba 2024), using fixed effects and pooled mean group models, showing that FDI effectively impacts the economic growth of ECOWAS and Central and Eastern European countries, with various datasets and methodologies. Conversely, studies by Sakyi et al. (2015) and Asamoah et al. (2019) found inverse relationships, while Belloumi (2014) reported a neutral effect, indicating that neither the FDI-led growth nor the market size hypotheses hold in Tunisia. Wondimu's (2023) findings confirmed the market size hypothesis of unidirectional causality from economic growth to FDI. These discrepancies stem from variation in the study periods, estimation techniques, and control variables employed. Further investigation is essential to clarify the complex dynamics between FDI and economic growth in Africa.

Despite consistent positive results from studies focusing on Asia, some uncertainty remains due to the mixed findings. National studies indicate that foreign direct investment (FDI) fosters economic growth. Sharmiladevi (2024) found a positive effect of FDI in India (1990–2021) using the ARDL model. Similarly, Hussain and Haque (2016) and Sarker and Khan (2020) confirmed FDI's positive influence on Bangladesh's growth using ARDL/VECM techniques. However, Sarker and Khan (2020) supported the market size hypothesis, which contradicts Fazaalloh (2024), who validated the FDI-led growth hypothesis using fixed-effects and GMM analyses across 33 Indonesian provinces. The ambiguity surrounding the impact of FDI on economic growth is particularly evident in cross-country studies, likely due to country heterogeneity and the estimation methods employed. Banday et al. (2021), analysing BRICS economies from 1990 to 2018 with ARDL and Granger causality tests, found bidirectional causality between FDI and growth. The FDI-led growth and market size hypotheses affirm the findings of Omri et al. (2014) on MENA countries. However, Banday et al. (2021) reported an ambiguous FDI-growth relationship: positive in the short run but negative in

the long run. Moreover, Abdouli and Hammami (2017), revealed a positive impact of FDI on economic growth among MENA countries.

The literature on FDI's impact on economic growth in Europe and developing countries remains inconclusive. Among European cross-country studies, Comes et al. (2018) reported positive FDI effects, Voka et al. (2023) found negative impacts, and Gherghina et al. (2019 reported ambiguous results. In developing countries, Driffield and Jones (2013) and Makiela and Ouattara (2018) identified a positive FDI-growth relationship, while other studies found inconclusive results (Benetrix et al., 2023; Zardoub & Sboui, 2023), highlighting inconsistencies in the literature. Several studies have confirmed the FDI-led growth hypothesis across various contexts and methodologies, including fixed-effects, random-effects, and GMM estimation techniques (Azman-Saini et al., 2010a; Omri et al., 2014; Makiela & Ouattara, 2018; Hakim & Budi, 2024). Azman-Saini et al. (2010a) noted that the growth effect of FDI depends on a country's financial market development, although Azman-Saini et al. (2010b) argued against the impact of FDI despite earlier positive results. This implies that the debate on the impact of FDI on growth remains unsettled, and the controversy surrounding the causality between FDI and economic growth still requires further research.

Foreign Aid and Economic Growth

Theoretically, foreign aid is a critical component of contemporary debates on development assistance (Todaro & Smith, 2020). Beyond export earnings, private FDI, and foreign portfolio investment, developing countries receive foreign exchange from two key sources: public bilateral and multilateral development assistance and private aid from NGOs (Todaro & Smith, 2020). Both forms are classified as foreign aid, defined as 'the international transfer of public funds in the form of loans or grants, either directly between governments (bilateral aid) or through multilateral agencies like the World Bank' (Todaro & Smith, 2020). Foreign aid refers to public, non-commercial international transfers provided on concessional terms and is generally referred to as official development assistance (ODA). Empirical studies have revealed divergent outcomes in the relationship between foreign aid and economic growth across various contexts. Younsi et al. (2021) demonstrated a positive linear effect of aid on growth but noted a negative nonlinear impact in African countries. Asaleye et al. (2023) corroborated the positive influence of aid in both the short and long run using NARDL and VECM techniques. Ehigiamusoe et al. (2024) identified a significant growth impact of foreign aid in Nigeria, moderated by levels of human and physical capital. While foreign aid may fulfil preconditions for takeoff, as posited by the Big Push theory, Barre (2023) found that aid effectiveness varies by source. Specifically, aid from Sweden and the U.S. significantly enhanced growth in Somalia, whereas UK aid had no long-term effects.

Girma and Tilahun (2022), utilising the ARDL model for Ethiopia, found that aid had a significant long-term impact but no short-term effect. Edo et al. (2023) found that foreign aid significantly enhances economic growth in sub-Saharan Africa, though less so than domestic private investment and government expenditure, despite different estimation techniques. However, several studies have reported negative aid-growth relationships in Africa (Ogbonna et al., 2021; Gebresilassie et al., 2024), noting the detrimental effects of excessive aid on Nigeria's growth. Wako (2018) and Nwude et al. (2023) highlight the ambiguous impact of aid on growth in African countries.

The aid-growth nexus remains contentious, particularly in studies that use panel data with different estimation techniques, such as static and dynamic models. While several studies report a positive relationship between aid and growth in developing countries (Minoiu & Reddy, 2010; Janjua et al., 2018; Harb & Hall, 2019; Pham & Pham, 2020), others find negative effects (Kourtellos et al., 2007; Driffield & Jones, 2013; Hayaloglu & Tumay, 2023). Additionally, some studies reported mixed or ambiguous results (Yiew & Lau, 2018; Abate, 2022), and Neanidis (2012) found a neutral effect. Many studies emphasise conditional factors that influence the aid-growth relationship, such as the type of aid (Neanidis, 2012), income level of recipient countries (Harb & Hall, 2019), policy quality, institutional quality and economic freedom (Driffield & Jones, 2013; Abate, 2022; Yusuf & Fagbadebo, 2025; Akindele et al., 2026). Our understanding of the aid-growth nexus

suggests that no universal consensus exists on the effect of aid on growth, highlighting the need for a more unified framework or a more comprehensive understanding of the subject.

Domestic Investment, Trade Openness, Government Spending, and Economic Growth

Despite using different estimation methods, data sets, and countries, the relationship between domestic investment and economic growth has consistently been positive. Makuyana and Odhiambo (2017, 2019) and Younsi et al. (2021), using ARDL and system GMM, respectively, established a positive effect of domestic investment on economic growth in Malawi, Zimbabwe, and other African countries. This can also be seen in Asian studies, including Nguyen and Trinh (2018) and Nguyen et al. (2021), who affirmed the positive effect of domestic investment on economic growth using various econometric methodologies, such as fully modified OLS, dynamic OLS, and ARDL. Khan and Reinhart (1990) showed that domestic investment positively impacts economic growth in developing countries. A recent study by Husnain et al. (2024) also showed that both foreign and domestic investment have positive short- and long-run effects on the economic growth of Latin American countries. This finding suggests that there is no controversy regarding the impact of domestic investment on economic growth.

As with domestic investment, most recent empirical studies on the impact of trade openness on economic growth have found a positive and statistically significant effect of trade liberalisation policies in various developing countries. For instance, trade openness has been found to have a positive and significant impact on the economic growth of African countries (Keho, 2017), European countries (Pilinkiene, 2016; Jamel & Maktouf, 2017), Asian countries (Fan & Hossain, 2018; Banday et al., 2021) and the majority of countries around the world (Huchet-Bourdon et al., 2018; Majumder et al., 2020) while some have established mixed results (Hye & Lau, 2015) and bidirectional causality between the two (Sakyi et al., 2015; Lawal et al., 2016). However, the relationship between government expenditures and economic growth has been highly controversial, with various studies presenting diverging evidence. Although some studies (Chipaumire et al., 2014; Poku et al., 2022) have revealed a positive effect of government expenditure on economic growth, other studies (Onifade et al., 2020; Younsi et al., 2021) have reported negative effects. Moreover, Saez et al. (2017) found a neutral effect across European countries, whereas Babatunde (2018) and Selvanathan et al. (2021) reported mixed effects of government expenditure on economic growth in Sri Lanka. This suggests that the impact of government expenditure on a country's economic growth may be context-dependent and contingent on the efficiency of the governmental parastatals responsible for it, as well as on the time lag between government spending and growth.

Material and Methods

Econometric Model Specification

This study adopts the extended Cobb-Douglas production function (Omri et al., 2014; Abdouli & Hammami, 2017). The Cobb-Douglas production function is commonly used in microeconomics to estimate firms' output in terms of total factor productivity (TFP), labour, and capital. However, recent empirical studies have adopted it to measure countries' economic output and growth (Olumuyiwa, 2013; Abdouli & Hammami, 2017). Although this production function was used to examine the impact of CO2 emissions and FDI inflows on economic growth, this study focuses on FDI inflows, foreign aid, and domestic investment. Therefore, the production function is specified in eq. 1: $Y = e^{\varepsilon} AK^{\beta_1}(FDI)^{\beta_2}(FA)^{\beta_3}X^{\beta_4}$ 1

Where Y is real per capita GDP, A is TFP, K is domestic investment (gross fixed capital formation, % of GDP), FDI is foreign direct investment inflows (% of GDP), FA is foreign aid, X is the vector of control variables, ε is the error term, and $\beta_1 - \beta_4$ are production elasticities of their associated variables. This augmented production function is thus subject to a log transformation, as given in eq. 2, to maintain the same measurement unit. In addition, it is assumed that the production function exhibits constant returns to scale,

that is, $\beta_1 + \beta_2 + \beta_3 + \beta_4 = 1$, such that $\beta_4 < 1$ and is the sum of all elasticities of other control variables included in vector X.

$$ln\,Y = \varepsilon lne + lnA + \beta_1 lnK + \beta_2 lnFDI + \beta_3 lnFA + \beta_4 lnX \quad (2)$$

Let $\delta = l\text{nA}$, and $\ln K_{it} = \ln(DI)_{it}$ then eq. 3 is specified as follows:

$$ln\,Y = \delta + + \beta_1 ln(DI) + \beta_2 lnFDI + \beta_3 lnFA + \beta_4 lnX + \varepsilon \quad (3)$$

Eq. 3 can thus be rewritten in panel data form for estimation as

$$ln\,Y_{it} = \delta + + \beta_1 lnDI_{it} + \beta_2 ln\,FDI_{it} + \beta_3 ln\,FA_{it} + \beta_4 lnX_{it} + \varepsilon_{it} \quad (4)$$

where subscript $i = 1, \ldots, N$ represents the countries ($N = 66$) and $t = 1, \ldots, T$ indicates the period. Y represents the GDP growth rate, DI represents gross fixed capital formation, FDI represents FDI net inflows, FA is foreign aid, and X represents a vector of control variables comprising EDEX (education expenditure), INF (inflation), etc.

Estimation Technique

To estimate eq. 4, the study employs static panel-data estimation techniques. Specifically, fixed-effects (FE) and random-effects (RE) models account for the panel structure of the data and the unobserved heterogeneity across countries. The FE estimator controls for time-invariant unobserved country-specific characteristics that remain constant over the study period, thereby resolving endogeneity arising from correlation among variables (Hsiao, 2003; Mundiak, 1978; Wooldridge, 2010). The RE estimator, in contrast, incorporates both within- and between-country variation and treats the country-specific effects as random. The choice between the two models was based on the Hausman test (Hausman, 1978), which assesses whether the two estimators differ significantly (Verbeek, 2004). Nonetheless, to account for serial correlation, heterogeneity, and endogeneity in the models, a clustered robust standard error was estimated to address autocorrelation and heterogeneity in the explanatory variables (Baltagi, 2021).

Data

The dataset used covers 66 countries segmented into four different groups: transitioning economies (9), African developing countries (28), Asian developing countries (12), and Latin American and Caribbean developing countries (15). The dataset covers three decades, from 1993 to 2022. The selection of countries and periods was based on the availability of data from the World Bank Development Indicator database, and all variables were averaged over the sample period. The descriptive statistics for the four panels show that, on average, between 1993 and 2022, the highest growth rate of GDP is found within the Asian developing countries, followed by African developing countries, while the lowest is found among the transitioning economies, 5.0797%, 4.6997%, and 3.1535%, respectively. It also shows that the economies of transitioning countries have the highest volatility, with a coefficient of variation (CV) of 2.5288, while those of other developing countries range from 0.6826 to 1.2275. This could be due to the high level of inflation among the transitioning economies, with an average inflation rate of 100.0418% and a CV of 4.4530, while countries in other developing regions have average inflation rates between 6.2336 and 17.7911, with CVs ranging from 1.1675 to 7.6631. However, on average, transitioning economies have the highest FDI net inflows, followed by Latin American and Caribbean countries, while developing Asian countries have the highest domestic investment and foreign aid inflows.

The preliminary results show that correlation values among the variables in the four panels are less than 0.7. For instance, within the transitioning economies panel, only the correlation between education and trade openness is highest at 0.5822, and the correlation between FDI and DI is 0.4890, below 0.7. These values are even lower in the subsequent panels, indicating no evidence of multicollinearity among the variables. **Results and Discussion**

As presented in Table 1, the results of the panel regression analysis using fixed- and random-effects models are divided into four panels, with each panel representing different economic regions: Transitioning Economies (panel 1), African Developing Countries (panel 2), Asian Developing Countries (panel 3), and Latin American & Caribbean Developing Countries (panel 3). Each panel contained two models: a baseline

model (odd-numbered) and a main model (even-numbered), with the latter adjusted for potential heteroskedasticity and serial correlation using clustered robust standard errors. From the distinguishing panel for Transitioning Economies, it can be deduced that DI, INF, and EDEX are the only variables with a statistically significant impact on economic growth at the 1% level, while FDI, AID, and TOPEN are not statistically significant at the 5% level. This indicates that for a 1% increase in DI, there is a corresponding 0.207% increase in economic growth, whereas a 1% increase in EDEX corresponds to a 1.534% decrease in economic growth in Model 2. This confirms earlier empirical results indicating that domestic investment positively affects economic growth (Younsi et al., 2021).

However, the impact of inflation seems to be minimal on the economic growth of transition economies, with a 1% increase in inflation corresponding to a 0.006% decrease in economic growth, which aligns with Younsi et al. (2021), who showed that a percentage increase in inflation leads to a 0.003% decrease in economic growth. The significance of the control variables was also reflected in the results of Model 1. The results from these two models indicate that domestic investment is key to improving economic growth, while high educational expenditure and inflation can hinder economic growth in transition economies. However, the effect of education expenditure can be deemed counterintuitive, as one would expect it to increase human capital development, which in turn enhances the skills of a nation's labour force and hence positively impacts economic growth. This aligns with the literature faction that hypothesised a negative effect (Onifade et al., 2020; Younsi et al., 2021) and contrasts with the optimistic view of government expenditure (Chipaumire et al., 2014; Poku et al., 2022). However, education expenditure is a recurrent expenditure, and if expended efficiently on empowering the population, its benefits do not immediately and directly translate into economic growth but rather indirectly through manpower supply.

From the distinguishing panel for African Developing Countries, it can be deduced that only FDI emerges as a significant driver of economic growth, with a positive and statistically significant coefficient, indicating that a 1% increase in FDI is associated with a 0.114% increase in economic growth in African countries. This aligns with previous empirical findings on the FDI-led growth hypothesis, which indicate that FDI has a positive and significant effect on economic growth in African countries (Younsi et al., 2021; Wondimu, 2023; Akinola & Ohonba, 2024; Mahfoudi et al., 2024). It contrasts with the negative, neutral, and ambiguous effects identified in the literature (Azman-Saini et al., 2010b; Benetrix et al., 2023; Zadoub & Sboui, 2023). Moreover, the positive effect of AID is not statistically significant at the 5% level, although its positive effect aligns with previous empirical studies on African countries (Younsi et al., 2021; Girma & Tilahun, 2022; Asaleye et al., 2023; Edo et al., 2023; Ehigiamusoe et al., 2024).

The panel results indicate the critical role of non-concessional external capital, particularly foreign direct investment (FDI), in enhancing economic growth in African countries. In contrast, domestic factors, such as trade openness, education expenditure, and inflation, are less significant. This challenges the premises of the endogenous growth model and the Big Push Theory, which hold that economic growth primarily stems from internal sources. While institutional factors may also play a role in this discrepancy, the results reveal that external finance seems particularly relevant for Africa, where many nations struggle with poverty and lack local financial resources necessary for sustainable growth.

In the distinguishing panel for Asian Developing Countries, the results of the random-effects model suggest that EDEX, DI, and FDI have significant effects on economic growth, whereas TOPEN, INF, and AID have insignificant effects. However, only EDEX has a negative and significant effect, indicating that a 1% increase in education spending reduces economic growth in Asian countries by 0.608%, consistent with Younsi et al. (2021). This result suggests that education expenditure in Asian countries may be inefficient, or that the benefits of such spending take longer to materialise.

Furthermore, DI has a positive and significant effect on economic growth, meaning that a 1% increase in domestic investment leads to a corresponding 0.168% increase in the economic growth of Asian countries. This aligns with findings from existing studies indicating that domestic investment positively affects economic growth in developing countries in Asia (Nguyen & Trinh, 2018; Nguyen et al., 2021). Similarly, a percentage increase in net FDI inflows in Asian countries increases growth by 0.480%. This finding aligns with the

majority of empirical evidence suggesting the existence of FDI-led growth in Asian countries (Hussain & Haque, 2016; Sothan & Zhang, 2017; Sarker & Khan, 2020; Alam et al., 2024; Fazaalloh, 2024; Shadab & Alam, 2024; Sharmiladevi, 2024) while it contradicts fewer studies suggesting otherwise (Gunby et al., 2017; Tran et al., 2023). This implies that the FDI-led growth hypothesis is quite relevant among Asian countries, as it is for African countries.

The results presented in the distinguishing panel for Latin American & Caribbean Developing Countries suggest that only DI has a statistically significant positive effect on economic growth, whereas FDI and AID have no statistically significant impact. On average, a 1% increase in domestic investment leads to a 0.360% increase in economic growth, which affirms studies emphasising the positive effect of DI on economic growth (Mkuyana & Odhiambo, 2017; Makuyana & Odhiambo, 2019; Husnain et al., 2024). However, all control variables (TOPEN, EDEX, and INF) have statistically significant effects on the economic growth of these countries. This was also confirmed in previous studies (Sakyi et al., 2015; Huchet-Bourdon et al., 2018; Banday et al., 2021). This implies that a 1% increase in TOPEN leads to a 0.055% increase in economic growth, indicating that higher levels of trade openness significantly boost economic growth in this region. In contrast, education expenditure has a significantly negative coefficient, indicating that a 1% increase in recurrent education expenditure reduces economic growth by 1.018%, as evidenced by Younsi et al. (2021) and Onifade et al. (2020). This result is consistent with other regions, where education expenditure appears to have a short-term negative impact, possibly due to inefficiencies or delayed returns.

Conclusion

This study analysed the determinants of economic growth across four distinct economic regions: Transitioning Economies, African Developing Countries, Asian Developing Countries, and Latin American & Caribbean Developing Countries. Utilising both fixed- and random-effects panel regression models, with adjustments for heteroskedasticity and serial correlation via clustered robust standard errors, the study provides insights into the varying impacts of domestic and external factors on economic growth across these regions. Across all panels, except Africa, domestic investment (DI) consistently emerged as a key driver of economic growth, reaffirming the importance of fostering internal capital accumulation for economic advancement. This finding aligns with previous studies (Nguyen et al., 2021; Younsi et al., 2021) that emphasise the critical role of domestic resources in driving growth, particularly in developing and transitioning economies. The significant positive effect of DI across all regions highlights the need for policies that support domestic capital formation through incentives, infrastructure, and a stable macroeconomic environment.

Conversely, foreign aid (AID) has a significant effect, but only for African countries. While FDI had a significant positive impact on growth in African, Asian countries and transition economies, its effect was insignificant in Latin American & Caribbean countries. The positive findings for Africa and Asia support the FDI-led growth hypothesis (Azman-Saini et al., 2010a; Makiela & Ouattara, 2018; Younsi et al., 2021; Wondimu, 2023; Akinola & Ohonba, 2024), suggesting that FDI can act as a catalyst for economic growth in regions with conducive institutional and economic environments. However, the lack of significance in other regions suggests that the impact of FDI may be contingent on local factors, such as governance, economic stability, and the absorptive capacity of the host economies. Education expenditure (EDEX), which is expected to boost human capital and long-term growth, showed a surprising negative effect on economic growth in all regions except Africa. This may reflect inefficiencies in spending, where recurrent expenditures do not immediately translate into growth, suggesting that educational investments take time to yield benefits. Policy reforms should focus on improving the quality and efficiency of educational spending to ensure sustainable growth. Inflation (INF) had a weak negative impact on growth, except in Africa, where it was not significant. However, it is difficult to conclude that high inflation erodes economic growth by distorting price signals and reducing investment and consumer purchasing power.

Recommendations

Governments in transitioning economies, Asia, and Latin America and the Caribbean should strengthen incentives for domestic investment through improved access to credit, reliable electricity, and transport infrastructure. In Africa, where domestic investment was not statistically significant, governments should assess the constraints preventing domestic capital formation from translating into economic growth. African countries should direct foreign aid towards projects with measurable economic benefits, particularly in infrastructure, agricultural productivity, and essential public services. Regular monitoring and evaluation should be used to assess whether aid-funded projects improve productivity and contribute to economic growth.

Governments in Africa, Asia, and transitioning economies should maintain predictable investment regulations, improve contract enforcement, and reduce unnecessary administrative barriers to attract and retain foreign investors. In Latin America and the Caribbean, policymakers should assess the sectors receiving FDI and the extent to which foreign investment contributes to domestic production and employment. Since education expenditure was negatively associated with economic growth in all regions except Africa, governments should review how education budgets are allocated and spent. Greater attention should be given to teacher availability, learning outcomes, technical and vocational training, and skills that meet labour market needs. This would help ensure that education spending contributes more directly to workforce productivity. Governments should monitor inflation and address its underlying causes through appropriate monetary and fiscal policies. Particular attention should be given to avoiding excessive public spending that adds to inflationary pressures and to reducing supply constraints in essential goods. These measures can help protect investment and household purchasing power while supporting economic growth.

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Table 1: Fixed-effect and random-effect estimation panels

Variables	Transitioning Economies		African countries		Asian countries		Latin American & Caribbean countries	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TOPEN	0.063** (0.026)	0.052* (0.027)	0.042 (0.028)	0.006 (0.018)	0.003 (0.009)	-0.007 (0.007)	0.060*** (0.015)	0.055** (0.017)
EDEX	-1.817*** (0.305)	-1.534*** (0.396)	-0.161 (0.244)	-0.092 (0.129)	-0.608*** (0.263)	-0.640*** (0.213)	-1.018** (0.340)	-1.151*** (0.280)
INF	-0.006*** (0.001)	-0.006*** (0.002)	-0.037 (0.029)	-0.020 (0.026)	-0.064*** (0.024)	-0.052* (0.025)	0.001*** (0.0002)	0.001** (0.0003)
DI	-	0.207*** (0.056)	-	0.020 (0.040)	-	0.168*** (0.036)	-	0.360** (0.129)
FDI	-	0.147* (0.064)	-	0.114** (0.044)	-	0.480*** (0.137)	-	0.164 (0.135)
AID	-	0.083 (0.806)	-	0.515* (0.278)	-	0.064 (0.101)	-	-0.152 (0.195)
Constant	5.675*** (1.6252)	-1.859 (10.170)	-	-7.160 (5.758)	7.510*** (0.856)	1.496 (2.880)	-	-
Hausman test p-value	0.8984	0.6828	0.0310**	0.3439	0.8885	0.8879	0.0432**	0.0000***
F-statistic	67.847***	98.383***	3.328**	20.018***	18.472***	63.590***	14.286***	15.862***
R^2	0.203	0.275	0.012	0.023	0.049	0.172	0.090	0.184
Observations	270	267	840	839	360	331	450	442
Number of countries	9	9	28	28	12	12	15	15

Note: $p < 0.1$ *, $p < 0.05$ **, $p < 0.01$ ***; clustered robust standard errors are in parentheses.