

THE MODERATING ROLE OF GOVERNANCE INDICATORS IN THE EFFECT OF FOREIGN DIRECT INVESTMENT AND MILITARY EXPENDITURE ON ECONOMIC GROWTH IN LOW-INCOME COUNTRIES

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Abstract

This study examines the effect of Foreign Direct Investment (FDI) and military expenditure on economic growth and the moderating role of governance indicators in low-income countries. Economic growth is measured using annual GDP growth (%), while governance quality is represented by Voice and Accountability, Control of Corruption, and Regulatory Quality. Using panel data from low-income countries during 2002–2024, this study applies the Random Effect Model (REM) with robust standard errors. The results indicate that FDI has a positive but insignificant effect on economic growth, whereas military expenditure has a positive and marginally significant effect. Voice and Accountability strengthens the relationship between FDI and economic growth, while Control of Corruption weakens it. Regulatory Quality does not significantly moderate the effect of FDI but marginally strengthens the relationship between military expenditure and economic growth. These findings suggest that governance quality plays an important role in supporting economic growth in low-income countries.

Keywords: Foreign Direct Investment, Military Expenditure, Economic Growth, Governance Indicators, Low-Income Countries.

Abstrak

Penelitian ini menganalisis pengaruh *Foreign Direct Investment* (FDI) dan *military expenditure* terhadap pertumbuhan ekonomi serta peran moderasi indikator tata kelola pemerintahan di negara berpendapatan rendah. Pertumbuhan ekonomi diukur menggunakan pertumbuhan PDB tahunan (%), sedangkan kualitas tata kelola direpresentasikan oleh *Voice and Accountability*, *Control of Corruption*, dan *Regulatory Quality*. Penelitian ini menggunakan data panel negara berpendapatan rendah periode 2002–2024 dengan metode Random Effect Model (REM) dan *robust standard errors*. Hasil penelitian menunjukkan bahwa FDI berpengaruh positif namun tidak signifikan terhadap pertumbuhan ekonomi, sedangkan *military expenditure* berpengaruh positif dan signifikan marginal. *Voice and Accountability* memperkuat hubungan antara FDI dan pertumbuhan ekonomi, sementara *Control of Corruption* memperlemahnya. *Regulatory Quality* tidak memoderasi pengaruh FDI secara signifikan, tetapi memperkuat secara marginal hubungan antara *military expenditure* dan pertumbuhan ekonomi. Temuan ini menunjukkan bahwa kualitas tata kelola berperan penting dalam mendukung pertumbuhan ekonomi di negara berpendapatan rendah.

Kata Kunci: Foreign Direct Investment, Military Expenditure, Pertumbuhan Ekonomi, Indikator Tata Kelola, Negara Berpendapatan Rendah.

1. Introduction

Economic growth in low-income countries remains a central concern in development economics, particularly regarding the roles of foreign capital and government expenditure. Foreign direct investment (FDI) has long been regarded as a critical driver of growth by augmenting the domestic capital stock, facilitating technology transfer, and improving total factor productivity (TFP). Alongside FDI, military expenditure represents a significant and often growing component of government spending in many developing nations. Yet the consequences of military spending for growth remain contested, with some scholars highlighting demand-side stimulation effects while others emphasize its tendency to crowd out

productive investment. Within the Solow–Swan neoclassical growth framework (Solow, 1956; Swan, 1956), both FDI and military expenditure operate through the capital accumulation channel, making their interaction and relative magnitudes particularly consequential for low-income economies where capital is most scarce.

Empirical evidence on these relationships points to important nuances. Saha et al. (2022), examining 28 lower-middle-income countries over 2002–2018, demonstrate that institutional quality indicators, particularly regulatory quality and control of corruption, significantly condition FDI inflows, with governance effects operating nonlinearly depending on a country's level of economic development. Chang et al. (2011), using a dynamic panel Granger-causality approach across 90 countries, find that military expenditure has a significant negative effect on growth specifically in low-income panels, consistent with the crowding-out hypothesis. Rahman et al. (forthcoming) further show that military spending directly reduces inward FDI and moderates the structural conditions including per capita income and health expenditure, that would otherwise attract foreign investors in low-income and lower-middle-income economies.

Despite these contributions, a critical gap persists in the literature. Saha et al. (2022) examine governance as a determinant of FDI inflows but do not test whether institutional quality moderates the effect of FDI on economic growth. Chang et al. (2011) establish the military, growth nexus for low-income countries but exclude governance indicators and FDI from their model. Rahman et al. (forthcoming) position military expenditure as a moderator of FDI outcomes but treat governance as a control variable and focus on FDI attraction rather than growth as the ultimate outcome. Consequently, no existing study simultaneously examines whether governance quality moderates the growth effects of both FDI and military expenditure within a unified empirical framework, particularly in the context of low-income countries where capital scarcity and institutional deficiencies are most acute.

This study addresses that gap by embedding World Governance Indicators (WGI) dimensions as explicit moderating variables through governance \times FDI and governance \times military expenditure interaction terms in a panel growth model for low-income countries. Grounded in the Solow–Swan framework, governance is operationalized as a proxy for TFP (A), capturing the efficiency with which capital inputs are allocated and utilized. The central objective is to determine whether and how governance quality conditions the effects of FDI inflows and military expenditure on economic growth, thereby providing policy-relevant evidence on the institutional prerequisites for productive capital absorption in low-income settings.

2. Literature Review

This literature review is organized into two sub-sections: the Solow–Swan neoclassical growth model as the theoretical foundation, and the integrated review of FDI, military expenditure, institutional quality, and economic growth. These themes are grounded in three key source journals: Saha et al. (2022), Chang et al. (2011), and Rahman et al. (forthcoming).

2.1 Theoretical Foundation: The Solow–Swan Growth Model

The theoretical backbone of this study is the Solow–Swan neoclassical growth model (Solow, 1956; Swan, 1956), which explains long-run economic growth through the accumulation of productive inputs. In its standard form, aggregate output (Y) is a function of capital (K) and labor (L):

$$Y = f(K, L)$$

This study focuses on the capital dimension of the production function. FDI inflows serve as a proxy for foreign capital augmenting the domestic capital stock (K), while military expenditure represents a form of government spending that competes with productive capital formation. Additionally, the model incorporates total factor productivity (A) in the Cobb-Douglas specification:

$$Y = A \cdot K^\alpha \cdot L^{(1-\alpha)}$$

In this study, governance indicators serve as proxies for A. Strong institutions improve the efficiency with which capital, including foreign capital from FDI is allocated and utilized, thereby raising TFP and supporting growth. It is through this TFP channel that governance is hypothesized to moderate the growth effects of both FDI and military expenditure, which constitutes the central argument of this paper.

2.2 FDI, Military Expenditure, Institutional Quality, and Economic Growth

FDI promotes growth by augmenting capital and improving TFP through technology transfer and managerial spillovers, but its effectiveness depends on host-country institutions. Saha et al. (2022) show that control of corruption and regulatory quality significantly enhance FDI inflows in lower-middle-income countries, with threshold effects indicating that governance benefits are conditional on minimum

levels of economic development. Military expenditure, by contrast, exerts a significant negative effect on growth in low-income countries by crowding out productive investment (Chang et al., 2011) and directly reducing FDI inflows (Rahman et al., forthcoming). Despite these contributions, no existing study simultaneously tests whether governance moderates the growth effects of both FDI and military expenditure in a unified model, the gap this study addresses by embedding WGI dimensions as explicit interaction terms in a panel growth model for low-income countries.

2.3 Conceptual Framework

Based on the Solow–Swan framework, this study positions FDI and Military Expenditure as the key independent variables affecting Economic Growth, moderated by three WGI dimensions: Voice and Accountability, Control of Corruption, and Regulatory Quality. Governance quality acts as a proxy for TFP (A), determining the efficiency with which capital inputs generate growth. The moderating relationships are captured through governance \times FDI and governance \times Military Expenditure interaction terms in a panel growth model for low-income countries, as illustrated in Figure 1.

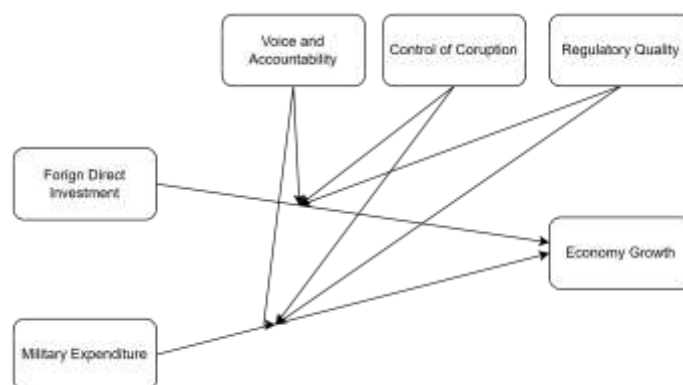


Figure 1. Conceptual Framework of the Study

2.4 Hypotheses

Based on the conceptual framework and the empirical evidence reviewed above, this study formulates the following six hypotheses:

H1: Foreign Direct Investment (FDI) has a positive and significant effect on economic growth in low-income countries.

H2: Military Expenditure has a positive and significant effect on economic growth in low-income countries.

H3: Voice and Accountability moderates the relationship between FDI and economic growth in low-income countries.

H4: Voice and Accountability moderates the relationship between Military Expenditure and economic growth in low-income countries.

H5: Control of Corruption moderates the relationship between FDI and economic growth in low-income countries.

H6: Control of Corruption moderates the relationship between Military Expenditure and economic growth in low-income countries.

H7: Regulatory Quality moderates the relationship between FDI and economic growth in low-income countries.

H8: Regulatory Quality moderates the relationship between Military Expenditure and economic growth in low-income countries.

3. Research Methods

3.1. Object, time and Place

The unit of analysis in this study is low-income countries, with the research focusing on the relationship between Foreign Direct Investment (FDI), military expenditure, and economic growth, as moderated by governance indicators. The study examines a macroeconomic phenomenon using panel data rather than individuals or organizations.

The data used in this research cover a 12-year period, from 2002 to 2024. The research setting is not a single physical location, but the selected low-income countries that serve as the sample of the study.

3.2. Data Collection Techniques

This study employs secondary data collected through documentation and literature review. The data were obtained from reliable international databases, including the World Bank and the Worldwide Governance Indicators (WGI) database developed by Kaufmann et al. (2010). The dataset covers Foreign Direct Investment (FDI), military expenditure, GDP growth, and governance indicators, namely Voice and Accountability, Control of Corruption, and Regulatory Quality.

3.3. Data Analysis Techniques

The data in this study were analyzed using panel data regression analysis to examine the direct effects of Foreign Direct Investment (FDI) and Military Expenditure (ME) on economic growth, as well as the moderating role of governance indicators. Panel data analysis was selected because it combines cross-sectional variation among countries and time-series variation over the study period, allowing the estimation results to be more efficient and reliable.

This study employs the Random Effect Model (REM) as the main estimation technique. The selection of REM was based on the Hausman test, which produced a probability value greater than the 5% significance level, indicating that the random effect approach is more appropriate than the fixed effect model. In addition, because heteroskedasticity was detected in the model, robust standard errors were applied to obtain consistent and unbiased estimation results.

To test whether multicollinearity exists among the independent variables, the Variance Inflation Factor (VIF) test was conducted. The results show that the model does not suffer from multicollinearity problems, as the mean VIF value remains below the threshold of 10.

The econometric model used in this study is formulated as follows:

$$\text{GDP Growth}_{it} = \beta_0 + \beta_1 \text{FDI}_{it} + \beta_2 \text{ME}_{it} + \beta_3 (\text{FDI} \times \text{VA})_{it} + \beta_4 (\text{FDI} \times \text{CC})_{it} + \beta_5 (\text{FDI} \times \text{RQ})_{it} + \beta_6 (\text{ME} \times \text{VA})_{it} + \beta_7 (\text{ME} \times \text{CC})_{it} + \beta_8 (\text{ME} \times \text{RQ})_{it}$$

Where:

GDP Growth_{it} = annual economic growth rate (GDP growth %) of country i at time t

FDI_{it} = Foreign Direct Investment

ME_{it} = Military Expenditure

VA_{it} = Voice and Accountability

CC_{it} = Control of Corruption

RQ_{it} = Regulatory Quality

i = country

t = year

ε_{it} = error term

Interaction terms between governance indicators and the main independent variables were included to capture the moderating effects of institutional quality on the relationship between FDI, military expenditure, and economic growth in low-income countries.

4. Results and Discussion

4.1. Research Results

This study employs panel data regression analysis using the Random Effect Model (REM) with robust standard errors to examine the impact of Foreign Direct Investment (FDI) and Military Expenditure (ME) on Gross Domestic Product (GDP), as well as the moderating role of institutional quality indicators, namely Voice and Accountability (VA), Control of Corruption (CC), and Regulatory Quality (RQ). The selection of REM was based on the Hausman test result, which showed a probability value of 0.1296 (> 0.05), indicating that the random effect model is more appropriate than the fixed effect model.

Before conducting the regression analysis, a multicollinearity test was performed using the Variance Inflation Factor (VIF). The result shows a Mean VIF value of 4.29, indicating that the regression model does not suffer from multicollinearity problems, as the value remains below the commonly accepted threshold of 10.

Table 1. Multicollinearity Test Result

Variable	VIF
Mean VIF	4.29

Sources: Author's calculation using Stata.

The result confirms that the explanatory variables included in the model do not exhibit strong linear relationships among themselves, implying that the estimated coefficients can be interpreted reliably.

Table 2. Hausman Test Result

Test	Probability Value
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Hausman Test

0.1296

Sources: Author's calculation using Stata.

The Hausman test result indicates that the probability value exceeds the significance level of 5%, suggesting that the Random Effect Model (REM) is the most suitable estimation method for this study.

Table 3. Random Effect Model Regression Results (Robust Standard Errors)

Variable	Coefficient (β)	Probability
FDI	0.0937	0.451
Military Expenditure (ME)	1.4667	0.053
FDI \times Voice and Accountability (VA)	0.4910	0.000***
FDI \times Control of Corruption (CC)	-0.5384	0.000***
FDI \times Regulatory Quality (RQ)	0.1870	0.145
ME \times Voice and Accountability (VA)	-0.4325	0.429
ME \times Control of Corruption (CC)	0.7538	0.238
ME \times Regulatory Quality (RQ)	1.3346	0.064*

Notes: *** significant at 1%; * significant at 10%

Sources: Author's calculation using Stata.

The regression results reveal that FDI has a positive but statistically insignificant effect on GDP ($\beta = 0.0937$; $p = 0.451$), implying that foreign investment alone does not significantly contribute to economic growth in low-income countries. Meanwhile, military expenditure shows a positive and marginally significant effect on GDP at the 10% significance level ($\beta = 1.4667$; $p = 0.053$). This suggests that military spending may contribute to economic performance, although the effect is relatively weak.

Regarding the moderating effects, Voice and Accountability (VA) significantly strengthens the relationship between FDI and GDP ($\beta = 0.4910$; $p = 0.000$), while Control of Corruption (CC) significantly weakens the relationship ($\beta = -0.5384$; $p = 0.000$). Regulatory Quality (RQ), however, does not significantly moderate the impact of FDI on GDP. In the case of military expenditure, only Regulatory Quality (RQ) exhibits a marginally significant moderating effect ($\beta = 1.3346$; $p = 0.064$), while Voice and Accountability (VA) and Control of Corruption (CC) remain statistically insignificant.

4.2. Discussion

The finding that FDI does not significantly affect GDP contradicts the conventional view that foreign investment promotes economic growth through technology transfer, capital accumulation, and employment generation. Previous studies suggest that the effectiveness of FDI largely depends on institutional quality and governance conditions in host countries (Saha et al., 2022). In low-income countries, weak institutions, poor infrastructure, and limited absorptive capacity may reduce the economic benefits generated by foreign investment.

Military expenditure demonstrates a positive and nearly significant relationship with GDP, which partially supports the Keynesian argument that defense spending can stimulate aggregate demand and economic activity through infrastructure development and increased public expenditure (Rahman et al., 2022). However, this result should be interpreted cautiously, as excessive military spending may also divert scarce resources away from productive sectors such as education, healthcare, and infrastructure development, potentially reducing long-term economic growth (Chang et al., 2011).

The significant positive moderating effect of Voice and Accountability (VA) on the relationship between FDI and GDP suggests that better democratic participation, transparency, and citizen freedom enhance the effectiveness of foreign investment in promoting economic growth. This result aligns with the argument that stronger institutional environments increase investor confidence and improve investment efficiency (Saha et al., 2022).

Conversely, the negative moderating effect of Control of Corruption (CC) on the relationship between FDI and GDP is an unexpected finding. One possible explanation is that in certain low-income countries, anti-corruption mechanisms may initially create stricter regulatory procedures, increasing transaction costs and reducing the immediate economic contribution of foreign investment. This finding differs from prior studies that generally identify corruption control as a factor that enhances FDI inflows and economic performance (Saha et al., 2022).

Furthermore, Regulatory Quality (RQ) does not significantly moderate the relationship between FDI and GDP, indicating that the effectiveness of market-friendly regulations alone may not be sufficient

to maximize the contribution of foreign investment to economic growth in low-income countries. However, RQ marginally strengthens the relationship between military expenditure and GDP, suggesting that effective regulations may improve the efficiency of military spending and its contribution to economic performance.

4.3. Relevance to Research Objectives

The findings of this study successfully address the research objective of examining the effects of FDI and military expenditure on economic growth and the moderating role of institutional quality in low-income countries. The results reveal that institutional factors matter in determining whether FDI and military spending contribute effectively to GDP growth. Specifically, Voice and Accountability strengthens the economic contribution of FDI, while Control of Corruption weakens it. Therefore, institutional quality should be considered an essential factor in designing development strategies and public expenditure policies in low-income countries.

5. Conclusion

This study shows that Foreign Direct Investment (FDI) does not have a statistically significant effect on economic growth in low-income countries, while military expenditure has a positive but only marginally significant effect. The moderating analysis also reveals that Voice and Accountability strengthens the relationship between FDI and economic growth, Control of Corruption weakens it, and Regulatory Quality does not significantly moderate it. For military expenditure, only Regulatory Quality shows a marginally significant moderating effect, while the other governance indicators are not significant. Overall, the results indicate that the effect of FDI and military expenditure on economic growth in low-income countries depends partly on governance quality.

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