

# Institutions and economic growth: the role of financial inclusion, public spending on education and the military

Institutions  
and economic  
growth

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## Abstract

**Purpose** – The paper aims to investigate the relationship between institutions and economic growth in developing countries, considering the role of financial inclusion, education spending and military spending.

**Design/methodology/approach** – The study employs dynamic panel analysis, specifically two-step system generalized method of moments (GMM), on a sample of 61 developing countries over the period 2009–2020.

**Findings** – The results confirm that weak institutional quality, weak financial inclusion and increased military spending are barriers to economic growth, conversely, increased spending on education and gross capital formation contribute to economic growth in developing countries. Regarding the specific institutional factor, we find that corruption, ineffective government, voice and accountability and weak rule of law contribute negatively to growth.

**Practical implications** – The study calls for strengthening institutions so that the financial system supports economic growth and suggests increasing spending on education to improve access to and the quality of human capital, which is an important determinant of economic growth.

**Originality/value** – The study contributes to scarce literature by empirically analyzing the relationship between institutions and economic growth by considering the role of financial inclusion, public spending on education and military spending, factors that have been ignored in previous studies. In addition, the study identifies the institutional dimension that contributes to reduced economic growth in developing countries.

**Keywords** Economic growth, Institutions, Financial inclusion, Military spending, Education spending

**Paper type** Research paper

## 1. Introduction

Economic growth is the main indicator of a country's economic stability, and it is no coincidence that it is the main macroeconomic objective (Abid, 2020; Alam *et al.*, 2022). Economic growth affects the performance of all economic sectors and the welfare of households and businesses, as it represents the economic productivity of the country, and is one of the main

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determinants of employment in the economy. Higher economic growth and decent work for families is an international concern expressed by the United Nations in the eighth (8th) sustainable development goal for agenda 2030. In view of this, understanding the factors that can influence or condition economic growth in developing countries arouses the interest of researchers, policy makers and society in general, due to the fact that it is an intertemporal phenomenon and with great importance for any nation. In this study, we intend to investigate the relationship between institutions and economic growth in developing countries, considering the role of financial inclusion, education spending, and military spending.

Institutions are a set of structures or organizations that govern the norms, rules, values and behavioral patterns of a society. However, it is widely understood that the difference in prosperity between countries is strongly explained by institutional structures, while a society's economic institutions are subordinate to its political institutions (Acemoglu and Robinson, 2010). Poor countries get out of poverty through good policies and improving their institutions (Glaeser *et al.*, 2004).

Financial inclusion is a broader manifestation of financial development, translated into easy access to financial products and services for all agents and without any discrimination related to gender, income, and other social conditions. Financial inclusion is a modern tool used for investment promotion, efficient allocation of financial resources, risk management, and promotion of economic well-being (Younas *et al.*, 2022). There is a strong acceptance that financial inclusion is an important driver of economic growth in developing countries (Ofoeda *et al.*, 2022). Empirical studies support that financial inclusion supports economic growth through credit accessibility, increased savings, increased entrepreneurship, reduced income inequality and poverty (Emara and El Said, 2021; Kebede *et al.*, 2023; Ofoeda *et al.*, 2022; Ouechtati, 2020), as well as increasing the effectiveness of monetary policies in controlling prices (Anarfo *et al.*, 2019; Jungo *et al.*, 2021) and increasing the financial stability of banks (Jungo *et al.*, 2022a).

The institutional environment is an important factor in stimulating investor confidence (Ofoeda *et al.*, 2022). Moreover, a developed and inclusive financial system capable of supporting the measures that converge to economic growth can be conditioned by the quality of institutions, as the financial system is very sensitive to risk, trust and transparency. The quality of institutions can ensure information sharing, enforcement and respect of contracts, facilitations of transactions and respect of property, and mitigates negative externalities (Bongomin *et al.*, 2018; Ofoeda *et al.*, 2022). Therefore, ensuring a deeper and more efficient financial system can be achieved by strengthening the institutions and regulatory framework (Ofoeda *et al.*, 2022; Ouechtati, 2022). Thus, it is clear that poor institutional quality while constituting a barrier to financial development is also a strong constraint on economic growth. Citizen involvement in the governance process, accountability and oversight of institutions, improvement in controlling corruption and promoting the rule of law, effectiveness in governance, and improvement in regulatory quality are necessary actions to ensure economic growth in developing countries (Ofoeda *et al.*, 2022). Empirical evidence supports that greater control of corruption relates positively to investment (Beyaert *et al.*, 2023), yet investment is a key factor for economic growth in any nation.

The relationship between public spending and economic growth is inconclusive, controversial, and contradictory (Alam *et al.*, 2022), however, economic theories that measure economic growth through demand argue that public spending can favor economic growth. Empirical studies relate public spending, government size and economic growth and conclude that it is the efficiency of public spending that matters most for economic growth (Alam *et al.*, 2022; Chu *et al.*, 2020; Trabelsi and Boujelbene, 2022), productive public spending is associated with higher levels of economic growth (Chu *et al.*, 2020). Furthermore, Barra and Ruggiero (2023) argue that strong institutions can improve the quality of public spending.

In this study, we consider education spending to be productive and efficient spending, and military spending to be inefficient, since Chu *et al.* (2020) classifies productive spending as spending that has an impact on production, and unproductive spending that has no impact on

production but serves to ensure the welfare of citizens. We understand that in countries where the quality of institutions is poor, governments neglect education and invest with the utmost rigor in military spending for protection and to remain in power indefinitely. Empirical research generally uses education to measure human capital, specifically the average years of schooling (Glawe and Wagner, 2022), therefore, human capital is a relevant factor in the analysis of economic growth and public spending on education is crucial to maintain human capital, on the other hand, education is fundamental for socioeconomic transformation of country, contributing considerably to efficient use of scarce resources and achieving rapid and consistent technological advancement and development (Alam *et al.*, 2022). Moreover, education is a powerful tool to control corruption (Asongu and Nwachukwu, 2015; Jungo *et al.*, 2023) and stimulates moral values which is fundamental for strengthening institutions.

Regarding military spending, Susilo *et al.* (2022) report that there is a positive relationship between political instability and military spending. Moreover, spending priorities may vary with the political cycle, with governments in election periods preferring social spending over military spending, and during left-wing government administration, social spending receives more attention, while in right-wing administration military spending tends to be higher (Bove *et al.*, 2017). Furthermore, empirical evidence confirms that high military spending contributes negatively to economic growth (Dunne and Nikolaidou, 2012).

There are a growing number of studies investigating the relationship between financial inclusion and economic growth, however, there are still few empirical studies that relate institutional quality, financial inclusion, and growth simultaneously, and the studies that do exist neglect the role of public spending. Thus, we contribute to the literature by empirically testing the relationship between institutional quality and economic growth, considering the role of financial inclusion, public spending on education and military, as well as, identifying the institutional dimension that contribute to reduced economic growth in developing countries. The study uses a comprehensive sample consisting of 63 developing countries and employs the dynamic panel econometric method (GMM), considering the possibility that the economic growth variable has endogeneity problems.

The result of dynamic panel estimation, specifically two-step system generalized method of moments confirm that weak institutions in developing countries contribute negatively to economic growth, moreover, weak financial inclusion and increased military spending are strong barriers to economic growth. On the other hand, the results confirm that government spending on education and increasing gross capital formation (investment) can contribute to increased economic growth in developing countries. Regarding specific institutional factors, weak control of corruption, ineffective government, voice and accountability, and weak rule of law contribute negatively to economic growth.

Regarding the practical implication, the study suggests increasing spending on education to improve access to and quality of human capital which is an important determinant for economic growth. As theoretical implication, the study shows that institutional environment is important factor for stimulating investor confidence and for efficient allocation of financial resources. As for policy implication, the study shows the need to strengthen institutions so that the financial system has the capacity to support economic productivity, specifically to improve control of corruption, government effectiveness, voice and accountability, and improve the rule of law.

The rest of the paper is organized in literature review in the next section, in the third section we present the methodology, where we describe the data and specify the model and in the fourth section we present and discuss the results, in the fifth and last section we conclude and present the implications.

## 2. Study background and definition of research hypotheses

The study of the role of institutions in explaining economic growth, considering the role of the quality of public spending and financial inclusion is based on the theory of good governance. In

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the theory of good governance, attention is paid to the role of government in promoting economic and social progress in the face of scarce resources (Hechmy, 2016; Huque and Jongruck, 2018; Omri and Afi, 2020), in addition, sustainability, inclusion and social well-being are the main characteristics of good governance (Eldomiaty *et al.*, 2020; Malik *et al.*, 2022).

Institutions are a set of structures or organizations that govern the norms, rules, values and behavioral patterns of a society. However, it is widely understood that the difference in prosperity between countries is strongly explained by institutional structures, while a society's economic institutions are subordinate to its political institutions (Acemoglu and Robinson, 2010). Poor countries get out of poverty through good policies and improving their institutions (Glaeser *et al.*, 2004).

### *2.1 Financial inclusion and economic growth*

Policymakers have the ability to use the banking system to promote economic growth, especially when it is consistent with their goals (Tian *et al.*, 2023), so there is growing evidence linking financial inclusion and economic growth. Daud and Ahmad (2023) examined the relationship between financial inclusion, digital technology, and economic growth and found that financial inclusion and digital technology positively and significantly impact economic growth. Chaudhry *et al.* (2023) also revealed positive effects of financial inclusion on economic growth in higher income OIC countries and opposite effects in lower income OIC countries. Ozili *et al.* (2023) found that financial inclusion, through the expansion of bank branches and the use of the Internet contribute favorably to economic growth. Younas *et al.* (2022) showed that financial inclusion has positive and significant effects on economic growth and the size of the shadow economy in developing countries reduces economic growth. Ofoeda *et al.* (2022) confirmed that financial inclusion promotes economic growth in African countries. Similarly, Emara and El Said (2021) confirm that financial inclusion positively impacts economic growth. Aziz (2020) found that macroeconomic stability and financial development improve economic growth in the Arab region.

Awad and Karaki (2019) analyzed the relationship between bank lending and economic growth in Palestine and found that economic growth positively influences bank lending, as well as, bank lending does not significantly influence economic growth and justify that the insignificant contribution of economic growth is attributed to the fact that banks do not lend to the productive sector of the economy due to high risk. Bara *et al.* (2016) established that financial development contributes negatively to economic growth and maintain that the structure of credit distribution and non-performing loans influenced the negative relationship. That said, we have defined the first research hypothesis:

*H1. Inclusive financial system sustains economic growth*

### *2.2 Military spending, education and economic growth*

Dunne and Nikolaidou (2012) confirmed that military spending does not promote economic growth. Alptekin and Levine (2012) confirmed the hypothesis of non-linearity between military spending and economic growth, the authors also confirmed the positive relationship between military spending and economic growth, but did not confirm the hypothesis that military spending reduces growth in the least developed countries. Similarly, Yildirim and Ocal (2016) showed empirically that military spending has a positive effect on economic growth. For India Abdel-khalek *et al.* (2020) found no causality between military spending and economic growth.

Goel and Saunoris (2014) relate military government spending and informal economy and found that countries with higher military spending have lower underground economy. Zhang *et al.* (2016) analyzed the causality between military expenditures and debt burden and

found unidirectional causality between military expenditures and debt burden in Portugal, Japan, and the United States, and unidirectional causality between debt burden and military expenditures in Canada, the United Kingdom, and bidirectional causality for Spain. In parallel, [Seitz et al. \(2015\)](#) confirm that reducing the cost of trade between countries reduces the probability of conflict and consequently reduces military spending; furthermore, the authors confirmed that reducing military spending contributes to the overall welfare of the country. Thus, the second research hypothesis is as follows:

*H2. Increased military spending hurts economic growth.*

[Wegari et al. \(2023\)](#) found that in the long run education spending and gross capital formation contribute positively and significantly to economic growth. [Glawe and Wagner \(2022\)](#) found that schooling and learning relate positively to economic growth, furthermore, they found that institutional quality and human capital act as perfect substitutes in the process of economic growth, maintaining that in countries where weak institutional quality, human capital ensures economic growth. [Alam et al. \(2022\)](#) observed that in the long run investment, export and government expenditure on education relate positively to economic growth, while, imports, government expenditure on health and other government expenditure showed negative relationship with economic growth. [Cristina et al. \(2023\)](#) investigate the impact of public spending on education on economic growth in Eastern European countries, former communist and current members of the European Union and found significant positive impacts in the short and long run between education spending and economic growth. [Gheraia et al. \(2021\)](#) also showed education spending increases economic growth in the short and long run. Education directly affects human capital and investment in education is beneficial for future employment ([Mehmetaj, 2022](#)). The third research hypothesis is presented below:

*H3. Increased spending on education boosts economic growth.*

### *2.3 Institutional quality and economic growth*

Weak institutions are sources of market inefficiencies, exclusion, weak competition and contributes to inefficient allocation of resources and weakens economic growth, however, countries with strong institutions have enjoyed high economic growth ([Chinoda and Kapingura, 2023](#)). Study by [Ofoeda et al. \(2022\)](#) revealed that the composite indicator of institutional quality, as well as, the specific indicators of institutional quality produce positive effects on economic growth through better resource mobilization, increased productivity, and poverty reduction. [Emara and El Said \(2021\)](#) showed that household financial access produces a positive impact on economic growth only in the presence of the quality institutions, namely supervisory and regulatory regime with rule of law support, judicial independence, contract enforcement, corruption control and political stability. [Ahmad and Law \(2023\)](#) have shown that regardless of geographic location, countries with similar institutional characteristics exhibit the same levels of economic growth. [Chinoda and Kapingura \(2023\)](#) certified that institutions and governance exert positive effects on the relationship between financial inclusion and economic growth. [Gyamfi et al. \(2022\)](#) demonstrated that in an environment with poor institutional quality, the effect of financial development on economic growth is negative. Similarly, [Asante et al. \(2023\)](#) found financial development positively impacts economic growth, so the effect is magnified when rule of law, political stability, and regulatory quality are highly effective. [Aziz \(2020\)](#) confirms that institutional quality has a positive impact on economic growth by favoring foreign direct investment.

[Kemoe and Lartey \(2022\)](#) showed that while increasing public debt has negative effects on economic growth, improving institutional quality and specifically, declining corruption and the perception of its negative effect can mitigate the effect of public debt on economic growth.

Regarding the effect of specific institutional factors, [Singha and Singh \(2022\)](#) confirm that political stability contributes to economic growth. [Trabelsi and Trabelsi \(2020\)](#) found that beyond the optimal threshold high and low corruption negatively impact economic growth. [Azam \(2022\)](#) showed that corruption negatively impacts economic growth, conversely, government effectiveness and political stability favor economic growth. [Singh \(2021\)](#) maintained that rule of law is the significant condition of governance enables poverty reduction. [Zhuo et al. \(2021\)](#) showed that rule of law, control of corruption, voice and accountability directly impact economic growth in developing countries and government effectiveness, political stability and regulatory quality indirectly affect economic growth. The last research hypothesis is as follows:

*H4.* The poor quality of institutions is a barrier to economic growth.

### 3. Methodology

#### 3.1 Description of the data

The study uses annual unbalanced panel data for 61 developing countries (See [Appendix](#)) over the period 2009–2020. The data are extracted from three different World Bank databases, namely World Governance Indicators (WGI), World Development Indicators (WDI), and Financial Development Indicators (GFI). Several empirical studies have used the same databases ([Jungo et al., 2022a, b, 2023](#); [Singh, 2021](#); [Tehulu, 2022](#); [Zhuo et al., 2021](#)). It is important to emphasize that the selection of the countries and period of study was conditioned by the greater availability of data on the variables under study.

The main variables of interest in the study are economic growth and institutions; therefore, economic growth was represented by the annual growth rate of gross domestic product (GDP), which is a widely used indicator in studies on economic growth in developing countries ([Abdel-khalek et al., 2020](#); [Asante et al., 2023](#); [Awad and Karaki, 2019](#); [Jungo et al., 2022a, b](#)). To represent institutions, the study uses six different indicators, specifically, government effectiveness, political stability and absence of violence, control of corruption, voice and accountability, regulatory quality, and rule of law ([Singh, 2021](#); [Tehulu, 2022](#); [Zhuo et al., 2021](#)).

In order to avoid the use of highly correlated variables in the estimations, we constructed an indicator of institutional quality that aggregates the six dimensions through the principal component analysis (PCA) technique. The six variables that make up the aggregate indicator of institutional quality were measured on a scale of 0 (Poor institutional quality) to 100 (Strong institutional quality). Corruption indicates how power is used for private gain ([Jungo et al., 2022a, 2023](#)). Political stability indicates the likelihood of politically motivated violence, terrorism, armed conflict occurring ([Singh, 2021](#); [Zhuo et al., 2021](#)). Rule of law refers to trust of households and businesses in public institutions and particularly the police and courts, reflecting in respect for social rules, private property, crime and violence ([Singh, 2021](#); [Tehulu, 2022](#)). Regulatory quality indicates the government's ability to formulate and execute policies, regulations that promote the emergence and development of private initiatives ([Ouechtati, 2022](#); [Tehulu, 2022](#)). Government effectiveness indicates the quality of public services, quality of civil service and its independence from political pressure also reflects the ability to formulate and implement policy and the credibility of the government's commitment to these policies. Whereas, Voice and accountability represents how well a country's citizens are able to participate in government selection, influence performance, as well as, represent freedom of speech, association and press ([Ouechtati, 2022](#); [Singh, 2021](#); [Tehulu, 2022](#)).

Respecting the multidimensionality of financial inclusion, we also created an aggregate indicator using the principal components analysis technique ([Jungo et al., 2021, 2022a, b](#);

Ofoeda *et al.*, 2022). The variables that make up the financial inclusion index are percentage of ATMs per 100,000 adults, percentage of bank accounts per 1,000 adults, percentage of bank branches per 100,000 adults, bank credit provided by the financial sector as a percentage of gross domestic product, bank deposits as a percentage of gross domestic product, Gross domestic savings as a percentage of gross domestic product (Jungo *et al.*, 2022a).

Governments can influence economic growth through public spending, to gauge this, we used two components of public spending such as public spending on education and military spending (Alam *et al.*, 2022; Chu *et al.*, 2020; Trabelsi and Boujebene, 2022). Expenditure on education was represented by total public expenditure on education as a percentage of gross domestic product and military expenditure we used total expenditure made by governments on military services and means as a percentage of gross domestic product (Abdel-khalek *et al.*, 2020; Zhang *et al.*, 2016).

We use gross capital formation as a percentage of gross domestic product to measure investment in the economy, as there is a strong relationship between investment and economic growth (Qamruzzaman and Jianguo, 2017; Wegari *et al.*, 2023). Economic growth in developing countries is greatly influenced by natural resources (Bara *et al.*, 2016), we use total natural resource revenues as a percentage of gross domestic product to gauge the effect of natural resources on economic growth. Kengdo (2023) showed that income from natural resources has a negative impact on economic growth in Cameroon.

Developing countries are characterized by high population growth rates, which is a factor that could be used favorably for economic growth if they provided people with the knowledge and skills that support quality human capital. Furthermore, Chaudhry *et al.* (2009) mentions that population size is an important determinant for governance. To investigate the effect of population size on economic growth we use the annual population growth rate.

Technological innovations used in developing countries rely heavily on Internet access (Jungo *et al.*, 2023). Internet access allows to solve the infrastructure barrier in implementing financial inclusion (Qamruzzaman and Jianguo, 2017). Thus, we use the percentage of individuals who use the Internet in the total population.

### 3.2 Model specification

In order to avoid the problem of multicollinearity, resulting from the use of highly correlated variables in the model, as well as the respect of the multidimensionality of the variable financial inclusion, we followed the descriptions suggested in Anarfo *et al.* (2020), Jungo *et al.* (2022a), Ongo Nkoa and Song (2022), Ouechtati (2022), Tehulu (2022) and we specify as follows the indicators of institutional quality and financial inclusion:

$$IQ_c = W_{c1}COC_1 + W_{c2}PS_2 + W_{c3}RL_3 + W_{c4}RQ_4 + W_{c5}GE_5 + W_{c6}VA_6 \quad (1)$$

$$IFI_P = W_{p1}ATM_1 + W_{p2}ACCOU_2 + W_{p3}BANK_3 + W_{p4}CRED_4 + W_{p5}DEP_5 + W_{p6}SAV_6 \quad (2)$$

where  $IQ_c$  and  $IFI_P$  represent the indicator of institutional quality and financial inclusion respectively, the  $W_{c/p}$  represent the weights of the variables included in the construction of each indicator. For the institutional quality indicator,  $COC$  represents the control of corruption,  $PS$  indicates political stability,  $RL$  represents the rule of law,  $RQ$  expresses regulatory quality,  $GE$  indicates the effectiveness of government and  $VA$  indicates voice and accountability. Financial inclusion indicators,  $ATM$  indicates the ATM number for each 100.000 adults,  $ACCOU$  represents the bank account per 1,000 adults,  $BANK$  indicates the total number of bank branches for each 100.000 adults,  $CRED$  means bank credit provided by the financial sector as a percentage of gross domestic product,  $DEP$  represents bank deposits

as a percentage of gross domestic product and *SAV* indicates gross domestic savings as a percentage of gross domestic product.

Considering that the data are unbalanced, as well as the possibility of endogeneity problems, serial autocorrelation, omission of variables and heteroscedasticity, the study employs the estimation technique of Generalized Moments Method System in two stages, which produces efficient estimates (Ngozi *et al.*, 2017; Tehulu, 2022). In this way our model is specified as follows:

$$GDP_{it} = \beta_0 + \beta_1 IQ_{it} + \beta_2 IFI_{it} + \beta_3 GEE_{it} + \beta_4 GEMIL_{it} + \beta_5 INV_{it} + \beta_6 NRES_{it} + \beta_7 POPG_{it} + \beta_8 NET_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (3)$$

where  $GDP_{it}$  represents economic growth,  $IQ_{it}$  indicates institutional quality,  $IFI_{it}$  expresses financial inclusion,  $GEE_{it}$  represents government spending on education,  $GEMIL_{it}$  is the expenditure of the military public,  $INV_{it}$  is the investment,  $NRES_{it}$  represents revenue from natural resources,  $POPG_{it}$  is the rate of population growth and  $NET_{it}$  is Internet access. The terms  $\mu_i$  and  $\delta_t$  represent the fixed effects of time and country respectively and  $\varepsilon_{it}$  represents the stochastic error.

## 4. Results and discussion

### 4.1 Pre-estimation

To prevent any bias, related to the measures of the variables, we applied natural logarithm in all the variables considered in the study. Previous studies by Ngozi *et al.* (2017) and Tehulu (2022) have proceeded in the same way. Supplementary Table 1 shows the results of the Kaiser–Meyer–Olkin (KMO) adequacy test, which serves to validate the use of institutional quality indicators and financial inclusion indicators. The KMO test values for financial inclusion were 62.6% and for institutional quality 85.6%, so it is appropriate to use the respective indicators (Boateng *et al.*, 2019; Jungo *et al.*, 2023).

The results of the descriptive statistics for the aggregate sample of 61 developing countries are shown in Supplementary Table 2, while for the sample broken down by continent they can be found in Supplementary Table 2.1. However, we can see that the average economic growth rate in the developing countries considered in the sample is only 1.45%, for Asian countries the average growth rate is 1.51%, higher than the average growth rate of African countries, which is 1.40%. As far as institutional factors are concerned, it can be seen that, on average, control of corruption, government effectiveness, political stability, voice and accountability, quality of regulation and the rule of law are weak, as they have averages of less than 50% for all the samples. With regard to financial inclusion, the main indicator of which is access to a bank account (Demirgüç-Kunt *et al.*, 2018; Zins and Weill, 2016), the average number of adults with access to a bank account in Asian countries is 402.63 per 1,000 adults, and only 312.34 in African countries. However, it can be concluded that although the levels of financial inclusion in the developing countries considered in the sample are low, Asian countries are more inclusive than African countries. In terms of the quality of spending, Asian countries spent an average of 1.43% of their GDP on education, while African countries spent an average of only 1.22%. In terms of military spending, African countries spent an average of 1.99% of their GDP, while Asian countries spent an average of only 0.90%.

The results of the correlation matrix are presented in Supplementary Table 3 and suggest that there is no evidence of multicollinearity problems, given that there was no such strong correlation between the variables used in the study. Converging with the multicollinearity test shown in Supplementary Table 5. However, we highlight the negative and significant correlation between economic growth and financial inclusion, economic growth and

institutional quality, economic growth and spending on education and military, economic growth and population growth.

In panel data analysis, it is critical to test for stationarity to avoid spurious regression (Anarfo *et al.*, 2019). The study employs two different tests to test the unit root of the variables, namely the Fisher-Augmented Dickey–Fuller (F-ADF) and Fisher–Philip–Perron (F-PP) test, these tests are appropriate for unbalanced panels (Levin *et al.*, 2002). The results presented in Supplementary Table 4, suggest that the variables are stationary or zero order integrated I(0).

#### 4.2 Estimation

Tables 1 and 2 present the results of the Two-step system generalized method of moments (GMM) estimation, the results of the post-estimation tests for first and second order serial

	(1) GDP	(2) GDP	(3) GDP	(4) GDP
L.GDP	0.313*** (0.002)	0.328*** (0.000)	0.326*** (0.000)	0.363*** (0.003)
IQ	−0.0818** (0.043)	−0.0447 (0.328)	−0.0549* (0.065)	−0.0438 (0.228)
IFI	−0.158** (0.041)	−0.139*** (0.000)	−0.148** (0.014)	−0.110** (0.031)
GEE		0.0188 (0.484)	0.0381 (0.249)	0.0535* (0.080)
GEMIL		−0.111*** (0.001)	−0.119** (0.012)	−0.128** (0.017)
INV			0.247** (0.020)	0.200* (0.071)
NRES			0.0112 (0.684)	0.00357 (0.875)
POPG				−0.0836** (0.045)
NET				−0.0412 (0.368)
_cons	1.027*** (0.000)	1.027*** (0.000)	0.196 (0.642)	0.579 (0.242)
N	575	438	399	398
F-statistic	245.65***	385.11***	478.09***	428.87***
Time dummy	yes	yes	yes	Yes
No of groups	61	49	45	45
No of instruments	47	27	29	42
AR(1)	−3.03*** (0.002)	−3.55*** (0.000)	−3.53*** (0.000)	−2.92*** (0.004)
p-value	0.01 (0.990)	−0.05 (0.957)	−0.15 (0.877)	−0.16 (0.875)
Sargan	52.30 (0.018)	10.42 (0.493)	10.03 (0.528)	22.20 (0.448)
Hansen J	37.99 (0.253)	8.04 (0.710)	12.79 (0.307)	24.36 (0.329)

**Note(s):** *p*-values in parentheses; \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01. Notes: GDP – Economic growth; L.GDP is the lag of economic growth; IQ–Institutional quality; IFI – Financial inclusion; GEE – Public spending on education; GEMIL – Military expending; INV – Investment; NRES – Natural resources; POPG – Population growth rate; NET – Internet access

**Source(s):** The author’s own elaboration

**Table 1.**  
Institutional quality  
and economic growth

REPS

	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP
L.GDP	0.344*** (0.000)	0.334*** (0.001)	0.352*** (0.001)	0.340*** (0.001)	0.345*** (0.000)	0.340*** (0.000)
CRED	-0.0647 (0.396)	-0.0385 (0.663)	-0.0988 (0.257)	-0.0827 (0.325)	-0.0826 (0.270)	-0.0294 (0.709)
GEE	0.0509** (0.022)	0.0367 (0.189)	0.0583** (0.034)	0.0497* (0.058)	0.0695*** (0.008)	0.0394 (0.109)
GEMIL	-0.128*** (0.008)	-0.146*** (0.004)	-0.143*** (0.007)	-0.140*** (0.009)	-0.150*** (0.003)	-0.139*** (0.006)
INVE	0.218* (0.064)	0.174 (0.123)	0.181 (0.170)	0.183 (0.130)	0.180 (0.123)	0.199* (0.067)
NRES	0.00693 (0.791)	0.00531 (0.846)	0.00589 (0.808)	0.00311 (0.907)	-0.00474 (0.852)	0.00488 (0.856)
POPG	-0.113** (0.044)	-0.0978 (0.103)	-0.0983 (0.111)	-0.0936 (0.101)	-0.0974* (0.076)	-0.106* (0.060)
NET	-0.0253 (0.657)	-0.0358 (0.540)	-0.0445 (0.483)	-0.0417 (0.506)	-0.0552 (0.358)	-0.0366 (0.524)
COC	-0.0931* (0.072)					
GE		-0.105* (0.088)				
PS			-0.0332 (0.542)			
RQ				-0.0542 (0.250)		
VA					-0.0931* (0.080)	
RL						-0.121** (0.012)
_cons	0.929** (0.048)	1.121** (0.021)	1.022** (0.046)	1.020** (0.028)	1.174** (0.012)	1.042** (0.025)
N	398	398	398	398	398	398
F-statistic	278.22***	313.81***	219.65***	185.41***	219.65***	313.81***
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes
No of groups	45	45	45	45	45	45
No of instruments	42	42	42	42	42	42
AR(1)	-2.99*** (0.003)	-3.01*** (0.003)	-2.95*** (0.000)	-3.00*** (0.003)	-2.95*** (0.000)	-3.01*** (0.000)
AR(2)	-0.13 (0.918)	-0.10 (0.884)	-0.13 (0.907)	-0.12 (0.899)	-0.13 (0.922)	-0.10 (0.899)
Sargan	30.27* (0.097)	29.99 (0.100)	31.23* (0.076)	32.08* (0.092)	31.23 (0.119)	29.99 (0.112)
Hansen J	25.56 (0.267)	25.70 (0.229)	27.10 (0.211)	27.01 (0.207)	27.10 (0.265)	25.70 (0.271)

**Note(s):** *p*-values in parentheses; \* *p* < 0.10, \*\* *p* < 0.05, \*\*\* *p* < 0.01. Notes: GDP – Economic growth; L.GDP is the lag of economic growth; GEE – Public spending on education; GEMIL – Military expending; INV – Investment; NRES – Natural resources; POPG – Population growth rate; NET – Internet access; CRED – Bank credit; COC – Corruption Control; GE – Government Effectiveness; PS – Political stability; RQ – Regulatory quality; VA – Voice and accountability and RL – Rule of law

**Source(s):** The author's own elaboration

**Table 2.**  
Effects of specific indicators of institutional quality

autocorrelation, the SARGAN and Hansen J over-identification and instrument validity tests, are presented at the bottom of the tables and confirm that the models are correctly specified, that the estimates are efficient (Roodman, 2009). In Table 1, we consider the indicators of

institutional quality and financial inclusion created through principal component analysis (PCA) as factors explaining economic growth in the first model and in the following models we added two explanatory variables progressively. In Table 2, we consider as an indicator of financial inclusion only the supply of bank credit, as one of the factors that is most likely to boost economic activity, through the support of financing needs, in addition, we consider in each model a specific indicator of institutional quality, with the purpose of identifying the effect of specific indicators of institutional quality on economic growth. The results presented in Tables 1 and 2 suggest that the current behavior of economic growth is positively and significantly influenced by its past behavior.

The results presented in Table 1, confirms that weak institutional quality produces negative and statistically significant effect on economic growth. Meaning that weak institutions in developing countries are a strong barrier to economic growth. These results are justified by the fact that weak institutions are sources for market inefficiency, facilitate social and financial exclusion, weaken competitiveness, encourage investment and human capital flight, discourage private initiative, favor the detour of public funds, and weaken the quality of public spending. This result corroborates the findings found in Chinoda and Kapingura (2023) and Ofoeda *et al.* (2022) who maintain that strong institutions have a positive effect on economic growth through better mobilization of financial resources, increased productivity, and poverty reduction.

Table 1 shows that poor financial inclusion has negative effects on economic growth in developing countries. These results are justified by the inefficient allocation of loans, as most of the population does not have access to the financial system and are unable to acquire financing to support needs such as entrepreneurship, education, and health. Our results confirm the results found by Awad and Karaki (2019) who showed that bank loans do not support economic growth in Palestine and justify that the financial sector does not sustain the financial needs of the productive sector. As well as, the study by Bara *et al.* (2016) who maintain that financial development produces negative effects on economic growth, due to capital allocation structure. The other factor that may be influencing the negative relationship between financial inclusion and growth, certainly is the weakness of institutions, which may favor moral hazard (Tehulu, 2022), as well as, reduced loan supply by poor contract enforcement, lack of transparency, political risk and corruption (Gani and Rasul, 2020; Sanga and Aziakpono, 2022).

The results also suggest that an increase in military spending produces negative effects on economic growth (Tables 1 and 2). This result can be supported by the fact that military expenditures are unproductive, or have no direct impact on economic productivity, as stated (Chu *et al.*, 2020). Our results, coincide with those presented by Dunne and Nikolaidou (2012) who confirmed that military spending does not favor economic growth and contradicts the result found by Yildirim and Öcal (2016) who found positive effects of military spending on economic growth. Furthermore, our results can be supported by the evidence found by Zhang *et al.* (2016) which confirms that increase in military spending positively relates to increase in debt and Seitz *et al.* (2015) reduction in military spending can increase the overall welfare of the country.

As expected, the results confirm that government spending on education increases economic growth. This can occur for several reasons, the first is that spending on education can be considered as a productive expenditure, since labor is a primary factor for production (Chu *et al.*, 2020), second, increasing access and year of schooling relates to the availability and quality of human capital (Mehmetaj, 2022). This result is in line with the studies conducted by (Alam *et al.*, 2022; Cristina *et al.*, 2023; Gheraia *et al.*, 2021; Glawe and Wagner, 2022; Wegari *et al.*, 2023) which showed that spending on education positively impacts economic growth. The result confirms that increased investment contributes positively and significantly to economic growth. Confirming the evidences described in (Qamruzzaman and

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Jianguo (2017) and Wegari *et al.* (2023) which support that increase in gross capital formation is relevant for economic growth.

In terms of specific institutional factors, weak control of corruption, government ineffectiveness, voice and accountability, and weak rule of law contribute negatively to economic growth. Consistent with the study of Zhuo *et al.* (2021) who found that among the institutional factors corruption control, rule of law, voice and accountability and government effectiveness are the dimensions that directly affect economic growth, furthermore, Azam (2022) and Trabelsi and Trabelsi (2020) maintain that corruption reduces economic growth, while Singh (2021) shows that rule of law is the institutional dimension that contributes to poverty reduction.

To test the robustness of the results, we used financial inclusion and institutional quality separately in the model, as well as an interaction term resulting from multiplying financial inclusion and institutional quality. However, the results confirm that weak financial inclusion and poor institutional quality have a negative impact on economic growth, and that there is a joint negative effect of financial inclusion and institutional quality on economic growth (See Supplementary Table 6).

*4.2.1 Discussion of results and implications.* The results confirm that financial inclusion has a negative and statistically significant effect on economic growth. This result indicates that poor access to the financial system in developing countries has weakened economic growth. This may be due to the poor development of the financial system, the high costs of financial products and services and weak competition (Bara *et al.*, 2016; Bara and Mudzingiri, 2016). Regarding the effect of institutional quality, we found that poor institutional quality has a negative and statistically significant effect on economic growth. This result supports the theoretical and empirical evidence that weak institutions are important barriers to economic growth and progress (Acemoglu and Robinson, 2010; Awad and Karaki, 2019; Glaeser *et al.*, 2004). The results found support that the poor quality of institutions contributes to an increase in moral hazard, weakens transparency and increases political risk, thus undermining the importance of the financial sector in sustaining economic growth (Gani and Rasul, 2020; Sanga and Aziakpono, 2022; Tehulu, 2022). On the other hand, poor institutional quality can weaken economic growth through the quality of spending (Barra and Ruggiero, 2023). In countries where the quality of institutions is poor, governments spend a lot on military expenditure in order to preserve power. Military spending is unproductive and negatively impacts economic growth (Chu *et al.*, 2020; Dunne and Nikolaidou, 2012), on the other hand, increased military spending is positively related to increased public debt and reduces a country's wealth (Seitz *et al.*, 2015; Yildirim and Öcal, 2016; Zhang *et al.*, 2016).

The practical and social implication of this study is to reconsider the role of governance in economic growth, showing that the poor quality of institutions is a strong barrier to economic growth, weakening investor confidence, as well as contributing to the inefficient allocation of scarce resources. In terms of political implications, the study highlights the need for policymakers to: (1) strengthen institutions, so that the financial sector supports economic growth; (2) create public policies that favor financial inclusion, so that the poor and marginalized population and micro-enterprises contribute to economic growth; (3) improve the quality of public spending, giving priority to productive spending; (4) Prioritizing spending on education, to improve access to and the quality of education, bearing in mind that human capital is the main determinant of economic growth; (5) The study highlights the need to improve corruption control, government effectiveness, voice and accountability, and improve the rule of law.

## 5. Conclusions and implications

We consider in this study, that institutions are all public organizations that carry out governmental duties and obligations, such as, ministries and courts (Chinoda and Kapingura,

2023), which converge for efficient allocation of scarce resources. The present study, contributes to scarce literature by empirically analyzing the relationship between institutions and economic growth in developing countries by considering the role of financial inclusion, public expenditure on education and military expenditure, as well as, identifies the institutional dimension that contributes to reduced economic growth. The result of dynamic panel estimation, specifically two-step system generalized method of moments confirm that weak institutions in developing countries contribute negatively to economic growth, moreover, weak financial inclusion and increasing military expenditure are strong barriers to economic growth. On the other hand, the results confirm that government spending on education and increasing gross capital formation (investment) can contribute to increased economic growth in developing countries. Regarding specific institutional factors, weak control of corruption, ineffective government, voice and accountability, and weak rule of law contribute negatively to economic growth.

The study is limited to empirically analyzing the relationship between institutional quality, financial inclusion and economic growth, considering the quality of public spending on education and the military in developing countries, due to the fact that these are concrete problems in these countries, although they may exist in the context of developed countries, they are more pronounced in developing countries. However, as a future study, we suggest using the same approach and carrying out a comparative study between different contexts (developing and developed countries). The study also limited itself to using the measures of governance established by the World Bank, due to the greater availability of data, but the time series of this data was too short to carry out a short- and long-term study. As such, we suggest that a future study should analyze the relationship between institutions and economic growth, considering education and military spending through short and long-term methodology.

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(The Appendix follows overleaf)

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Afghanistan	Eswatini	Malaysia	Seychelles
Angola	Ethiopia	Mauritania	Sierra Leone
Armenia	Ghana	Mozambique	South Africa
Bangladesh	Guinea	Myanmar	Sri Lanka
Benin	India	Nepal	Tajikistan
Bhutan	Indonesia	Niger	Timor-Leste
Botswana	Jordan	Nigeria	Togo
Burkina Faso	Kazakhstan	Oman	Tunisia
Burundi	Kenya	Pakistan	Turkmenistan
Cabo Verde	Kuwait	Philippines	Uganda
Cambodia	Kyrgyz Republic	Qatar	United Arab Emirates
Cameroon	Lebanon	RDC	Uzbekistan
China	Lesotho	Rwanda	Vietnam
Cote d'Ivoire	Madagascar	Saudi Arabia	Yemen, Rep
Egypt, Arab Rep	Malawi	Senegal	Zambia
			Zimbabwe

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**Table A1.**  
Countries that compose  
the sample

**Source(s):** The author's own elaboration

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### Supplementary tables

The supplementary material for this article can be found online.

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