



Unravelling Structural Underdevelopment: Is Governance Quality the Key?

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Abstract

Structural underdevelopment remains a critical economic challenge globally. Despite significant advancements, many countries and regions continue to face developmental hurdles due to historical and systemic factors. Among the myriad of factors, the quality of governance has garnered extensive focus for its role in economic outcomes. This study aimed to investigate the relationship between governance quality and economic performance of the countries, guided by institutional theory. Employing data from 197 countries over 1996 to 2022, sourced from the World Bank and the World Governance Indicators, we applied fixed effects and random effects. In addition, the Hausman test was applied in order to initiate the choice between fixed and random effect models. Furthermore, the data was also analysed through descriptive statistics and quantile regression for detailed revelations. Initial findings indicated considerable disparities in governance quality and GDP per capita among income groups. The beta coefficients from our regression analysis elucidated the significance of governance on economic outcomes. Specifically, Voice and Accountability implied a non-positive relation with GDP per capita, whereas Regulatory Quality and Rule of Law exhibited significant positive impact. Stronger positive relationships were evident in the random effects model, reinforcing the connection between governance improvements and economic growth. This research aimed to inform public policy in Pakistan and similar contexts, highlighting how governance quality can affect macro-economic outcomes.

Keywords: Underdevelopment, Governance Quality, Economic Disparities, Institutional Theory, Cross-National Inequality

1. Introduction

Structural underdevelopment remains a challenging puzzle in the contemporary economic landscape. Even as developed nations have made significant economic strides over the past seven decades, vast regions worldwide continue to grapple with deeply entrenched socio-economic disparities. These disparities are not merely consequences of isolated events but are often products of long-standing systemic factors and dynamics.

Building on the idea of structural underdevelopment, it is imperative to consider its implications on a larger scale, especially in terms of economic growth and inequality among countries. Figure 1 shows that the disparities in average per capita income across global income groups are significant, ranging from a mere \$703.58 in low-income countries (LICs) to a staggering \$33,991.44 in high-income countries (HICs). This stark contrast directly reflects the vast economic inequalities prevalent in the world. On the other hand, when examining annual GDP growth rates, the differences among the groups are more subdued. LICs, LMICs, and UMICs have growth rates between 3.82% and 4.07%, with only HICs lagging noticeably at 2.62% (Figure 2).

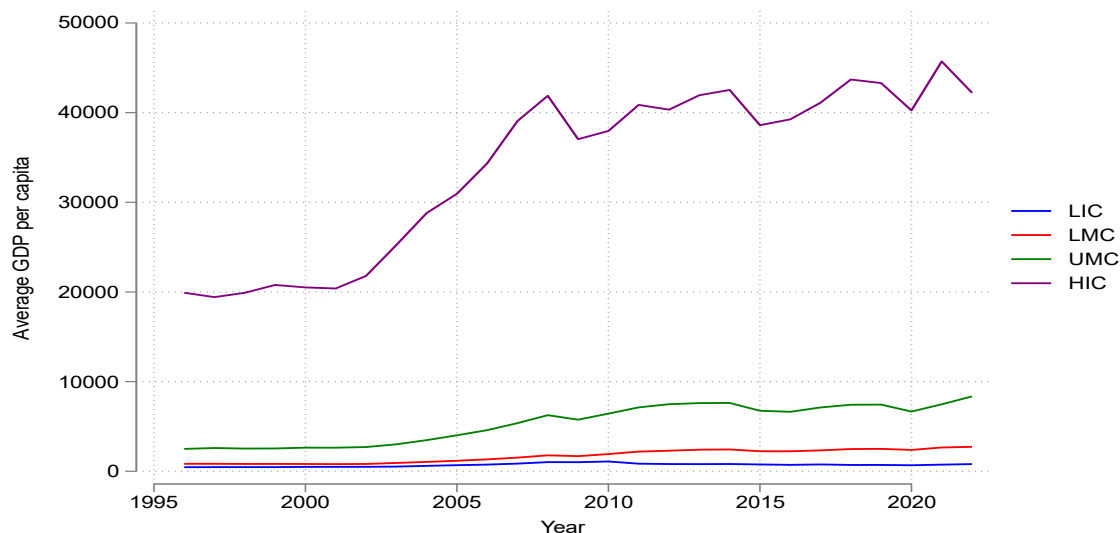


Figure 1: Average GDP per capita income (Current \$US) disaggregated by income levels

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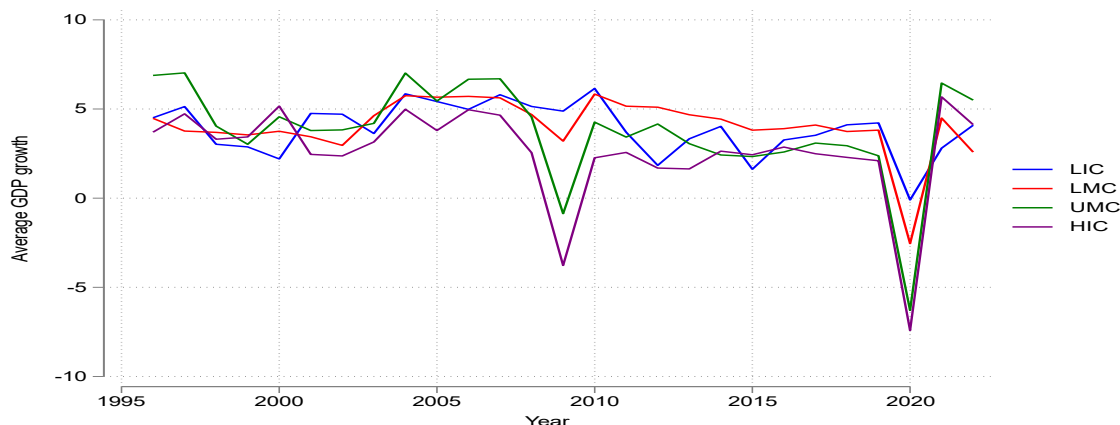


Figure 2: Average GDP growth disaggregated by income levels

While GDP growth provides insights into the rate at which economies expand or contract annually, it doesn't necessarily capture the absolute economic well-being or the disparities between countries. Two countries can have similar growth rates but vastly different standards of living. The average per capita income, however, offers a clearer snapshot of the economic standing of citizens within different countries or regions, making it a more telling variable for understanding the global economy's actual state. The sharp differences in per capita income levels paint a more vivid picture of global economic disparities than the relatively muted variations in GDP growth rates. In China, a clear manifestation of structural underdevelopment can be observed in its industrial production technology. Despite its rapid growth, the nation still faces challenges rooted in its historical economic paradigms, such as capital deviation and a proclivity towards certain production (Yang et al., 2015).

There are a lot of examples of this in different aspects. A major example appears in the technology domain, where the usage of the QWERTY keyboard is still prevalent regardless of numerous better alternatives. This shows how historical factors might affect the innovation despite the fact there are better alternatives available, which leads towards underdevelopment (Simeonov, 2020).

2. Governance Quality and Underdevelopment

Governance indicators play a significant role in determining patterns of economic development. Various dimensions of governance have gained substantial scholarly attention, particularly Voice and Accountability (VAA), Political Stability and Absence of Violence/Terrorism (PSAV), and Government Effectiveness (GEFF). Governance has empirically confirmed the significant impact of private investment decisions in the Middle East and North African region (MENA).

There, the quality of governance, particularly in the form of administrative quality, which encompasses aspects like control of corruption, bureaucratic quality, investment-friendly administration, and law and order, significantly affects entrepreneurial investments. Notably, the role of political stability stands out as a determinant for private investments in this region (Aysan et al., 2007).

There are various economic variables, particularly financial development, trade openness, and human development that have a major impact on private investment decisions; however, these effects are mitigated by governance indicators.

A study on the economy of the Arabian Gulf countries from 1996 to 2015 found that when the quality of governance indicators such as VAA, PSAV, and GEFF were improved, the public debt decreased significantly. The governance positively influences in both direct and indirect ways such as, increase in the growth of GDP (Ali et al., 2019; Tarek & Ahmed, 2017).

The existing literature also highlights the relationship between governance quality and foreign remittance and also there are a lot of other factors that can affect governance. The association between these factors and governance quality varies in different regions and countries. It is also important to note the significance of altering the quality of governance improvements applied to the specific circumstances of the countries of regions, it should not be the one approach fits all (Effiong & Asuquo, 2017).

Moreover, the foreign remittances also play an important role in promoting the economic growth, especially in developing countries. While governance quality is important to utilize the foreign aid. When there is poor quality of governance, the foreign aid is used as domestic expenses rather than utilizing it on the productive means that promote economic activity. The relationship between foreign aid and economic growth is influenced by a lot of factors such as, decreased level of corruption, protection of private property rights, freedom of speech, free media and stability in political environment (Kaya & Kaya, 2020).

It is also observed that the quality of governance also has influence on the performance of the microfinance organizations. It must be noted that microfinance organizations are one of the most widely used techniques of

eliminating poverty in developing countries. According to a study on microfinance institutions in 80 developing countries, the quality of a country's external administration, variables such as political stability, governance effectiveness, and the rule of law, significantly boost the economic performance of these microfinance institutions. Stock markets are widely regarded as a leading indicator of economic activity. Further, it has been demonstrated that the growth of stock markets in Sub-Saharan Africa depends extensively on the quality of governance. Poor governance is frequently associated with corruption and is a major hurdle for business growth. A study on the relationship between governance quality and fraud discovery discovered that countries with poor governance standards, specifically related to the control of corruption, rule of law, regulatory quality, and recovery rates from fraud-related losses, have a suppressed business environment (Yang et al., 2015)

The theoretical framework for understanding the variation in national development levels through the lens of governance quality is deeply rooted in institutional theory. The discussion begins with the exploration of global governance and its enactment through technologies of governance. There are adverse effects of global governance's current setup, leading to a substantial global inequality impacting health, education, and overall well-being (Ahen & Frederick, 2015). Similarly, the debate extends to decentralized natural resource governance, with (Andersson et al., 2008) emphasizing the importance of multi-level dynamics that go beyond local spheres, suggesting that national and international governance structures significantly impact resource management.

According to a study, there is substantial cross-national diversity in governance quality as evaluated by multidimensional factors such as economic, financial, political, and administrative factors. The differences in governance arrangements between countries have an impact on national growth paths. There is wide range of discourses on aid institutions and governance to develop an institutional theory that explains the critical role of governance systems in economic development and emphasizes on the importance of donation funding in achieving institutional change for long-term economic growth (Booth & David, 2011). A study on the governance of voluntary work in the public sector reveals how traditional models of governance neglect the significance of voluntary labor, which might be essential for national growth. It has been stated that budgetary restrictions and quasi-market processes need the enhancement of governance quality. Comparably there has been a debate about the informal and mini-lateral International Monetary Corporation and the way governance structures must be diversified in response to legacy organization defaults, as well as the need to move towards informal multilateralism in response to broader governance issues (Affolderbach et al., 2019; Mueller et al., 2013).

2.1. Statement of the Problem

Structural underdevelopment has remained as an ongoing issue in developing nations, and even though many countries in the global South have made significant progress regarding economic growth and development, wide disparities exist across the global South, focusing on the multifaceted and deep-rooted divide with the global North. In the global South, there are widespread and significant economic disparities. While some nations, such as Singapore, have made economic growth a priority, many obstacles associated with innovation, which may be linked to an over-reliance on foreign MNCs, indicate deeper structural problems (Chia, 2015). Furthermore, the role of governance and efficiency of foreign aid, in explaining investment decisions, needs an extensive investigation. This study seeks to gain vital insight into economic disparities by analyzing historical influences and governance quality on structural underdevelopment.

2.2. Research Objectives

In the present study, we aimed to achieve the following objectives:

- I. Investigate the relationship between governance indicators and GDP per capita, considering key economic covariates, using a panel regression model.
- II. Examine the effect of governance quality on cross-national economic inequality through panel data quintile regression, given the skewed GDP per capita distribution.

3. Materials and Methods

3.1. Research Design

In this section the methodological insights have been given to evaluate the impact of the quality of governance on the economic growth, the study utilized the panel data from World Bank. The data on the quality of governance has been taken from World Governance Indicator (WGI). The WGI project has shown contribution in the different regions and countries by focusing on six governance indicators such as voice and accountability. Voice and accountability represent the people's freedom of speech, their involvement in choosing their government and the independent media. The political stability and the absence of violence/terrorism is second distinguishing feature of WGI project which symbolizes the danger of a government being destabilized or collapsed by unconstitutional or illegal acts, such as politically motivated acts of terrorism or violence. Thirdly, government efficacy measures the quality and independence of the public service due to political constraints, policy development and implementation, and the government's policy credibility. Fourth, regulatory quality evaluates the ability of the government to formulate and execute policies, as well as rules aimed at encouraging private sector development. In addition, Rule of Law assesses the extent to which agents adhere to societal rules, encompassing contract enforcement, property rights, police, law court, and the probability of violence. Finally, Control of Corruption

gauges the degree of public power implemented for private advantage, encompassing equally minor and major corruption methods and state capture by elites and individual interests.

These indexes were constructed from several hundred individual variables from diverse sources of data, reflecting governance views from survey respondents and experts in the public, private, and NGO sectors worldwide. The WGI uses an Unobserved Components Model to standardize these sources into comparable units, create an aggregate governance indicator as a weighted average of underlying variables, and establish margins of error, indicating the inherent challenges in measuring governance (Kaufmann et al., 2011).

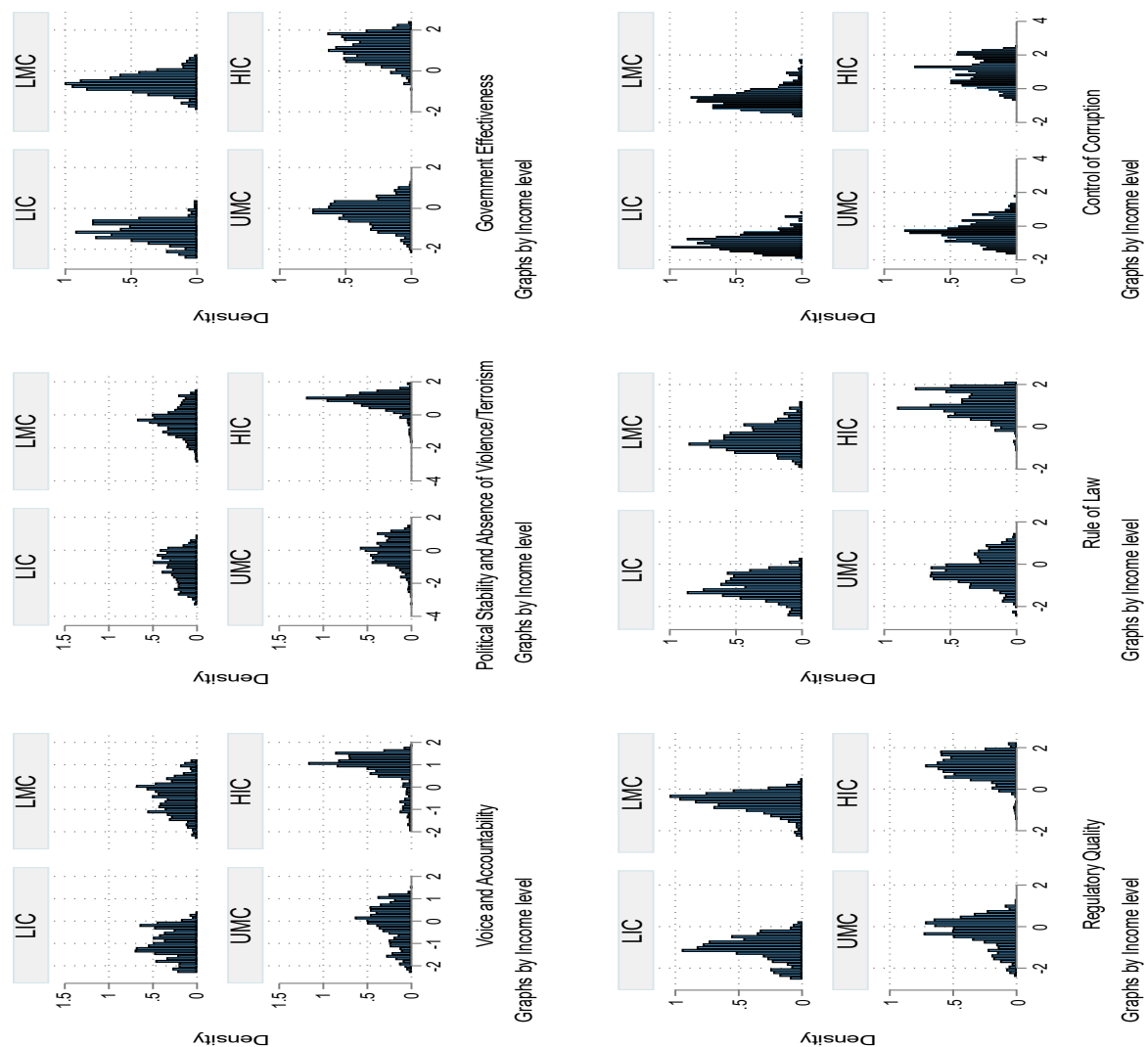


Figure 3: Distribution of governance indicators by national income

Figure 3 illustrates the placement of six governance quality indicators across four country groups depending on their national income: low-income countries (LIC), lower-middle-income countries (LMIC), upper-middle-income countries (UMIC), and high-income countries (HIC). Governance measures such as government effectiveness, rule of law, and regulatory quality have an uneven distribution in high-income countries, indicating that these countries have more strong and effective governance structures. On the other side, there was a left-skewed distribution in low-income countries, which showed that governance indicators in low-income countries are weak. Political stability and the absence of violence and terrorism had an extensive variation across all income groups, which indicates that political stability is not closely linked with income level. There was a lot of instability even in high-income countries and relative stability in low-income countries. Voice and Accountability also showed a broad distribution across all income groups, but with a slight skew towards the lower end in lower income countries, suggesting challenges in ensuring inclusive and participative governance in these regions. Control of Corruption appeared to have a more uniform distribution across income groups, but with a discernible shift towards higher values in high income countries, implying that wealthier nations are more successful in curbing corruption.

4. Data Collection

The data for this analysis was used from the World Governance Indicators and World Bank database. The primary variables included governance indicators (from WGI) and GDP per capita. We utilized the data from 1996 to 2022 for 197 countries of the world.

4.1. Model Specification

To achieve the first objective, the study employed a panel regression model. The model is specified as follows for each governance indicator:

$$\text{GDP per capita}_{it} = \beta_0 + \beta_1 \text{Governance Indicator}_{it}^j + \gamma_c \mathbf{X}_{it} + u_{it} \quad \text{Eq. (1)}$$

Where β_0 is the intercept, β_1 is the coefficient of governance indicator j where j ranges from 1 to 6 and corresponds with Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption, respectively. The vector \mathbf{X} is a set of covariates such as Foreign Direct Investment, Tax Revenue, Inflation, and Trade as a Percentage of GDP, Female Academic Staff in Tertiary Education, Population Growth, and Life Expectancy to control for other factors potentially affecting economic development.

For the second objective, the study employed panel data quintile regression to examine the impact of governance quality on cross-national economic inequality. As Figure 4 shows, the distribution of GDP per capita is notably skewed. Most of the data clusters towards the left, signifying that a substantial number of countries globally fall within the lower income bracket. Conversely, the extended right tail is indicative of a few countries with remarkably high per capita income, even exceeding 200,000 US\$. Such a distribution pattern is clearly non-normal. In such circumstances, Quantile Regression offers a more robust and unbiased estimate that takes into account the unique distribution characteristics of the dependent variable (Zheng et al., 2019).

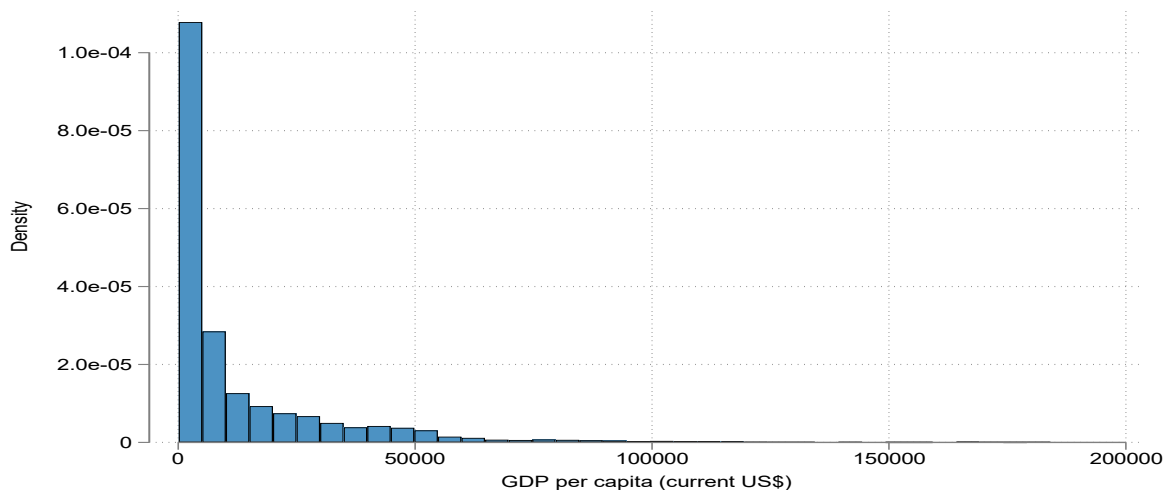


Figure 4: Histogram of GDP per capita (current US\$), Source: World Bank

The quintile regression has been specified as follows for each governance indicator:

$$Q(\text{GDP per capita}_{it}) = \beta_0 + \beta_1 \text{Governance Indicator}_{it}^j + \gamma_c \mathbf{X}_{it} + u_{it} \quad \text{Eq. (2)}$$

Where $Q(\cdot)$ indicates quantiles of the GDP per capita.

4.2. Econometric Analysis

The optimal choice among using fixed effects or random effects models for estimating Eq. (1) was determined using the Hausman test.

Eq. (2) was estimated using quantile regression. The quantile regression provides insights across different quantiles of the income distribution, thus shedding light on the impact of governance quality on economic inequality across nations

5. Results and Discussion

This chapter elucidates the empirical results of this study.

5.1. Descriptive statistics

The summary statistics in Table 1 offer a quantitative insight into the relationship between governance quality and economic performance. GDP per capita, with a mean of 14,480 USD and a high SD of 23,009 USD, further indicates economic disparities, possibly influenced by governance standards. Similarly, the ease of doing business index has an average score of 56.87 and a SD of 14.58, suggesting varied business environments influenced by regulatory frameworks. In terms of governance measures, Voice and Accountability, and Political Stability and Absence of Violence/Terrorism, showed near-zero means (-0.00344 and -0.00467, respectively) but with high

SDs (0.993 and 0.989), implying a wide range of governance quality across different countries. This variance was critical in assessing the impact of governance on economic outcomes, as countries with lower scores in these areas might experience different economic growth trajectories compared to those with higher scores.

The average annual GDP growth rate was 3.432%, with a substantial standard deviation (SD) of 6.171%, indicating wide disparities in economic growth across nations. This variation aligns with the importance of governance in economic stability, as countries with better governance might exhibit more stable and higher growth rates. Foreign direct investment (FDI) presents an average net inflow of approximately 8.513 billion USD, but with a massive SD of 35.39 billion USD, highlighting the significant differences in how countries attract FDI. This variability in FDI could be influenced by factors such as regulatory quality and rule of law, which are crucial for investor confidence.

Table 1: Summary statistics

Variables	N	MEAN	SD	MIN	MAX
Annual GDP growth (%)	5,443	3.432	6.171	-54.24	150.0
Gross capital formation (% of GDP)	4,548	23.84	8.538	-3.946	79.40
Foreign direct investment, net inflows (current US\$)	5,246	8.513e+09	3.539e+10	-3.303e+11	7.338e+11
Tax revenue (% of GDP)	4,874	16.13	7.536	7.87e-05	147.7
Manufacturing, value added (annual % growth)	4,505	3.338	13.49	-80.07	502.1
Ease of doing business index (1=most business-friendly regulations)	4,863	56.87	14.58	19.98	87.17
Domestic credit to private sector (% of GDP)	4,865	78.18	69.62	5.029	390.8
Inflation, consumer prices (annual %)	4,734	8.395	65.92	-16.86	4,145
Trade (% of GDP)	4,793	89.53	58.02	0.0269	863.2
Tertiary education, academic staff (% female)	4,839	11.43	9.125	0	59.26
GDP per capita (current US\$)	5,527	14,480	23,009	99.76	234,317
Population growth (annual %)	5,859	1.338	1.593	-14.19	19.36
Urban population (% of total)	5,805	58.17	24.33	7.412	100
Claims on private sector (annual growth as % of broad money)	4,109	49.21	44.13	0.00161	326.2
Fertility rate, total (births per woman)	5,466	2.935	1.553	0.772	7.985
Life expectancy at birth, total (years)	5,458	69.86	9.154	18.39	85.50
Fixed broadband subscriptions (per 100 people)	5,272	8.545	12.47	0	77.12
Gini index (World Bank estimate)	4,852	38.68	8.800	23.20	65.80
Voice and Accountability	5,195	-0.00344	0.993	-2.313	1.801
Political Stability and Absence of Violence/Terrorism	5,180	-0.00467	0.989	-3.313	1.965
Government Effectiveness	5,134	-0.00319	0.977	-2.450	2.426
Regulatory Quality	5,134	-0.00344	0.980	-2.548	2.255
Rule of Law	5,195	-0.0113	0.986	-2.591	2.125
Control of Corruption	5,140	-0.00974	0.991	-1.916	2.459

5.2. Regression analysis

5.3. Fixed effect model and random effect model

In conducting a comprehensive analysis of the study on governance quality measures and their impact on GDP per capita, we delve into the findings from both fixed effects and random effects models, carefully examining the intricate relationship between governance and economic performance.

Starting with the fixed effects model, Voice and Accountability, with a beta of -201.23 ($p > 0.1$), surprisingly indicates a negative yet statistically insignificant effect on GDP per capita (Table 2). This contradicts the expected positive influence, suggesting that in this model, higher levels of voice and accountability might not necessarily boost economic performance. Political Stability and Absence of Violence/Terrorism presents a beta of 177.70 ($p > 0.1$). Despite the positive sign, aligning with our expectations that stability fosters economic growth, the lack of statistical significance implies this relationship is not strong within the fixed effects framework.

Table 2: Fixed and Random Effect Model

GDP per capita (current US\$)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Fixed effects						Random effects					
Voice and Accountability	-	201.23					514.6	7*				
		3					(2.26)					
		(-0.87)										
Political Stability and Absence of Viol./Terrorism		177.7						701.1				
		0						2***				
		(0.97)						(3.80)				
Government			170.0							1485.6		

Effectiveness			5						3***				
			(0.59)						(5.32)				
Regulatory Quality				1384.5						2437.6			
				7***						1***			
				(4.95)						(9.06)			
Rule of Law					1079.3						2222.5		
					5***						8***		
					(3.85)						(8.17)		
Control of Corruption						622.8						1915.1	
						9*						1***	
						(2.35)						(7.47)	
Annual GDP growth (%)	69.58	69.42	69.27	69.78**	69.46**	69.06	78.75	79.42	77.87**	77.49**	78.19**	77.59**	
	***	***	***	*	*	***	***	***	*	*	*	*	
	(4.01)	(4.00)	(3.99)	(4.04)	(4.02)	(3.99)	(4.38)	(4.44)	(4.35)	(4.38)	(4.38)	(4.33)	
Gross capital formation (% of GDP)	39.68	38.21	39.02	36.80*	38.79*	36.58	18.31	16.50	19.14	19.26	20.12	12.19	
	*	*	*	*	*	*	*	*	*	*	*	*	
	(2.57)	(2.47)	(2.53)	(2.39)	(2.52)	(2.37)	(1.16)	(1.05)	(1.22)	(1.24)	(1.28)	(0.77)	
Foreign direct investment, net inflows (current US\$)	0.00**	0.00**	0.00**	0.00***	0.00***	0.00**	0.00**	0.00**	0.00***	0.00***	0.00***	0.00***	
	*	*	*	*	*	*	*	*	*	*	*	*	
	(4.51)	(4.54)	(4.52)	(4.46)	(4.45)	(4.53)	(4.27)	(4.24)	(4.09)	(4.14)	(4.07)	(4.20)	
Inflation, consumer prices (annual %)	5.89+	5.85+	5.85+	5.58+	5.23	5.64+	7.28*	6.88*	6.52+	6.43+	5.75+	6.33+	
	(1.81)	(1.80)	(1.80)	(1.72)	(1.61)	(1.73)	(2.15)	(2.05)	(1.94)	(1.93)	(1.71)	(1.88)	
Tertiary education, academic staff (% female)	91.45	93.43	91.94	89.60**	95.99**	93.63	90.78	93.63	86.77**	85.26**	97.55**	93.90**	
	***	***	***	*	*	***	***	***	*	*	*	*	
	(5.97)	(6.09)	(6.01)	(5.88)	(6.28)	(6.13)	(5.71)	(5.91)	(5.49)	(5.46)	(6.19)	(5.93)	
Population growth (annual %)	919.8	918.5	921.8	912.59	911.90	922.2	990.8	961.6	975.79	963.51	962.64	987.01	
	7***	8***	7***	***	***	2***	8***	9***	***	***	***	***	
	(9.46)	(9.44)	(9.48)	(9.42)	(9.40)	(9.49)	(9.85)	(9.61)	(9.76)	(9.74)	(9.66)	(9.86)	
Urban population (% of total)	-	-	-	-	-	-	21.53	12.94	12.48	8.17	13.72	20.87	
	276.6	272.5	273.8	252.32	268.23	270.2							
	8***	2***	2***	***	***	6***							
	(-7.51)	(-7.38)	(-7.42)	(-6.83)	(-7.30)	(-7.34)	(0.82)	(0.49)	(0.47)	(0.31)	(0.53)	(0.81)	
Claims on private sector (annual growth as % of broad money)	26.28	26.19	26.13	25.32**	25.11**	25.65	33.37	32.82	31.49**	29.93**	29.82**	30.80**	
	***	***	***	*	*	***	***	***	*	*	*	*	
	(5.00)	(4.99)	(4.97)	(4.84)	(4.78)	(4.88)	(6.28)	(6.20)	(5.94)	(5.70)	(5.64)	(5.81)	
Fertility rate, total (births per woman)	-	-	-	-	-	-	-	-	-	-	-88.07	-37.97	
	747.8	733.8	746.7	760.16	749.66	735.7	108.3	94.77	100.83	139.18			
	1*	0*	2*	*	*	4*	4						
	(-2.21)	(-2.17)	(-2.21)	(-2.26)	(-2.22)	(-2.18)	(-0.34)	(-0.30)	(-0.32)	(-0.44)	(-0.28)	(-0.12)	
Life expectancy at birth, total (years)	203.5	203.6	202.0	185.27	192.09	202.3	157.8	162.7	151.02	134.83	136.41	158.75	
	6***	2***	8***	***	***	3***	0**	3***	**	**	**	**	
	(4.13)	(4.13)	(4.10)	(3.77)	(3.90)	(4.11)	(3.24)	(3.35)	(3.11)	(2.80)	(2.82)	(3.29)	
Fixed broadband subscriptions (per 100 people)	508.3	507.5	507.6	505.07	505.00	506.5	487.6	488.3	487.20	486.39	483.58	484.85	
	4***	2***	1***	***	***	0***	8***	4***	***	***	***	***	
	(34.47)	(34.42)	(34.41)	(34.37)	(34.29)	(34.36)	(32.24)	(32.44)	(32.37)	(32.66)	(32.24)	(32.20)	
Gini index (World Bank estimate)	-	-	-	-	-	-	-	-	-	-	-	-	
	50.13	49.80	50.72	50.30**	45.22**	49.62	52.42	45.30	48.06**	49.66**	38.34**	46.33**	
	***	***	***	*	*	***	***	***	*	*	*	*	
	(-3.79)	(-3.76)	(-3.84)	(-3.82)	(-3.41)	(-3.76)	(-3.83)	(-3.32)	(-3.53)	(-3.69)	(-2.81)	(-3.40)	
Constant	9328.09*	9060.96*	9294.75*	9291.80*	9501.31*	9061.73*	-6695.71+	-6770.87+	-5799.46	-4201.50	-5182.81	-6880.20+	
	(2.27)	(2.20)	(2.26)	(2.27)	(2.31)	(2.20)	(-1.68)	(-1.70)	(-1.46)	(-1.06)	(-1.31)	(-1.74)	
Observations	3361	3361	3361	3361	3361	3361	3361	3361	3361	3361	3361	3361	
F_f	84.36	83.72	76.19	80.10	73.87	70.03							
p_f	0.00	0.00	0.00	0.00	0.00	0.00							
F	218.58	218.60	218.52	222.04	220.63	219.27							
P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
chi2							2941.61	2952.32	2982.68	3077.63	3058.04	3044.38	

Government Effectiveness shows a positive direction with a beta of 170.05 ($p > 0.1$), suggesting that effective governance could be beneficial for economic output. However, the insignificance of this result calls for a cautious interpretation. Regulatory Quality stands out with a significant and strong positive impact, evidenced by a beta of 1384.57 ($p < 0.01$). This substantial effect underscores the importance of regulatory frameworks in economic growth, aligning well with the theoretical expectation. Rule of Law, with a beta of 1079.35 ($p < 0.01$), also shows a significant positive impact. This reinforces the theory that a strong legal framework is crucial for economic development. Control of Corruption, with a beta of 622.89 ($p > 0.1$), indicates a positive but marginally significant influence. This suggests that reducing corruption could positively affect GDP per capita, though the impact might be more moderate than expected.

Shifting to the random effects model, Voice and Accountability shows a stark contrast with a beta of 514.67 ($p < 0.1$), indicating a positive and marginally significant impact. This suggests that, when considering random country-specific effects, this governance measure may indeed positively influence economic performance. Political Stability and Absence of Violence/Terrorism, with a beta of 701.12 ($p < 0.001$), shows a much stronger and statistically significant positive effect compared to the fixed effects model, emphasizing the critical role of political stability in economic growth.

The beta coefficient for the effectiveness of Government is 1485.63 ($p < 0.001$), which indicates a considerable positive influence, which ultimately reinforces the conclusion that strong governance is a critical driver of economic growth. In the random effects model, regulatory quality has a beta of 2437.61 ($p < 0.001$) and rule of law has a beta of 2222.58 ($p < 0.001$) having substantial positive benefits. The findings reveal that regulatory quality and the rule of law have influence on economic growth. While the Control of Corruption with a beta of 1915.11 ($p < 0.001$), which shows that there is a substantial positive impact in random effect model. This study reveals that the corruption control measure that are opt have impact on the economic performance of the countries. If we compare the fixed effect model and random effect model, the stronger association between governance indicators and GDP per capita have been found by the random effect model. This might be attributed to the model's capacity to capture unobserved country-specific variables that may impact the connection. The consistency in the direction of the impact across both models suggests a general trend that improved governance correlates positively with higher GDP per capita, although the magnitude and significance of this relationship vary.

Overall, the findings align with the hypothesis that governance measures positively influence GDP per capita, but the extent and statistical significance of these effects differ between the fixed effects and random effects models. This analysis underscores the complexity and multifaceted nature of the relationship between governance quality and economic performance, highlighting the importance of considering different modelling approaches in empirical economic research.

5.4. Hausman test

The Hausman test results, indicating significant differences between fixed effects and random effects models across various governance measures, suggest that the random effects estimates could be inconsistent and biased (Table 3). The high Chi-Square values and p-values of 0.0000 for measures like Voice and Accountability (268.72), Political Stability and Absence of Violence/Terrorism (234.76), Government Effectiveness (239.59), Regulatory Quality (190.73), Rule of Law (229.81), and Control of Corruption (253.00) point towards substantial disparities between the models. Given these findings, it becomes prudent to rely on the fixed effects method for the remainder of the analysis. This approach is particularly justified as it better accounts for unobserved heterogeneity within entities, thereby reducing the likelihood of bias and ensuring more reliable and accurate estimates of the impact of governance measures on GDP per capita. Consequently, the fixed effects method has been adopted in the subsequent analysis to ensure greater consistency and validity in the results.

Table 3: Hausman Test

Model Comparison (Fixed effects vs Random Effects)	Chi-Square (χ^2) Value	P-Value
Voice and Accountability	268.72	0.0000
Political Stability and Absence of Violence/Terrorism	234.76	0.0000
Government Effectiveness	239.59	0.0000
Regulatory Quality	190.73	0.0000
Rule of Law	229.81	0.0000
Control of Corruption	253.00	0.0000

5.5. Quantile regression

Analysing the quantile regression results for the impact of governance quality measures on GDP per capita reveals varying relationships across different income levels, represented across different quantiles (10%, 25%, 50%, 75%, and 90%).

Voice and Accountability show a consistently negative impact on GDP per capita across all quantiles, with coefficients ranging from -377.69 to -700.59. This trend suggests a potential adverse effect of increased voice and accountability on GDP per capita, yet none of these effects are statistically significant, as indicated by t-statistics that do not demonstrate strong evidence against the null hypothesis. Intriguingly, the most negative impact is

observed at the 75th percentile (-700.59), indicating a possible stronger negative association in higher-income countries.

Table 4: Quantile regression

GDP per capita (current US\$)	q1 (10%)	q2 (25%)	q3 (50%)	q4 (75%)	q5 (90%)
Voice and Accountability	-377.69 (-1.21)	-437.45 (-1.30)	-544.93 (-1.42)	-700.59 (-1.55)	-595.56 (-1.30)
Political Stability and Absence of Violence/Terrorism	57.16 (0.23)	88.07 (0.33)	144.63 (0.49)	153.82 (0.48)	207.05 (0.60)
Government Effectiveness	278.94 (0.49)	553.32 (0.95)	548.63 (0.93)	510.47 (0.83)	571.61 (0.86)
Regulatory Quality	1306.57* (2.47)	1467.38** (2.67)	1564.72* (2.40)	1602.25* (2.31)	1555.14* (2.13)
Rule of Law	1274.13** (2.78)	1226.35* (2.50)	1179.56* (2.39)	1272.38* (2.32)	993.28 (1.61)
Control of Corruption	795.94+ (1.87)	727.53+ (1.73)	821.41+ (1.83)	915.37+ (1.96)	718.86 (1.43)

GDP per capita showed a positive relation with political stability and absence of Terrorism across all quantiles, with coefficients increasing from 57.16 at the 10th percentile to 207.05 at the 90th percentile. Despite this positive trend, the statistical insignificance, as shown by the t-statistics (ranging from 0.23 to 0.60), suggests that these results should be interpreted with caution.

Government Effectiveness presents a positive impact across all quantiles, with coefficients ranging from 278.94 to 571.61. However, similar to the previous measures, the t-statistics imply that these effects are not statistically significant, thereby limiting the conclusiveness of government effectiveness on economic performance.

Regulatory Quality demonstrates a significant positive effect on GDP per capita across all quantiles, with coefficients from 1306.57 at the 10th percentile to 1555.14 at the 90th percentile. The t-statistics for these coefficients are above the critical values for statistical significance, particularly at the 10% and 25% quantiles, indicating a robust positive relationship between regulatory quality and economic performance, especially in lower-income countries.

Rule of Law also shows a positive impact on GDP per capita, with the highest significance observed at lower quantiles (1274.13 at 10%, 1226.35 at 25%) and decreasing towards the higher quantiles. While the impact remains positive across the board, it is statistically significant only up to the 75th percentile, suggesting that the influence of the rule of law may be more pronounced in countries with lower to medium levels of GDP per capita. Control of Corruption reveals positive coefficients across all quantiles, with marginal significance ($p < 0.10$) in all but the 90th percentile. The fluctuating magnitude of the coefficients, from 795.94 at the 10th percentile to 915.37 at the 75th percentile, indicates an inconsistent impact of corruption control across different income levels. Overall, the results indicate that the impact of governance quality on GDP per capita is not uniform across countries with varying levels of economic performance. Regulatory Quality and Rule of Law exhibit significant positive impacts, particularly at lower income levels, highlighting their importance in economic development. The consistent yet statistically insignificant negative trend for Voice and Accountability across all quantiles is notable and warrants further investigation. The lack of statistical significance in most measures across various quantiles suggests the need for careful interpretation and points to the possibility of other factors influencing the association amongst economic performance and governance.

The model assessing the impact of governance quality measures on GDP per capita was adjusted for several key variables: Gross capital formation (% of GDP), Foreign direct investment, net inflows (current US\$), Fixed broadband subscriptions (per 100 people), Annual GDP growth (%), Inflation, consumer prices (annual %), and Population growth (annual %). These adjustments were made to account for various economic factors that could influence the relationship between governance measures and GDP per capita.

To estimate the models, we employed the `xtmdqr` command in Stata, as suggested by (Pons & Melly, 2022). This command calculates the quantile analogs of random effects, fixed effects, and between estimators for panel data. Specifically, we used the fixed effects option (`fe`), which requests the fixed-effects estimator. This estimator is particularly useful as it exploits variation within individuals to estimate the effect of independent variables, ensuring that the estimates are not confounded by endogeneity.

5.6. Analysis by income groups

The disaggregated data by country income levels provides a nuanced view of how governance quality measures affect GDP per capita differently in high income (HIC), low income (LIC), lower middle income (LMIC), and upper middle income (UMIC) countries (Table 5).

Voice and Accountability has varied effects across income levels. In LIC, it shows a slightly negative impact with a coefficient of -52.76, which is marginally significant ($p < 0.10$). LMIC countries experience a similar negative effect (-55.75), but it's not statistically significant. In UMIC countries, the effect turns positive (256.11), yet

remains statistically insignificant. HIC countries see a more substantial negative impact (-224.23), although this is also not statistically significant.

Table 5: Analysis disaggregated by income level of the countries

GDP per capita (current US\$)	LIC	LMIC	UMIC	HIC
Voice and Accountability	-52.76 ⁺ (-1.75)	-55.75 (-1.47)	256.11 (1.56)	-224.23 (-0.33)
Political Stability and Absence of Violence/Terrorism	-5.95 (-0.31)	-28.87 (-0.92)	92.71 (0.72)	1670.17** (2.58)
Government Effectiveness	-119.72** (-2.98)	-122.96* (-2.42)	-79.40 (-0.45)	1391.92 (1.61)
Regulatory Quality	-64.27 (-1.57)	-159.88*** (-3.35)	106.48 (0.59)	4461.37*** (5.71)
Rule of Law	42.16 (1.10)	-134.88** (-2.86)	165.37 (0.88)	3579.36*** (4.40)
Control of Corruption	-36.89 (-0.93)	-88.68 ⁺ (-1.80)	-312.70 ⁺ (-1.85)	1318.00 ⁺ (1.90)

Note: HIC represents High Income countries, LIC stands for Low Income countries, LMIC is used for Lower Middle-Income countries, and UMIC signifies Upper Middle-Income countries.

Political Stability and Absence of Violence/Terrorism presents a negligible negative impact in LIC (-5.95) and a more pronounced negative effect in LMIC (-28.87), both of which are statistically insignificant. The relationship turns positive in UMIC (92.71) but remains insignificant. However, in HIC, there's a significant and substantial positive effect (1670.17, $p < 0.01$), indicating that political stability may play a more crucial role in the economic performance of high-income countries.

Government Effectiveness shows a significant negative relationship with GDP per capita in LIC (-119.72, $p < 0.01$) and LMIC (-122.96, $p < 0.05$). The negative effect is less pronounced and insignificant in UMIC (-79.40). In HIC, the relationship becomes positive (1391.92) but remains statistically insignificant. Regulatory Quality has a varying impact. In LIC, the effect is slightly negative (-64.27) and not significant. The negative effect is more substantial and significant in LMIC (-159.88, $p < 0.001$). In contrast, UMIC countries exhibit a positive but insignificant impact (106.48). HIC countries show a highly significant and positive effect (4461.37, $p < 0.001$), suggesting that regulatory quality is particularly beneficial for the economic performance of high-income countries.

Rule of Law demonstrates a positive but insignificant impact in LIC (42.16). In LMIC, the effect is significantly negative (-134.88, $p < 0.01$). The relationship turns positive in UMIC (165.37) but remains insignificant. In HIC, Rule of Law has a significant and substantial positive impact (3579.36, $p < 0.001$), indicating its critical importance in high-income countries.

Control of Corruption presents a negative impact across all income levels except HIC. In LIC, LMIC, and UMIC, the effects are -36.89, -88.68, and -312.70, respectively, with the latter two showing marginal significance ($p < 0.10$). In HIC, the effect is positive and marginally significant (1318.00, $p < 0.10$), suggesting that controlling corruption may have a more noticeable positive impact on the GDP per capita in high-income economies.

Overall, these findings indicate that the impact of governance measures on economic performance varies significantly across countries with different income levels. The effects are more pronounced and often more positive in high-income countries, especially for Political Stability, Regulatory Quality, Rule of Law, and Control of Corruption. In contrast, negative impacts from these governance measures is often experienced by lower- and middle-income countries, highlighting the complex dynamics between governance quality and economic development across different economic contexts.

In the analysis described above, the model was carefully adjusted to include a range of covariates that could potentially influence the relationship between governance quality measures and GDP per capita. These covariates encompassed various aspects of economic and social development: Annual GDP growth (%), Gross capital formation (% of GDP), Foreign direct investment, net inflows (current US\$), Inflation, consumer prices (annual %), Tertiary education with a focus on academic staff gender composition (% female), Population growth (annual %), Urban population (% of total), Claims on the private sector (annual growth as % of broad money), Fertility rate (births per woman), Life expectancy at birth (total years), Fixed broadband subscriptions (per 100 people), and the Gini index as estimated by the World Bank.

To ensure a robust and reliable analysis, a fixed effect model was utilized. This model choice is particularly pertinent as it allows for controlling individual-specific characteristics that could confound the observed relationships. By including these diverse covariates and employing a fixed effect model, the study aims to provide a comprehensive and nuanced understanding of how governance quality impacts economic performance across different income levels and country groups.

6. Discussion

Our examination reveals crucial insights on the influence of governance quality measures on GDP per capita by using fixed effects and random effects models. Whereas the fixed random effects models reveal a stronger relationship between Taverns quality indicators and GDP per capita, and the Hausman test shows potential biases in the random effects model and supports the fixed effects model. The main finding of our analysis is that regulatory quality and the rule of law have a significant positive influence on GDP per capita, although all six governance indicators have an expected positive and significant impact on GDP per capita. Meanwhile, the quintile regression demonstrates that the association between governance parameters and economic growth varies by country's income level. We discovered that regulatory quality and the rule of law are more beneficial in improving GDP per capita at lower income levels. There is also additional evidence that governance measures have a considerably greater influence on GDP per capita growth in countries with high incomes. However, changing the model with a set of covariates and selecting a technique of estimate underscores the subtle and varied nature of the association between governance quality and GDP per capita.

It is important to highlight that when we interpret the substantial beneficial relationship of regulatory quality, rule of law, and GDP per capita the earlier research provides plenty of additional support for our results. According to (Emara & Said, 2021) the institutional quality, regulatory quality, and the rule of law all had a favorable effect on GDP growth. However, the outcome is consistent with previous studies that emphasize the importance of regulatory quality in boosting economic considerations. Yet another study (Abdullah et al., 2020), states that, the growth in per capita GDP increases by the rule of law. The institutions and foreign direct investment are positively and substantially related, which highlights the governance measures' larger economic significance.

To understand the expected significant and positive relationship between governance quality and economic indicators using the random effects model, suggested that recording both within-country and between-country differences is critical. (Listokin, 2008) emphasizes the importance of this strategy in portraying the dynamic nature of governance and its various repercussions. The random effects model is also suitable for capturing unobserved variability and individual differences. The random effects model is also appropriate for accounting for unobserved heterogeneity and individual differences. Another study (Silva & Wanniarachchige, 2022) discovered significant relationship by utilizing random effect model. The differential effect of governance measures across income levels has also been highlighted in the previous literature and highlights the contingent nature of this association. (Behnezhad et al., 2021) contribute to the literature by emphasizing the relevance of social infrastructure and institutional efficiency in developed nations. The association between economic development, income disparity, and governance quality, as noted by (Altaf, 2019) further reveals the multifaceted nature of this relationship.

When we evaluate the insignificant influence of governance measures such as voice and accountability, as well as political stability, in the panel fixed effects model, some research suggests that there are deep dynamics and potential complexities in the relationship with economic indicators. As a result, policy background and thresholds must be considered. It is equally critical to evaluate the developmental aspects as well as the variability in the influence of governance quality. There is a need for a perspective approach to highlight the effect of governance quality on economic variables. (Mankiw et al., 1992) proposed a convergence principle by focusing on the varying effect of governance indicators on the economic variables between the high and low income countries. According to this principle, institutional capacities explains the greater impact of governance quality on economic performance of the countries with high income countries. (Ajide et al., 2020) highlights the importance of the governance quality to boost the financial stability. The study states that is an essential factor for the growth in high income countries. Moreover, taking the guidelines from WHO'S prospective on cost effective criteria, (Woods et al., 2016) finds out the strong relationship between governance quality and economic development, especially in high income countries. The positive association between better governance and GDP per capita demonstrated by (Khusniati & Wardani, 2022) further, emphasizes the significance of governance measures in high-income nations.

7. Conclusion

Our study the subtle influence of governance quality on GDP per capita, particularly when we disaggregate the countries in our sample by per capita income. The fixed effects model demonstrates the significant association between GDP per and all governance indicators, particularly when we include the counterintuitive negative effect for voice and accountability. This finding further shows the strong and anticipated positive association between governance measures and GDP per capita when we reinforce the random effect model potentially due to the random effects model's ability to reflect observed country-specific variation. However, the Hausman test suggests caution, indicating that there might be inconsistencies in the random effects' estimations, whereas the findings from the fixed effects model are more accurate.

The distinction necessitates some specific governance modifications adapted to each country's specific institutional and economic institutional quality. Our estimation methods show the complex relationship between governance measures and economic outcomes, by considering a wide range of economic and social factors, this integrated approach has increased our understanding of the complicated rule of governance that boosts economic results and provides the groundwork for future policy-focused research to investigate this association extensively.

Disaggregated analysis by income groups uncovers that the benefits of governance improvements are more pronounced in high-income countries, particularly for Political Stability, Regulatory Quality, and Rule of Law, while low income countries and lower-middle income countries may experience varying or even adverse effects.

7.1. Policy implications

The existence of strong positive effect of regulatory quality and the rule of law on GDP per capita has significant policy implications for both emerging and developed countries. It is recognized that there is need for strong regulatory frameworks in achieving appropriate economic outcomes, as well as there is need for policies that streamline regulations and strengthen the legal environment while considering each country's particular circumstances.

The association between institutional quality and FDI demonstrates that there is a need for reliable, efficient governance and market-friendly legislation to stimulate the investment, which is crucial for developing nations. And to encourage economic growth and attract foreign capital, developing countries may establish clear, transparent, and effective regulatory frameworks.

Further, the studies may investigate governance measures that have not yet been examined, as well as economic outcomes other than GDP per capita or GDP growth. Upcoming research may explore how particular components of governance, such as digital governance or public service efficiency, shape economic outcomes. Longitudinal studies employing micro datasets or cross-country comparisons might be useful in generating new perspectives.

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