Chapter 4

Impact of Governance Quality, Liberal Democracy, and Their Interaction on Income Inequality in Extremely Weak Governance and Extremely Robust Governance Countries

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4.1 Introduction

Reducing income inequality by providing basic social needs to needy people is a strategy to foster economic development (Dabla-Norris *et al.,* 2015; Asamoah, 2021). However, some countries in the world have experienced an increase in income and wealth inequalities in recent decades, leading to unequal access to basic services for the marginalized sections of society (Ferreira *et al.*, 2022). Widening income inequality is a manifestation of disadvantages suffered by particular segments of society (Dabla-Norris *et al.,* 2015). This tremendous rise in income inequality brought on by economic progress and prosperity worsens the situation for the poor while improving it for the rich, making the world a more unsettling place (Sala-i-Martin, 2002). It results in the concentration of political power in the hands of a few elite groups, causing inefficient use of human resources and political and economic instability that discourages investment (Dabla-Norris *et al.*, 2015). Hence, a considerable body of literature has discussed good governance as a remedy for income inequality in an economy (Acemoglu *et al.,* 2001; Roy-Mukherjee & Udeogu, 2020). A desirable good governance or institution is essential to protect property rights, uphold contracts, attract investment, promote economic integration across the world, maintain macroeconomic stability, reduce poverty, provide valuable services, promote social welfare through proper resource allocation creating peaceful socio-economic environment, and enhance political stability (Rodrik, 2008). However, defining the term ‘governance’ is not an easy task. Governance does not necessarily mean government; it may be implemented by governments, institutions, and business organizations when there is an equitable and fair legal system that promotes sustainable development by upholding the rule of law and governance (Danish *et al.,* 2019). In the contemporary world, governance is many forms of statecraft, such as monarchy, kingship, autocracy, dictatorship, oligarchy, and democracy (Hassan *et al.,* 2021). UNDP (1997) defines governance as the execution of economic, political, and administrative authorities to govern a country's affairs in all dimensions. The World Bank

(1992) defined governance as ‘the manner in which power is exercised in the management of a country's economic and social resources for development.’ The quality of governance depends on the mechanisms of selection, evaluation, and replacement of governments, as well as their capacity to create and carry out effective public policies and to gain the trust of citizens and the state in their governing bodies (Kaufmann *et al.,* 2000). If the governance is efficient in public service, a trustworthy legal system, and the administrative system is accountable to its citizens, it is known as good governance (World Bank, 1989). Otherwise, governance is weak if the government fails to carry out its responsibilities, leading to failure in economic, political, and civic institutions (OECD, 2006).

Democracy means ‘rule by and for the people’ (V-Dem, 2024). It is typically presented as heralding a host of many social advantages, and that level of democracy differs from region to region (Ahmad, 2017). A low level of democracy is known as closed autocracy and a high level is called liberal democracy. Closed autocracy refers to no multiparty executive elections and lack of basic elements of democracy, including free and fair elections and freedom of expression and association. Liberal democracy provides information on free and fair elections, freedom of expression and association, voting rights, equality before the law, safeguarding of civil liberties, and executive constraints (V-Dem, 2024). A good democracy is one where people enjoy equal civil liberty and political rights, popular control over decision-making, and a stable political system (Diamond & Morlino, 2005). V-Dem distinguishes five high-level ideals of democracy: participatory, deliberative, egalitarian, electoral, and liberal. The participatory democracy emphasizes the active engagement of citizens in all political, electoral, and non-electoral activities; a deliberative process of democracy is one where decisions are guided by collective reasoning aimed at serving the common interest, which is contrasted with solidary attachments, emotional appeals, parochial interests, or coercion; the egalitarian democratic principle measures the level of equal capabilities that all social groups enjoy to engage in all political arenas, such as information on voting decisions, expressing views, right to demonstrate, running for office, or other means of influencing policy-making; electoral democracy is represented by the multiparty elections for the executive position, which are held in a free and fair environment and encompasses satisfactory level of voting rights, freedom of expression and association; and liberal democracy is meeting the requirements of electoral democracy along with judicial and legislative checks on the executive power as well as safeguarding the civil liberties and equality of all before the law (V-Dem, 2024).

In today's modern world, governance is far better in developed countries as compared to developing and underdeveloped countries (Hassan *et al.,* 2021). Many empirical studies have revealed that wars, especially civil wars, negatively affect economic growth and income distribution (Collier & Hoeffler, 2002). In many poor governance regions where high income inequality persists, the poor people are indulged in crime and illegal activities, which is a waste of time and resources not devoted to productive efforts (Barro, 2000). In a country or region where there is a lack of good governance, civil war is likely to occur in that country. Walter (2015) points out that civil wars are much more likely to occur in countries where government authorities are unaccountable to the citizens, where there is no citizen participation in political life, and where information is not transparent. In a weak institutional quality, wealthy people take advantage of tax evasion and exemptions as a result of corruption, and almost the entire tax burden falls on poor people (Andres & Ramlogan-Dobson, 2011).

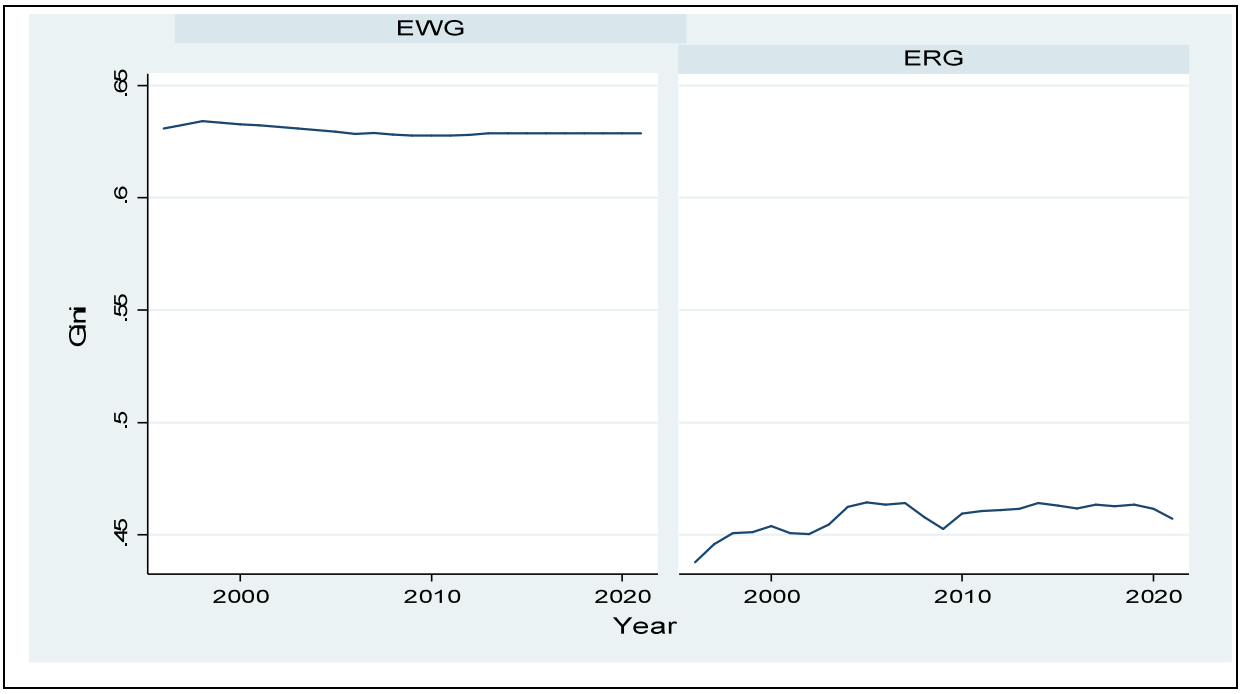
4.1.1 Some Stylized Facts: Trends of Average Income Inequality in EWG and ERG Countries During 1996-2021

Figure 4.1 shows the trends of average income inequality in EWG and ERG countries from 1996 to 2021 and reveals several stylized facts. Firstly, there is a persistent gap between the two types of countries, with the ERG country consistently showing lower inequality levels. This suggests that good governance may be associated with more equitable income distribution. Secondly, income inequality in ERG countries remains relatively stable, with a slight upward trend over the 25-year period.

However, income inequality in EWG countries is higher as compared to that of ERG countries. Beginning in the year 2000, a number of EWG nations, including Burundi, the Central African Republic, and the Democratic Republic of the Congo (DRC), have been engaged in various conflicts that are either internal or cross-border (African Union Commission (AUC)/OECD, 2018), which could be the reason for the high income inequality in such countries. Iraq, Sudan, the Central African Republic, Yemen, and the DRC are involved in numerous conflicts, such as armed factions engaged in combat with national forces and occasionally amongst themselves (Geneva Academy, retrieved from https://geneva-academy.ch/galleries/today-s-armed-conflicts). On the contrary, a slight improvement in income distribution in EWG can be observed from Figure 4.1 over a period of time from 1996 to 2021. The Central African Republic may have seen a rise in its annual

security expenditure over the period from 2012 to 2022 (IMF, 2023). This could also be due to improvements in the governance indicators (RQ, CC, VA, and GE in Iraq; PS, RL, and VA in Sudan; GE, RQ, PS, and RL in Burundi; and CC, RL, RQ, PS, GE, and VA in DR Congo) over the years (The World Bank, WGIs, https://databank.worldbank.org/source/worldwide-governance-indicators). On the other hand, a slight increase in income inequality in ERG countries may be due to a slight decline in some of the indicators of governance quality. The governance indicators (CC and PS in Finland; CC, GE, PS, and RQ in Denmark; GE and VA in New Zealand; CC, RL, and PS in Switzerland; PS and GE in Norway; CC, GE, and PS in Sweden; GE, PS, and RL in Luxemburg; CC, GE, PS, RQ, and VA in Netherlands; CC, GE, PS, and VA in Canada; CC, GE, PS, RL, and VA in Australia; CC, GE, PS, RQ, and RL in Austria; CC and VA in Singapore; CC, GE, PS, and RL in Germany; GE, PS, VA, RQ, and RL in Ireland; CC, VA, GE, PS, RQ, and RL in the U.K.; GE, VA, and PS in Belgium; and CC, GE, PS, VA, RQ, and RL in the USA) has a declining trend over the study period (The World Bank, WGIs, https://databank.worldbank.org/source/worldwide-governance-indicators).

Figure 4.1: Trends of the average Gini coefficient (income inequality) in EWG and ERG countries during 1996-2021



Source: Researcher's construction based on the WID

The structure of this chapter is outlined in this manner: Section 4.2 delves into the theoretical linkages among income inequality-governance and income inequality-democracy; Section 4.3

provides a concise summary of the empirical literature; Section 4.4 details the data gathering techniques and the methodologies utilized; Section 4.5 delves into the interpretation of the empirical results; and Section 4.6 is the conclusion of this chapter.

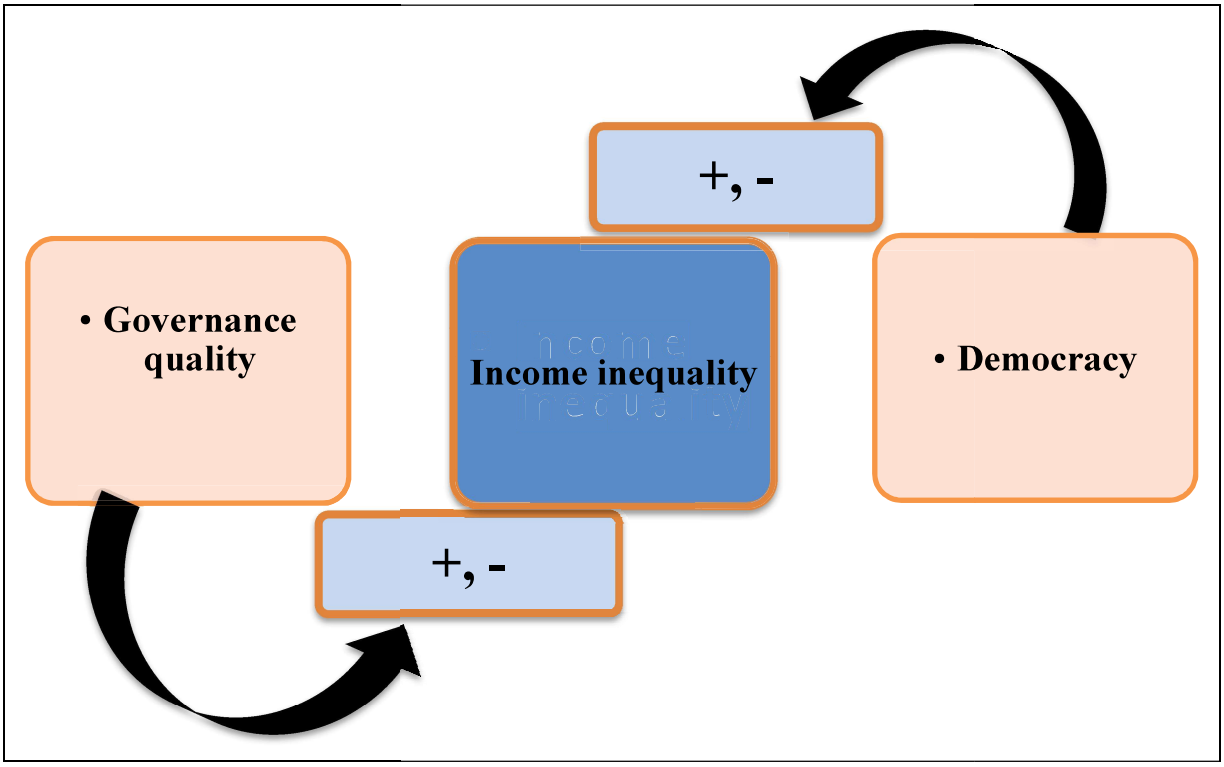
4.2 Conceptual Framework

The conceptual frameworks between income inequality and governance, as well as income inequality and democracy, have been discussed in the following:

Income Inequality and Governance

In recent years, researchers have focused increasingly on examining the relationship between income inequality and governance (Nguyen *et al.,* 2019; Hung *et al.,* 2020; Dossou *et al.,* 2022; Sarkodie & Adams, 2020; Coccia, 2021; Asamoah, 2021). Despite the growing literature on the governance-income inequality nexus, there is still a need to understand the role of the governance system on income inequality. Theoretically, a good governance system helps to reduce income inequality in an economy (Acemoglu *et al.,* 2001; Roy-Mukherjee & Udeogu, 2020). But the same can increase income inequality by fostering the growth of economic activity and therefore inducing larger capitalization, favoring the economic agents with the ability to start business activities (Nguyen *et al.,* 2021). In less developed countries, which are assumed to be at the initial stage of institutional reform, an improvement in institutional quality in the form of institutional reforms imposes higher initial transaction costs on the poorest section of the economy working in the informal or unorganized sector, increasing income inequality (Chong & Calderón, 2000). One of the important roles of good governance is to make the country free from corruption, as this is an effective way to reduce inequality in income and factor ownership (Nguyen *et al.,* 2019). Gupta *et al.* (2002) demonstrated that corruption, which is a sign of a poor governance system, affects not only macroeconomic factors, such as growth and investment, but also the distribution of income. It increases income inequality by distracting scarce development resources from those who need them most and damaging the system and services that are crucial for alleviating poverty and inequality (Diagne, 2021). On the other hand, corruption helps reduce income inequality if the poorer sections of society find employment and a source of income in the informal economy, as many of these individuals lack the personal qualities necessary to work in the formal sector, and employment chances are also limited by institutional and racial discrimination (Andres & Ramlogan-Dobson, 2011).

Figure 4.2: Conceptual link between income inequality-liberal democracy and income inequality-governance quality



Source: Researcher's construction

Income Inequality and Democracy

In the literature, the democracy-income inequality nexus has also occupied an important place (Shen & Yao, 2008; Islam, 2016; Hassan *et al.,* 2021; Bahamonde & Trasberg, 2021). Democracy is based on the principle of representative government and the philosophy of 'one person, one vote' (Reuveny & Li, 2003). The quality of democracy in a country depends on the effectiveness of its governance system. A weak legal system, unaccountable public administration, corruption, and restrictions on freedom of expression can undermine democratic quality (Karataş, 2021). Conversely, countries with higher levels of democracy tend to have better governance qualities (Rivera-Batiz, 2002). To ensure good governance, it is crucial to maintain growth and prevent the intolerable use of power by any group, whether it is the ordinary people or the political elite, as such abuse can hinder growth (Licht *et al.,* 2007). One of the theoretical arguments for democracy is that it helps to reduce income inequality in many ways. Democratic political mechanisms allow state institutions to be more accountable to the demands of the lower section of the population and more enthusiastic about achieving better distributional outcomes, such as through policies that enhance welfare (Balcázar, 2016; Hassan *et al.,* 2021). On the other hand, income inequality is high in

democratic regions if democracy is interacting with state capacity (Bahamonde & Trasberg, 2021). Bahamonde & Trasberg (2021) argued that democracy and high state capacity attract more FDI in the country. FDI inflow may exacerbate income inequality by demanding a higher-skilled labor force, which creates a wage gap between skilled and unskilled labor (Decreuse & Maarek, 2015). Some studies did not find the impact of democracy on income inequality (e.g., Bollen & Jackman, 1985). An increase or decrease in income inequality in democratic institutions is also determined by the group of people. Autocracies dominated by elite groups may see democracy helping in reducing inequality through an allocation of market opportunities to the poor segment of the population via state development and the provision of public goods, while democratization in egalitarian autocracies winning political coalitions includes the interests of upper-class segments and enhanced free market policies that promote the growth of income through entrepreneurial activity and raise inequality levels (Dorsch & Maarek, 2019).

4.3 Literature Review

In the following, a review of previous research has been explained:

Income Inequality and Governance

On the one hand, some studies found that governance helps to reduce income inequality (Nguyen *et al.*, 2019; Sarkodie & Adams, 2020; Roy-Mukherjee & Udeogu, 2020; Uzar, 2023; Huynh *et al.*, 2023), while on the other hand, governance exacerbates income inequality (Adeleye, 2024; Dossou *et al.,* 2022; Nguyen *et al.*, 2021). An investigation by Uzar (2023) across the BRICS-T countries showed that institutional quality helps in the reduction of income inequality. Huynh *et al.* (2023) also found a negative impact of the quality of governance on income inequality. The study by Andres & Ramlogan-Dobson (2011) in Latin America revealed an inverse association between income inequality and corruption, but the study claimed this inverse relationship was due to the existence of an informal economy. Nguyen *et al.* (2019), using provincial panel data in Vietnam, showed that better governance performance is essential to reducing income inequality. Sarkodie & Adams (2020) study in Sub-Saharan African countries revealed that good governance reduces income inequality. An investigation by Roy-Mukherjee & Udeogu (2020) in 39 OECD and Western Balkan countries found that good governance tends to lower income inequality. Adeleye's (2024) study in 46 SSA countries during 2010 to 2019 revealed that institutional

quality and human capital increase inequality, but the interaction of both helps reduce it. A study by Dossou *et al.* (2022) in African countries unveiled the positive impact of governance quality on income inequality. Dossou *et al.* (2022) claimed that the weak nature of governance quality is the reason behind this positive impact. Davis's (2016) study showed that political stability is the factor that exerts a positive impact on income inequality in SSA. A study by Nguyen *et al.* (2021) showed that institutional quality exacerbates income inequality in low-and lower- middle and upper-middle-income economies while helping to reduce it in high-income economies. They argued that better institutions only benefit the larger capitalization, which is the reason for the positive impact of institutional quality on income inequality. But the study by Deyshappriya (2017) showed no significant association between corruption and income inequality.

Income Inequality and Democracy

Empirical evidence on the link between income inequality and democracy also shows mixed results. Sintos *et al*. (2024) showed that increased civil society participation contributes to a reduction in income inequality over the short, intermediate, and extended periods. Gossel's (2024) study in 38 SSA countries revealed that democracy helps in the reduction of income inequality in both the short and long run. The same result was shown by Trinugroho *et al.* (2023) and Tselios (2022) that democracy reduces income inequality. Reuveny & Li (2003) study in a sample of 69 countries found that democracy tends to reduce income inequality. Research by Shen & Yao (2008) in eight Chinese provinces showed that democracy tends to reduce income inequality. A study by Islam (2016) on the effect of political freedom as a factor in income inequality in 83 countries revealed that political freedom reduces income inequality only in democratic countries but not in others. Hassan *et al.* (2021), using the time series data in Pakistan, showed that democracy helps to lower income inequality. Hartwell *et al.* (2019), while examining the role of democratic institutions on the income inequality-natural resources nexus, suggested that democratic institutions help reduce income inequality. But Bahamonde & Trasberg (2021) showed that democracy increases income inequality when combined with high state capacity. Dorsch & Maarek (2019) demonstrated that egalitarian autocracies following democratization tend to become more unequal, whereas the transition to democracy helps to reduce inequality in high-level unequal autocracies. The study by Acheampong *et al.* (2023) in SSA showed that democracy has a positive influence on income inequality. Acemoglu *et al.* (2013) suggested that inequality tends to rise following democratization when the economy has already gone through substantial structural

change. A few studies, e.g., a study by Marsh (2015) in 142 developed, developing, and transitional societies, found no net effect of liberal democracy on income inequality.

4.3.1 Research Gap

Many studies have investigated the nexuses between income inequality and governance, as well as income inequality and democracy, across different regions, countries, or groups of countries. However, these studies do not clearly define the quality of governance, which can vary from extremely weak to extremely strong. This present study distinguishes itself from previous studies in several ways. First, this chapter contributes to the literature by including only EWG and ERG countries. This is essential to determine the contribution of governance quality to income inequality based on the extent of the quality of governance. Second, this study used the Gini coefficient as a proxy for income inequality from the WID, while most of the previous research used Gini coefficient data from the World Income Inequality Database (WIID), the World Bank, the SWIID, etc. Third, FGLS, PCSE, and DK approaches are applied to address the issues of heteroskedasticity, autocorrelation, and CD. Fourth, this study is the first of its kind to study the impact of the interaction of governance quality with liberal democracy on income inequality.

Therefore, an attempt has been made to empirically investigate the impact of governance quality, liberal democracy, and their interaction on income inequality in EWG and ERG countries during the period from 1996 to 2021.

4.4 Data and Methodology

4.4.1 Data Source

This work is based on secondary sources of data. Various indicators, such as income inequality, governance quality, liberal democracy, economic growth, population, urbanization, human development, inflation, unemployment, natural resources, gender equality, and globalization, have been used to analyze the impact of governance quality, liberal democracy, and their interaction on income inequality in EWG and ERG countries (a country list is given in Appendices A7). Table 4.1 represents the variable name, proxy of variables used, symbol, description of the variables, and sources of data.

Table 4.1: Variable list, proxy, symbol used, description, and data sources

Variable	Proxy	Symbol used	Description	Data Source
Income inequality	Gini	INE	Measures inequality in the distribution of income in an economy (0 indicates perfect equality and 1 indicates perfect inequality).	WID
Governance	Governance index	GOV	Six components viz. CC, RL, PV, VA, GE, and RQ (each of the components' score ranges from -2.5 to +2.5)[7].	The World Bank, Worldwide Governance Indicators
Liberal democracy	Liberal democracy index	LD	It provides information on free and fair elections, freedom of expression and association, voting rights, equality before the law, safeguarding of civil liberties, and executive constraints. It goes from 0 (lowest) to 1 (highest) democratic level.	Varieties of Democracy (V-Dem), Core v13
Interaction effect	Governance index × Liberal democracy index	GOV×LD	Combination of governance quality and liberal democracy	-
Economic growth	Gross domestic product per capita (GDPPC) dollar ($) constant, 2022	EG	GDPPC expressed in terms of purchasing power parity (PPP).	WID
Population	Population growth rate (annual %)	POP	Exponential rate of midyear population growth from year t-1 to t (expressed as %).	The World Bank
Urbanization	Urban population growth (annual %)	UB	People living in urban areas.	The World Bank
Human Development	Human Development Index	HDI	Summary indicator of average achievement in three important areas of human development: long and healthy life, knowledge, and standard of living. (Index: low (<0.550), medium (0.550-	UNDP

[7] (i) GE- evaluates the capacity of government to implement policies that are effective and preserve its credibility; (ii) RL- probability of crime and violence, and the extent to which agents trust and adhere to social norms, especially the quality of the courts, police, and contract enforcement; (iii) CC- the degree to which official power is used for personal benefit; (iv) PV- evaluates how resilient a government is to terrorism and political violence; (v) VA- the extent of the ability of country's citizens to influence political decisions; (vi) RQ- government's ability to develop and implement sound regulations and policies that permit and promote the expansion of the private sector (Kaufmann *et al.* 2006).

			0.699), high (0.700-0.799), very high (≥0.800)).	
Inflation	Consumer prices (annual %)	INF	Annual percentage change in the acquisition of a basket of goods and services for the average consumer that may be fixed or changed at predetermined periods (such as yearly).	The World Bank
Unemployment	Unemployment total	UNE	The percentage of the labor force who are unemployed but available for and actively seeking work.	The World Bank
Natural resource	Total Natural resources rent (% of GDP)	NRR	The sum of rents from oil, minerals, forests, natural gas, and coal (hard and soft).	The World Bank
Gender equality	Gender equality	GE	Execution of institutions and initiatives of the country to uphold laws and regulations that support equal opportunities for men and women in the areas of education, health care, the economy and legal protection (0 showing the lowest score, 1 showing the highest score).	The World Bank
Globalization	Globalization index	GLOB	Integration of countries in terms of economic, social, and political factors (score ranges from 0 to 100).	KOF Swiss Economic Institute

Source: Researcher's construction based on secondary sources of data

Note: Using STATA software, interpolation and extrapolation techniques are applied to generate missing values data for inflation in Yemen (2015-2021), DR Congo (2017-2021), rent from natural resources (% of GDP) in Yemen (2019-2021), and governance indicators data for all countries (1997, 1999, and 2021).

4.4.2 Criteria for Country Selection and Classification of Countries

First, the governance quality index[8] as a proxy of governance quality is calculated using the method used by Abbas *et al.* (2021) by averaging six indicators of governance and adding 2.5 to the average value and multiplying the total value by 2 (the score ranges from 0 representing EWG to 10 representing ERG). Then, 118 countries from WID are selected for the period 1996-2021. The selection of the countries and time period is guided by data

[8] The overall index is used as a proxy for governance quality because the use of a single indicator may provide misleading and biased results (Kousar *et al.,* 2020). According to Abbas *et al.* (2021), there seems to be a correlation and influence on one another among the six indicators offered by the WDIs.

availability. Next, average governance scores are calculated for every year for each country during the period from 1996 to 2021. Countries are then ranked accordingly, from ascending to descending order, based on their average governance score. Like Cooray (2009)[9], further, countries are classified into four categories: EWG (score: 0-2.50), weak governance (score: 2.51-5.00), strong governance (score: 5.01-7.50), and ERG (score: 7.51-10.00). Based on data availability, six (6) EWG and seventeen (17) ERG countries fall under the EWG and ERG scores are selected for the present study.

4.4.3 Model Specification

The present study formulates the following general regression equations to investigate the impact of governance quality, liberal democracy, and their interaction on income inequality.

$$\ln INE_{it} = \alpha_{it} + \beta_1 \ln GOV_{it} + \beta_2 \ln LD_{it} + \beta_k \ln Z_{it} + \varepsilon_{it} \quad (1)$$

$$\ln INE_{it} = \alpha_{it} + \beta_1 \ln GOV_{it} + \beta_2 \ln LD_{it} + \beta_3 \ln GOV_{it} \times \ln LD_{it} + \beta_k \ln Z_{it} + \varepsilon_{it} \quad (2)$$

Where ln represents natural log; Z is a matrix of control variables; $\beta_1, \beta_2, \beta_3,$ and β_k are the coefficients of $\ln GOV_{it}$, $\ln LD_{it}$, $\ln GOV_{it} \times \ln LD_{it}$, and $\ln Z_{it}$ respectively; and i and t denote country and time period respectively. $\ln GOV_{it} \times \ln LD_{it}$ is the interaction term of governance quality and liberal democracy. Equation (1) is the regression equation without the interaction effect and Equation (2) is the regression equation with the interaction effect. lnINE is the main dependent variable; $\ln GOV_{it}$, $\ln LD_{it}$, and $\ln GOV_{it} \times \ln LD_{it}$ are main independent variables; economic growth, population, urbanization, human development, inflation, unemployment, natural resources, gender equality, and globalization, are the control independent variables.

All the variables used are transformed into natural log form to bring the data into a normal distribution and reduce heteroskedasticity (Benoit, 2011). In order to convert into a log, the variables with negative values, including population growth, urbanization, and inflation rate, in this study, are converted into positive values by the method used by Busse & Hefeker (2007): $y = \ln (x + \sqrt{(x^2 + 1)})$

[9] Cooray (2009) also distinguished governance levels into very low, low, high, and very high governance.

4.4.4 Estimation Procedure

4.4.4.1 Descriptive Statistics and Bivariate Correlation

Before going to econometric analysis, the descriptive statistics of raw data, such as the mean, standard deviation, maximum, and minimum values of the selected variables and the bivariate correlation between dependent and independent variables, are presented.

4.4.4.2 Panel Unit Root Test

In order to ensure that series are free from unit roots, it is necessary to test the unit root of the series. To check the panel unit root of the variables, the LLC test propounded by Levin-Lin-Chu has been performed (Levin *et al.,* 2002). In LLC, the H_0 assumes that series are non-stationary and H_a assumes that series are stationary.

4.4.4.3 Hausman Test

In panel data, POLS, FE, and RE are popularly used methods. So, in order to choose the most appropriate model between the FE and RE models, a popular test developed by Hausman (1978) has been used for the present study. The Hausman test assumes H_0: RE is suitable and H_a: FE is suitable.

4.4.4.4 Diagnostic Tests

Since autocorrelation and heteroskedasticity are common problems in the FE and RE models in panel data, it is necessary to check the robustness of the series (Greene, 2000). The test for heteroskedasticity developed by Greene (2000) (H_0 : homogeneous) and the test for autocorrelation developed by Wooldridge (2010) (H_0 : no autocorrelation) have been performed to check these problems. Along with these tests, the CD test, proposed by Pesaran (2021), has been used to checked CD issues. The CD test assumes the H_0 of no CD issues.

4.4.4.5 FGLS, PCSE, and DK Regression

In this chapter, FGLS, PCSE, and DK regression are applied due to the presence of autocorrelation, heteroskedasticity, and CD.

4.5 Empirical Results and Discussion

4.5.1 Descriptive Statistics and Bivariate Correlation

Descriptive statistics and bivariate correlation between dependent and independent variables for EWG countries have been reported in Table 4.2 and for ERG countries these are reported in Table 4.3.

Table 4.2 reports that in EWG countries, INE has a mean of 0.63 with a relatively low standard deviation of 0.064. The mean of GOV is 2.056, with a standard deviation of 0.509. LD has a mean score of 0.133 and a variation of 0.068. EG shows a mean of 7394.099, with a standard deviation of 6877.605. POP has a mean of 2.677 with a standard deviation of 0.832. UB mean value is 37.118, with a standard deviation of 17.616. For HDI, the mean value is 0.454 and the standard deviation is 0.099. INF has a standard deviation of 74.595 and a mean value of 26.047. UNE has an average score of 8.352, with a standard deviation of 5.19. NRR has a mean of 22.412 with a standard deviation of 14.711. The average score of GE is 0.35, with a standard deviation of 0.126. GLOB has a mean of 38.797 with a standard deviation of 6.691. The correlation result reveals that EG, POP, HDI, INF, UNE, NRR, GE, and GLOB have a negative correlation with INE. GOV, LD, and UB have a positive correlation with INE.

Table 4.2: Descriptive statistics and correlation for EWG countries

Variable	Mean	Std. Dev.	Min	Max	Correlation coefficient
INE	0.63	0.064	0.544	0.749	1.000
GOV	2.056	0.509	0.956	3.273	0.197
LD	0.133	0.068	0.018	0.277	0.439
EG	7394.099	6877.605	1856.328	24680.857	-0.306
POP	2.677	0.832	-0.85	5.078	-0.299
UB	37.118	17.616	7.412	71.119	0.195
HDI	0.454	0.099	0.283	0.696	-0.166
INF	26.047	74.595	-16.117	513.907	-0.182
UNE	8.352	5.19	0.871	19.292	-0.171
NRR	22.412	14.711	0.256	65.318	-0.032
GE	0.35	0.126	0.096	0.566	-0.106
GLOB	38.797	6.691	22.925	52.007	-0.035

Source: Researcher's calculation

Table 4.3 reports that in ERG countries, INE has a mean of 0.458, with a relatively low standard deviation of 0.05. The mean of GOV is 8.186, with a standard deviation of 0.348. LD has a mean score of 0.798 and its variation is 0.125. EG has a mean of 82256.978 and its standard deviation is 27187.735. POP has an average score of 0.842, with a standard deviation of 0.733. For UB, the mean value is 81.596 with a standard deviation of 10.384. HDI mean value is 0.908 and the standard deviation is 0.03. The average score of INF is 1.731 and the standard deviation is 1.173. UNE mean is 5.96, with a standard deviation of 2.229. NRR has a mean of 1.288 and its standard deviation is 2.293. The average score of GE is 0.814, with a standard deviation of 0.103. GLOB has a mean and standard deviation of 83.985 and 4.44, respectively. The correlation result reveals that GOV, LD, HDI, UNE, NRR, GE, and GLOB have a negative correlation with INE, while EG, POP, UB, and INF have a positive correlation with INE.

Table 4.3: Descriptive statistics and bivariate correlation for ERG countries

Variable	Mean	Std. Dev.	Min	Max	Correlation coefficient
INE	0.458	0.05	0.329	0.626	1.000
GOV	8.186	0.348	6.905	8.894	-0.566
LD	0.798	0.125	0.304	0.898	-0.433
EG	82256.978	27187.735	45616.556	187485.69	0.250
POP	0.842	0.733	-4.17	5.322	0.287
UB	81.596	10.384	57.115	100	0.087
HDI	0.908	0.03	0.785	0.962	-0.103
INF	1.731	1.173	-4.478	6.628	0.108
UNE	5.96	2.229	1.81	15.57	-0.047
NRR	1.288	2.293	0.0002	13.358	-0.112
GE	0.814	0.103	0.494	1	-0.556
GLOB	83.985	4.44	69.693	90.929	-0.379

Source: Researcher's calculation

4.5.2 Panel Unit Root Test

The results of the LLC unit root test given in Table 4.4 show a mixed order of integration, i.e., I(0) and I(1). In EWG countries, lnGOV, lnGOV×lnLD, lnEG, lnUB, lnINF, and lnUNE; and in ERG countries, lnGOV, lnLD, and lnGOV×lnLD are not stationary at level, but after the first difference, all these become stationary, while all other variables are stationary at level.

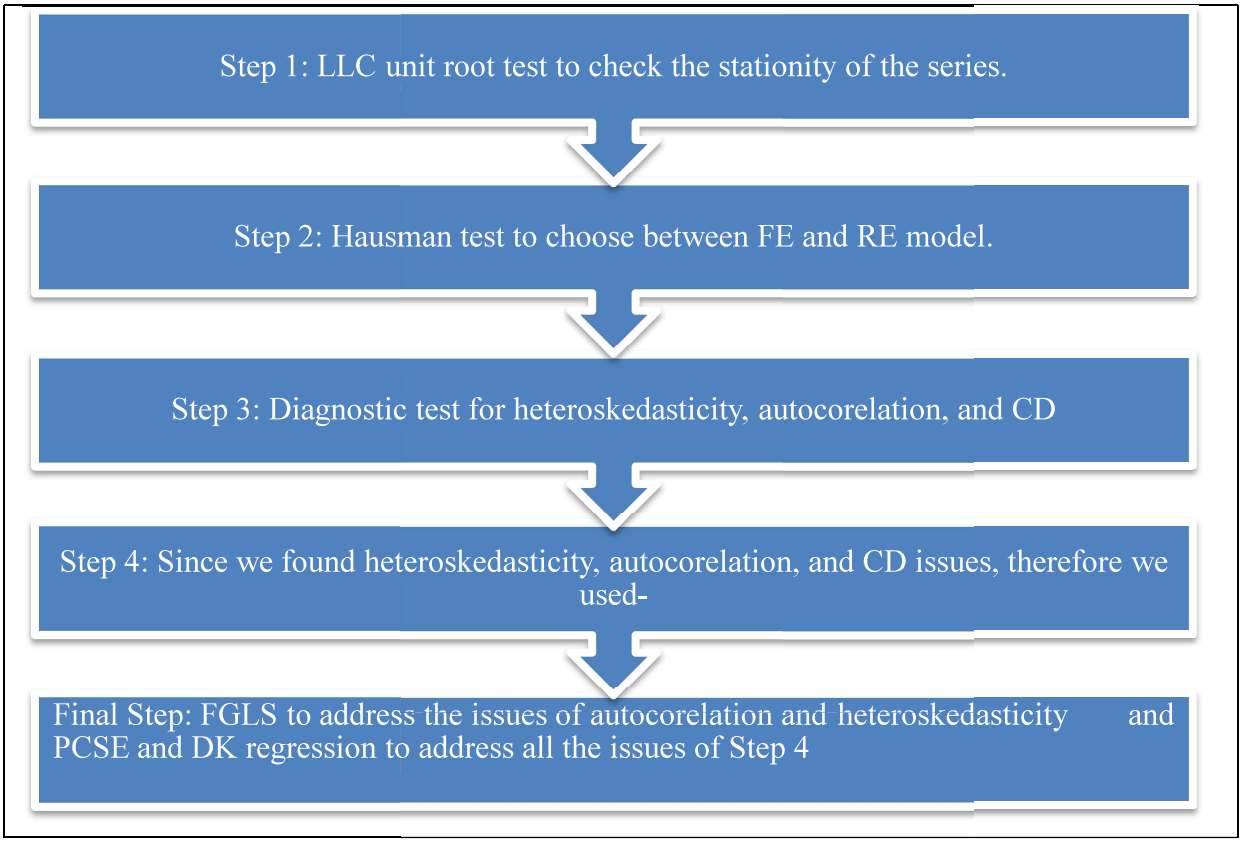
Table 4.4: LLC unit root test

Variables	EWG countries		ERG countries	
	At level	1st difference	At level	1st difference
lnINE	-2.941***	-	-1.568*	-
lnGOV	-0.492	-4.475***	-0.338	-8.749***
lnLD	-3.160***	-	0.037	-6.124***
lnGOV×lnLD	-0.233	-4.576***	-0.541	-6.191***
lnEG	0.970	-3.851***	-5.950***	-
lnPOP	-9.610***	-	-3.418***	-
lnUB	-0.019	-3.680***	-2.288**	-
lnHDI	-1.999**	-	-9.275***	-
lnINF	1.051	-6.150***	-7.171***	-
lnUNE	0.737	-4.160***	-4.797***	-
lnNRR	-2.832***	-	-2.675***	-
lnGE	-1.344*	-	-5.326***	
lnGLOB	-2.673***	-	-8.000***	-

Source: Researcher's calculation

Note: *, **, and *** indicate levels of significance at 10%, 5% and 1%, respectively. In EWG and ERG countries, lnUB and lnINE, stationary has been considered including time trend respectively.

Figure 4.3: Steps to analyze the regression results



Source: Researcher's construction

4.5.3 Diagnostic Tests and Appropriate Regression

Combination of both cross-sectional and time dimensions, panel data has some benefits, such as controlling heterogeneity in prediction, increasing the degree of freedom, and obtaining more accurate parameters (Baltagi, 2005). To choose which model is appropriate between the FE and RE models, the Hausman test proposed by Hausman (1978) has been performed. The Hausman test in Table 4.5 shows that the FE model is suitable for EWG (with and without interaction effects) and ERG (with and without interaction effects). But the OLS, FE, and RE estimation models cannot be appropriate in panel data structures because of the country-specific heterogeneities and the presence of autocorrelation, which thereby may provide biased and ineffective results (Sulemana *et al.,* 2019; Greene, 2000). So, before estimating the coefficients, heteroskedasticity (Greene, 2000) and autocorrelation (Wooldridge, 2010) issues are checked as displayed in Table 4.5. The results show the issues of heteroskedasticity and autocorrelation; therefore, the FGLS method will be used for the study (Parks, 1967; Reed & Ye, 2009). Compared to other OLS estimates, this approach appears to be more efficient (Bai *et al.,* 2021). Along with FGLS, the PCSE method is used because it offers more reliable results (Zhang & Zhao, 2014). The PCSE method is considered more robust to errors (disturbances) that are heteroscedastic, cross-sectionally correlated, and auto-correlated (Beck & Katz, 1995).

Table 4.5: Diagnostic tests

Test	EWG (Without interaction effect)	EWG (With interaction effect)	ERG (Without interaction effect)	ERG (With interaction effect)
Hausman test	132.80***	131.69***	38.01***	64.78***
Heteroskedasticity test	5065.53***	5426.49***	2242.30***	2241.09***
Autocorrelation test	219.684***	224.096***	37.692***	37.406***
CD test	3.011***	3.235***	1.749*	1.956*

Source: Researcher's calculation

Note: *, ** and *** indicates levels of significance at 10%, 5% and 1% respectively.

Another serious issue in panel data is the CD, which should be considered before proceeding to the main analysis. The occurrence of CD may create biased and unreliable results. Hence, the CD test is checked by using the method proposed by Pesaran (2021). This CD problem can be solved using the DK regression standard error approach (Driscoll & Kraay, 1998). The DK regression approach has a number of benefits, like robust estimators, handling missing

values, and being appropriate for both short and long time spans by addressing heteroskedasticity and spatial dependency problems (Driscoll & Kraay, 1998). Overall, the diagnostic tests presented in Table 4.5 show the presence of autocorrelation, heteroskedasticity, and CD issues. So, to control all these issues, FGLS, PCSE, and DK estimation approaches are used.

4.5.4 FGLS, PCSE, and DK Regression Results

Table 4.6 reports the results for EWG countries and Table 4.7 reports the results for ERG countries. In both Tables 4.6 and 4.7, columns 1, 3, and 5 represent the impact of governance quality and liberal democracy on income inequality without the interaction effect, and columns 2, 4, and 6 represent the impact of governance quality and liberal democracy on income inequality with the interaction effect.

Table 4.6: FGLS, PCSE, and DK results for EWG countries (lnINE: dependant variable)

Independent variables	FGLS(Without interaction effect)	FGLS(With interaction effect)	PCSE (Without interaction effect)	PCSE (With interaction effect)	DK(Without interaction effect)	DK(With interaction effect)
	1	2	3	4	5	6
lnGOV	-0.108	-0.281***	-0.108	-0.281**	-0.108*	-0.281***
	(-1.60)	(-2.68)	(-1.46)	(-2.50)	(-1.730)	(-3.860)
lnLD	0.093***	0.094***	0.093***	0.094***	0.093***	0.094***
	(8.75)	(8.97)	(7.13)	(7.33)	(7.900)	(7.700)
lnGOV×LD	-	-0.09**	-	-0.09*	-	-0.090**
		(-2.13)		(-1.93)		(-2.240)
lnEG	-0.015	0.009	-0.015	0.009	-0.015	0.009
	(-0.23)	(0.13)	(-0.27)	(0.16)	(-0.260)	(0.150)
lnPOP	-0.042***	-0.045***	-0.042***	-0.045***	-0.042**	-0.045**
	(-2.84)	(-3.06)	(-2.98)	(-3.23)	(-2.120)	(-2.300)
lnUB	-3.581***	-3.674***	-3.581***	-3.674***	-3.581**	-3.674**
	(-4.25)	(-4.42)	(-4.27)	(-4.45)	(-2.180)	(-2.230)
lnHDI	-0.42***	-0.421***	-0.42***	-0.421***	-0.420***	-0.421***
	(-7.42)	(-7.55)	(-9.45)	(-9.65)	(-9.030)	(-9.040)
lnINF	0.001	0.001	0.001	0.001	0.001	0.001
	(0.25)	(0.27)	(0.27)	(0.29)	(0.270)	(0.280)
lnUNE	-0.066	-0.074	-0.066	-0.074	-0.066	-0.074
	(-0.73)	(-0.82)	(-0.67)	(-0.75)	(-0.430)	(-0.460)
lnNRR	0.008	0.007	0.008	0.007	0.008	0.007
	(1.00)	(0.93)	(1.02)	(0.95)	(0.790)	(0.730)
lnGE	-0.118***	-0.12***	-0.118***	-0.12***	-0.118***	-0.120***
	(-7.20)	(-7.39)	(-8.83)	(-8.90)	(-11.450)	(-11.120)
lnGLOB	0.214***	0.217***	0.214***	0.217***	0.214***	0.217***
	(3.74)	(3.84)	(4.17)	(4.24)	(4.660)	(4.550)
Constant	-1.429***	-1.432***	-1.429***	-1.432***	-1.429***	-1.432***

	(-5.74)	(-5.84)	(-6.54)	(-6.59)	(-5.950)	(-5.830)
R squared	-		0.56	0.57	0.56	0.57

Source: Researcher's calculation

Note: *, **, and *** indicate levels of significance at 10%, 5% and 1%, respectively; Z statistics (column 1, 2, 3, and 4) and t statistics (column 5 and 6) in parentheses.

Table 4.7: FGLS, PCSE, and DK results for ERG countries (lnINE: dependant variable)

Independent variables	FGLS (Without interaction effect)	FGLS (With interaction effect)	PCSE (Without interaction effect)	PCSE (With interaction effect)	DK (Without interaction effect)	DK (With interaction effect)
	1	2	3	4	5	6
lnGOV	-0.509	-0.486	-0.509	-0.486	-0.509	-0.486
	(-1.49)	(-0.95)	(-1.39)	(-0.86)	(-1.500)	(-1.680)
lnLD	-0.814**	-1.012	-0.814**	-1.012	-0.814**	-1.012
	(-2.48)	(-0.31)	(-1.97)	(-0.26)	(-2.630)	(-0.520)
lnGOV×LD	-	0.097	-	0.097	-	0.097
		(0.06)		(0.05)		(0.110)
lnEG	0.043**	0.043**	0.043***	0.043***	0.043*	0.043*
	(2.23)	(2.23)	(3.00)	(2.99)	(1.740)	(1.730)
lnPOP	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012
	(-1.20)	(-1.19)	(-1.00)	(-0.99)	(-0.790)	(-0.780)
lnUB	0.116***	0.116***	0.116***	0.116***	0.116***	0.116***
	(3.87)	(3.87)	(5.99)	(6.00)	(4.750)	(4.790)
lnHDI	1.169***	1.17***	1.169***	1.17***	1.169***	1.170***
	(6.66)	(6.65)	(6.96)	(6.96)	(4.320)	(4.330)
lnINF	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***
	(2.90)	(2.90)	(2.80)	(2.80)	(3.420)	(3.490)
lnUNE	0.049***	0.049***	0.049***	0.049***	0.049***	0.049***
	(4.25)	(4.25)	(3.71)	(3.72)	(3.020)	(3.020)
lnNRR	0.005*	0.005*	0.005**	0.005**	0.005*	0.005
	(1.88)	(1.87)	(2.38)	(2.37)	(1.720)	(1.690)
lnGE	-0.643***	-0.643***	-0.643***	-0.643***	-0.643***	-0.643***
	(-14.37)	(-14.37)	(-17.27)	(-17.28)	(-17.180)	(-17.190)
lnGLOB	-0.645***	-0.645***	-0.645***	-0.645***	-0.645***	-0.645***
	(-7.04)	(-7.04)	(-7.90)	(-7.90)	(-5.540)	(-5.530)
Constant	0.958*	0.958*	0.958**	0.958**	0.958	0.958
	(1.89)	(1.89)	(2.11)	(2.11)	(1.360)	(1.360)
R-squared	-	-	0.52	0.52	0.52	0.52

Source: Researcher's calculation

Note: *, **, and *** indicate levels of significance at 10%, 5% and 1%, respectively; Z statistics (column 1, 2, 3, and 4) and t statistics (column 5 and 6) in parentheses.

Box 4.1: Regression results of EWG and ERG countries in equation form

EWG countries

FGLS (without interaction effect)

INE = -1.429*** - 0.108 GOV + 0.093*** LD - 0.015 EG - 0.042***POP - 3.581*** UB - 0.42*** HDI + 0.001 INF - 0.066 UNE + 0.008 NRR - 0.118*** GE + 0.214*** GLOB

FGLS (with interaction effect)

INE = -1.432*** - 0.281*** GOV + 0.094*** LD - 0.09** GOV×LD + 0.009 EG - 0.045*** POP - 3.674*** UB - 0.421*** HDI + 0.001 INF - 0.074 UNE + 0.007 NRR - 0.12*** GE + 0.217*** GLOB

PCSE (without interaction effect)

INE = -1.429*** - 0.108 GOV + 0.093*** LD - 0.015 EG - 0.042***POP - 3.581*** UB - 0.42*** HDI + 0.001 INF - 0.066 UNE + 0.008 NRR - 0.118*** GE + 0.214*** GLOB

R squared: 0.56

PCSE (with interaction effect)

INE = -1.432*** - 0.281** GOV + 0.094*** LD - 0.09* GOV×LD + 0.009 EG - 0.045*** POP - 3.674*** UB - 0.421*** HDI + 0.001 INF - 0.074 UNE + 0.007 NRR - 0.12*** GE + 0.217*** GLOB

R squared: 0.57

DK (without interaction effect)

INE = -1.429*** - 0.108* GOV + 0.093*** LD - 0.015 EG - 0.042** POP - 3.581** UB - 0.420*** HDI + 0.001 INF - 0.066 UNE + 0.008 NRR - 0.118*** GE + 0.214*** GLOB

R squared: 0.56

DK (without interaction effect)

INE = -1.432*** - 0.281*** GOV + 0.094*** LD - 0.090** GOV×LD + 0.009 EG - 0.045** POP - 3.674** UB - 0.421*** HDI + 0.001 INF - 0.074 UNE + 0.007 NRR - 0.120*** GE + 0.217*** GLOB

R squared: 0.57

ERG countries

FGLS (without interaction effect)

INE = 0.958* - 0.509 GOV - 0.814** LD + 0.043** EG - 0.012 POP + 0.116*** UB + 1.169*** HDI + 0.019*** INF + 0.049*** UNE + 0.005* NRR - 0.643*** GE - 0.645***

GLOB

FGLS (with interaction effect)

INE = 0.958* - 0.486 GOV - 1.012 LD + 0.097 GOV×LD + 0.043** EG - 0.012 POP + 0.116*** UB + 1.17*** HDI + 0.019*** INF + 0.049*** UNE + 0.005* NRR - 0.643*** GE - 0.645*** GLOB

PCSE (without interaction effect)

INE = 0.958** - 0.509 GOV - 0.814** LD + 0.043*** EG - 0.012 POP + 0.116*** UB + 1.169*** HDI + 0.019*** INF + 0.049*** UNE + 0.005** NRR - 0.643*** GE - 0.645*** GLOB

R squared: 0.52

PCSE (with interaction effect)

INE = 0.958** - 0.486 GOV - 1.012 LD + 0.097 GOV×LD + 0.043*** EG - 0.012 POP + 0.116*** UB + 1.17*** HDI + 0.019*** INF + 0.049*** UNE + 0.005** NRR - 0.643*** GE - 0.645*** GLOB

R squared: 0.52

DK (without interaction effect)

INE = 0.958 - 0.509 GOV - 0.814** LD + 0.043* EG - 0.012 POP + 0.116*** UB + 1.169*** HDI + 0.019*** INF + 0.049*** UNE + 0.005* NRR - 0.643*** GE - 0.645*** GLOB

R squared: 0.52

DK (with interaction effect)

INE = 0.958 - 0.486 GOV - 1.012 LD + 0.097 GOV×LD + 0.043* EG - 0.012 POP + 0.116*** UB + 1.170*** HDI + 0.019*** INF + 0.049*** UNE + 0.005 NRR - 0.643*** GE - 0.645*** GLOB

R squared: 0.52

Source: Researcher's calculation

Note: *, **, and *** indicate levels of significance at 10%, 5% and 1%, respectively.

Impact of Governance Quality: Table 4.6 (models 2, 4, 5, and 6) results show that governance quality has a significantly negative impact on income inequality (reject H_0 of our study). This result is in line with Andres & Ramlogan-Dobson (2011), who showed an inverse connection between corruption and income inequality, but contradicts the statement that a weak governance system increases income inequality, as suggested by Ullah *et al.*

(2021) and Dossou *et al.* (2022). A possible reason could be drawn in line with Andres & Ramlogan-Dobson (2011), who stated that if the poorer sections of society find employment and a source of income in the informal economy, as many of these individuals lack the personal qualities necessary to work in the formal sector, and employment chances are also limited by institutional and racial discrimination. It may be true in the case of EWG countries, as 85.8 percent of employment in Africa and 68.6 percent in the Arab States are informal and are an important source of employment [International Labour Organization (ILO), 2018].

In table 4.7 (all models), governance quality has an insignificantly negative impact on income inequality (fail to reject H_0 of our study). Although robust governance quality is seen as beneficial, a further improvement in governance quality in such countries perhaps does not play a significant role in reducing income inequality.

Impact of Liberal Democracy: in EWG countries, Table 4.6 (models 1, 2, 3, 4, 5, and 6) shows that liberal democracy has a significantly positive impact on income inequality (reject H_0 of our study). This result is parallel to the studies of Shahbaz *et al.* (2017), Lee & Lee (2018), and ElGindi (2017). Since individuals may benefit from more exposure to democracy through welfare-augmenting policies (Balcázar, 2016), this result reveals that perhaps the democracy in such countries is not up to the level that helps the poor to gain the benefits of public policy, thereby widening the gap between rich and poor.

In ERG countries, Table 4.7 (models 1, 3, and 5) shows that liberal democracy has a significantly negative impact on income inequality (reject H_0 of our study). This result is the same as that of Trinugroho *et al.* (2023), Gossel (2024), Reuveny & Li (2003), Anyanwu *et al.* (2016), and Hassan *et al.* (2021), whose study found a negative effect of democracy on income inequality. This result indicates that a higher level of democracy in the country can force the authority or the government to influence policies in favor of disadvantageous people to improve their income status (Balcázar, 2016; Hassan *et al.*, 2021).

Impact of Interaction: The interaction impact of EWG countries is negative and significant in Table 4.6 (models 2, 4, and 6) (reject H_0 of our study). This result indicates that in EWG countries, the interaction of governance quality with the enhancement of a democratic environment can mitigate income inequality in these countries.

But in the case of ERG countries in Table 4.7, the interaction effect is positive and insignificant in all models (fail to reject H_0 of our study). Perhaps the interaction of governance quality is not required for enhancing democracy to reduce income inequality in ERG countries.

Impact of Economic Growth: In Table 4.6 (models 1, 2, 3, 4, 5, and 6), the coefficient of GDP is not significant (fail to reject H_0) and in Table 4.7 (models 1, 2, 3, 4, 5, and 6), the coefficient of GDP is positive and significant (reject H_0). This study is in line with Odedokun & Round (2004), Munir & Sultan (2017), Lee & Lee (2018), and Adams & Klobodu (2019). This suggests the possibility that an increase in economic growth favors the rich more than the poor and thereby increases income inequality (Aiyar & Ebeke, 2019).

Impact of Population: Table 4.6 (models 1, 2, 3, 4, 5, and 6) shows a negative and significant result (reject H_0). The negative effect result is the same with Walujadi *et al.* (2022) and Butler *et al.* (2020). Perhaps these countries specialize in the production of those goods and exports that absorb more labor, which raises the demand and wages of low-skilled workers and thus helps to reduce income inequality (Han *et al.* 2012).

Table 4.7 (models 1, 2, 3, 4, 5, and 6) shows the impact of population on income inequality is negative and insignificant (fail to reject H_0).

Impact of Urbanization: in Table 4.6 (models 1, 2, 3, 4, 5, and 6), urbanization has a significantly negative impact on income inequality (reject H_0). This result is in line with Johansson & Wang (2014) and Ha *et al.* (2019). This suggested that people residing in rural areas with little or no land migrate to urban areas to work in factories that pay them higher wages than their previous jobs, which raises their income and helps reduce income inequality (Ha *et al.*, 2019).

Table 4.7 (models 1, 2, 3, 4, 5, and 6) shows a positive and significant impact of urbanization on income inequality (reject H_0). This result is similar to that of Sulemana *et al.* (2019), Munir & Sultan (2017), Adams & Klobodu (2019), Padhan *et al.* (2022), Taresh *et al.* (2021), and Dossou (2023). Perhaps ERG countries have touched the highest threshold level of urbanization; therefore, the influx of low-skilled rural migrants by exacerbating the wage gap between formal and informal sectors in urban areas, as well as the skill gap between rural and urban workers, might increase income inequality (Sulemana *et al*., 2019).

Impact of HDI: Table 4.6 (models 1, 2, 3, 4, 5, and 6) shows HDI has a statistically significant and negative impact on income inequality (reject H_0). This result is in line with Amiti & Cameron (2012), Taresh *et al.* (2021), and Walujadi *et al.* (2022). This negative impact could be due to the small differential in HDI[10] among the people in these countries (Grimm *et al.*, 2008).

On the other hand, Table 4.7 (models 1, 2, 3, 4, 5, and 6) shows HDI has a significantly positive impact on income inequality (reject H_0). This result is in line with Alvarado *et al.* (2021) and Prawoto & Cahyani (2020). Since ERG countries are HICs, the association of one of the components of HDI, i.e., education, with substantial expenses can restrict educational opportunities for individuals from lower-income backgrounds, where the high cost of education can drastically curtail the ability of those in the lowest income brackets to access educational resources (Carr-Hill, 2020). So, the further improvement in HDI may be associated with a higher level of education, which in turn leads to higher wages as compared to a lower level of education (Taresh *et al.*, 2021; Prawoto & Cahyani, 2020).

Impact of Inflation: In Table 4.6 (models 1, 2, 3, 4, 5, and 6), the impact of inflation on income inequality is positive and not significant (fail to reject H_0).

Table 4.7 (models 1, 2, 3, 4, 5, and 6) shows a significantly positive impact of inflation on income inequality (reject H_0). The result is in line with Zandi *et al.* (2022), Berisha *et al.* (2020), Baloch *et al.* (2018), Deyshappriya (2017), Shahpari & Davoudi (2014), Thalassinos *et al.* (2012), Hassan *et al.* (2021), Li & Zou (2002), Sehrawat & Singh (2019), Ganaie *et al.* (2018), Sehrawat & Giri (2015), and Law & Soon (2020). According to Deyshappriya (2017), inflation can exacerbate income inequality by eroding the real income of the lower-income groups and forcing the middle-income groups into lower economic positions.

Impact of Unemployment: Table 4.6 (models 1, 2, 3, 4, 5, and 6) revealed an insignificant negative impact of unemployment on income inequality (fail to reject H_0).

On the other hand, Table 4.7 (models 1, 2, 3, 4, 5, and 6) indicates that unemployment has a significantly positive impact on income inequality (reject H_0). This result is in line with Shahpari & Davoudi (2014), Monnin (2014), Deyshappriya (2017), Mocan (1999), Prawoto

[10] EWG countries in our study have low HDI levels (less than 0.550) except Iraq, which has a medium HDI (0.550-0.699) (UNDP, Retrieved from https://hdr.undp.org/data-center/human-development-index#/indicies/HDI).

& Cahyani (2020), Taresh *et al.* (2021), and Zandi *et al.* (2022). Unemployment greatly lowers the income share of the bottom section of the population, except for the richest segment (Mocan, 1999; Deyshappriya, 2017), which is the possible reason for income inequality.

Impact of Natural Resources: Table 4.6 (models 1, 2, 3, 4, 5, and 6) shows that natural resources have a positive and insignificant impact on income inequality in EWG countries (fail to reject H_0).

Table 4.7 (models 1, 2, 3, 4, and 5) shows that natural resources have a positive impact on income inequality in ERG countries (reject H_0). The findings align with the studies by Akpa (2023), ElGindi (2017), Alvarado *et al.* (2021), and Teng *et al.* (2024). Over the last five decades, the extraction of Earth's natural resources has tripled due to massive infrastructure development and increased material consumption in developed economies including ERG countries (UN, 2024). The rents derived from natural resources are complex and entrepreneurs are particularly interested in seeking rents from certain natural resources where entrepreneurs in advanced economies or ERG countries have stronger rent-seeking behaviors as compared to other economies (Canh *et al.*, 2021). The resource curse theory suggests that the wealth derived from natural resources tends to be monopolized by the elite, exacerbating the income inequality between society's upper and lower classes as the allocation of resources does not benefit the less affluent population segments (Anyanwu, 2016).

Impact of Gender Equality: In both Tables 4.6 and 4.7 (models 1, 2, 3, 4, 5, and 6), gender equality has a negative effect on income inequality (reject H_0). Consistent with the findings of Baloch *et al.* (2018) and Grotti & Scherer (2016), increased female participation in the labor market correlates with reduced income inequality. This indicates that empowering women economically leads to a more equitable sharing of income, fostering collective well-being and prosperity (IMF, 2018).

Impact of Globalization: Table 4.6 (models 1, 2, 3, 4, 5, and 6) shows a positive and significant impact of globalization on income inequality (reject H_0). The result is parallel to the studies by Munir & Sultan (2017), Dreher & Gaston (2008), Roy-Mukherjee & Udeogu (2020), Sethi *et al.* (2021), Padhan *et al.* (2022), and Park (2017). This result indicates that globalization benefits the rich section of the population more than low income groups (Sağlam, 2021). Globalization also attracting FDI inflow may make income inequality worse

by demanding a more highly skilled labor force and widening the pay difference between skilled and unskilled employees (Decreuse & Maarek, 2015; Çelik & Basdas, 2010).

Table 4.7 (models 1, 2, 3, 4, 5, and 6) shows globalization has a significantly negative impact on income inequality (reject H_0). This result is similar to the studies of Zhou *et al.* (2011), ElGindi (2017), and Ullah *et al.* (2021). This result shows that globalization boosts investments, creates job opportunities, and increases wages for low-skilled and unskilled labor forces, which minimizes the income gap between skilled and unskilled labor (Ullah *et al.,* 2021).

4.6 Conclusion

This chapter investigates the impact of governance quality, liberal democracy, and their interaction on income inequality in EWG and ERG countries using panel data during the period 1996-2021. The study runs the FGLS, PCSE, and DK regression methods with and without the interaction effect to find out their impact on income inequality. The study finds that in EWG countries, governance quality has a negative effect on income inequality, but the result is insignificant for ERG countries. Liberal democracy has a positive impact on income inequality in EWG countries and a negative effect on income inequality in ERG countries. The interaction effect shows a negative effect in EWG countries, but the result is positive and not significant for ERG countries. In addition, the control variables- population, urbanization, HDI, and gender equality have a negative impact on income inequality in EWG countries; conversely, globalization has a positive impact on income inequality in these countries. Gender equality and globalization have a negative impact, while economic growth, urbanization, HDI, inflation, unemployment, and natural resources have a positive impact on income inequality in ERG countries.

In EWG countries, the H_0 of governance quality, liberal democracy, and their interaction is rejected. In ERG countries, the H_0 of governance quality and interaction term is accepted (fail to reject); while H_0 of liberal democracy is rejected. For control variables, in EWG countries, the H_0 of economic growth, inflation, unemployment, and natural resources is accepted (fail to reject); while the H_0 of population, urbanization, HDI, gender equality, and globalization is rejected. In ERG countries, the H_0 of population is accepted (fail to reject); while the H_0 of economic growth, urbanization, HDI, inflation, unemployment, natural resources, gender equality, and globalization is rejected.

The next Chapter 5 investigates how determinants of income inequality with a special focus on unemployment and governance quality behave in a country, India, which comes under the categories of LMI and weak governance quality.