

Relationship between international remittances, political stability and income inequality: evidence from MENA countries

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Abstract

Purpose – Despite the significant role of remittances in the Middle East and North Africa (MENA) region, their impact on income inequality has received limited attention in related research, especially in times of political instability. Therefore, this paper explores the moderating effect of political stability on the strengthening of the relationship between remittance inflows and income inequality in MENA countries over the period 1996–2022.

Design/methodology/approach – This paper utilizes the pooled mean group (PMG) approach. For robustness, Dumitrescu and Hurlin's (2012) panel Granger non-causality test has been conducted, revealing the absence of reverse causality.

Findings – This paper demonstrates that remittance inflows increase income inequality in MENA recipient countries, indicating that most individuals receiving remittances in the MENA region are predominantly from well-off families. In addition, political stability reduces income inequality in MENA recipient countries, while remittance inflows increase income inequality when the polity becomes less stable.

Practical implications – We recommend addressing obstacles faced by low-income groups seeking migration, especially in countries with high unemployment rates, such as deficiencies in education, skills, information asymmetry and financial constraints. Additionally, supplementary policies, such as directing resources toward pro-poor projects, particularly those that improve education, health and infrastructure, should be implemented to mitigate the adverse effects of remittances on income distribution. Finally, priority must be given to policies that promote political stability to create a business environment conducive to human and physical investments.

Originality/value – The paper addresses the impact of remittances on income inequality in the MENA region, which has received limited attention in previous research.

Keywords Income inequality, Remittances, MENA, Political stability, Pooled mean group,

Granger non-causality

Paper type Research paper

1. Introduction

The Middle East and North Africa (MENA) region [1] possesses two-thirds of the world's known petroleum reserves and has a prominent strategic and historical location (Roudi-Fahimi and Kent, 2007). However, it has emerged as the region with the highest income inequality globally (WID, 2022). According to the World Inequality Database (2022), the MENA region has witnessed a significant and consistent rise in income inequality over the past 3 decades

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([Alhasnawi et al., 2024](#)). The Gini index, which measures income inequality, averaged 0.71 in 1996 and then slightly declined to 0.67 in 2010 due to notable economic progress in the region during that period. Despite this, the gap between the rich and the poor has not improved significantly in most countries in the area, and this was one of the reasons for the outbreak of the Arab Spring revolutions in 2010, which started in Tunisia and then spread to many other countries in the MENA. The political, economic, and social instability resulting from the uprisings and revolutions of the Arab Spring exacerbated existing income inequality in many MENA countries, with some experiencing significant increases in wealth disparity. However, the impacts varied across the region, and other factors beyond the Arab Spring also contributed to changes in income distribution. Since 2010, the Gini coefficient has increased until it reached 0.69 in 2020. In addition, several research studies have highlighted that a rise in income inequality is frequently associated with an increase in crime rates, the erosion of social cohesion, hindered economic growth, and, ultimately, a greater prevalence of poverty and other societal problems ([Andrei and Craciun, 2015](#); [Coccia, 2018](#); [Lahouij, 2017](#); [Min et al., 2015](#)).

Over the past few decades, the inflow of remittances has become a major source of external financing for developing countries, surpassing other forms of international financial flows such as foreign aid and portfolio investments ([De Haas, 2006](#); [Heilmann, 2006](#); [Ebeke, 2012](#)). In fact, the amount of money sent through remittances has exceeded that of foreign direct investment (FDI) in recent years. In 2022, developing countries received approximately \$600 billion in remittances, while FDI inflows amounted to approximately \$182 billion during the same period ([World Bank, 2022](#)). According to [World Bank data \(2023\)](#), the MENA region took the lead in inward remittances as a proportion of GDP compared to other areas worldwide. Moreover, the inflow of remittances plays a vital role in financing development in MENA, helping countries fill the investment gap, stimulating sustainable economic growth, and tackling poverty. This is especially significant considering the decrease in domestic funding sources, the volatility of international oil prices, the substantial public debt levels, and the notable decline in other external financial resources, such as FDI and foreign aid, across most MENA countries in recent years ([Elorabi et al., 2023](#)).

With nations like Egypt, Morocco, Tunisia, and Jordan sending sizable immigrants to GCC states and Europe, the MENA region is uniquely positioned to be both a major source and destination for migrant labor. As such, it exhibits complex remittance dynamics, where inflows frequently exceed 10% of GDP while also acting as a double-edged sword, reducing rural poverty while exacerbating inequality due to high migration costs that favor wealthier families, especially in non-oil states like Lebanon. Furthermore, migration patterns that are dominated by men change the power dynamics within households and increase the vulnerabilities of women who handle remittances. Political instability causes feedback loops where remittance-dependent households, like Egypt's experience of migration-induced remittance reliance amid economic stagnation, further entrench inequality and delay structural reforms. These loops are caused by the Arab Spring's legacy, high youth unemployment, conflict-induced forced migration, and the contrasting models of rentier authoritarianism in oil-rich GCC versus austerity in non-oil states. All things considered, MENA provides an ideal setting for investigating the relationship between crisis-driven, frequently unofficial remittance flows, structural inequality, and political fragility. This research can provide important insights on the relationship between international remittances and inequality, taking into account the role of political instability.

The volume of remittances sent through official channels to MENA countries has experienced a significant increase, from approximately \$11.3 billion in 1996 to approximately \$58.7 billion in 2020 ([WDI, 2022](#)). Furthermore, remittances flowing into MENA surpassed other primary external sources of financing, including FDI inflows. According to the [World Bank \(2022\)](#), the size of remittances in 2022 amounted to approximately \$65.8 billion, exceeding the FDI inflows of \$27.8 billion in the same year. Additionally, remittances are considered relatively stable and less volatile than other financial flows, making them a reliable

source of international financing, especially during economic downturns and crises. Despite the significant role of remittances in the MENA region, their impact on income inequality in the region has received limited research attention.

Migrant remittance is a lifeline for many families because it provides receiving families with additional resources, such as food, housing, clothing, education, and healthcare, to meet their basic needs. This increased purchasing power improves quality of life and narrows the income gap between different socioeconomic groups (Miftah and Bouoiyour, 2014; Olowa and Shittu, 2012; Tsauroi, 2018). Additionally, remittance recipients often save a portion of the funds they receive, which can contribute to asset accumulation. These savings can be invested in productive assets or used as a financial safety net, thus enhancing the economic well-being of receiving families. The accumulation of assets through remittances can help disadvantaged households build wealth, bridge the income gap, and reduce income inequality (John, 2017; Miftah and Bouoiyour, 2014; Tsauroi, 2018).

In addition, remittances can catalyze entrepreneurial activities and small business development through access to productive inputs needed for expanding or setting up businesses. Receiving families may utilize remittances to start or expand their businesses, generating income and employment opportunities. This not only improves the economic prospects of the remittance recipient's family but also creates job opportunities for others in the community, thereby reducing income inequality (Bkwayep and Tsafack, 2020; Borja and Hall, 2018; Garip, 2014; Howell, 2017; Mallick *et al.*, 2020). Moreover, remittance funds can be directed toward investments in education and skill development. By financing educational expenses, vocational training, or professional certifications, remittances contribute to improving the human capital of receiving families. Enhanced education and skills enhance employability, leading to higher-paying jobs and reducing income disparities (Olowa and Shittu, 2012; Tsauroi, 2018; Waheed and Shittu, 2012).

Several studies have shown that remittances have a significant impact on reducing income inequality (Akobeng, 2016; Anyanwu, 2016; Bkwayep and Tsafack, 2020; Tsauroi, 2018), while a few others have confirmed the opposite. Indeed, the impact of remittances on income distribution inequality in receiving nations relies on receiving families (Howell, 2017; John, 2017; Mollers and Meyer, 2014). Inward remittances can reduce income inequality when most remittance recipients are from low-income groups in society and vice versa. On the other hand, governance and political stability may be crucial in strengthening the relationship between remittances and income inequality in receiving economies. When political stability declines, resources that could be allocated to pro-poor projects and social development initiatives aimed at reducing income inequality are often redirected toward security spending (Majeed and Mushitaq, 2019; Siddique and Majeed, 2019). Disruptions caused by strikes and violence can also hinder access to quality education, hinder individuals' chances of upward mobility, and perpetuate income inequality (Devi, 2017). Furthermore, the absence of political stability leads to increased uncertainty, which hampers businesses and reduces investments. This can further exacerbate income inequality as job opportunities and income sources become scarce (Gyimah-Brempong and Muñoz De Camacho, 1998; Elorabi *et al.*, 2024; Maher and Zhao, 2022).

Despite the MENA region experiencing a significant increase in remittance inflows, it has become the most unequal region globally, with income inequality continuing to rise. One possible explanation for this difference is the presence of political instability in the area, which tends to divert remittance funds away from investments in human and physical capital, thus negatively impacting the income distribution in receiving countries. Additionally, this may be because most families that receive remittances in the first place are well off, which means that remittances contribute to increasing income inequality between individuals. This study, therefore, aims to examine the moderating effect of political stability on strengthening the relationship between remittances and income inequality in the MENA region.

This paper contributes to the existing body of literature in several ways. First, the empirical results on the influence of remittances on income inequality in labor-exporting countries are

conflicting, and previous studies have focused primarily on individual economies. However, this study takes a broader perspective by examining the link between remittances and income inequality in the MENA region, which has not yet been investigated. Second, previous studies have investigated the relationships between remittance inflows, political stability, and income inequality separately. This paper thus differs because it examines the interaction effect between remittances and political stability on income inequality in receiving countries to determine whether political stability has a meaningful indirect impact on this relationship. Another significant contribution of this paper is the use of political stability as an aspect of institutional quality in the MENA region rather than considering other dimensions, such as the control of corruption, the rule of law, or government effectiveness. This is because political stability has been the most deteriorating indicator in recent years in the MENA region. Additionally, it is the most crucial index among the other institutional indicators that has most clearly affected economic performance in the MENA region; in addition, it is the most relevant to the study's main variables.

The rest of the paper is organized into five sections. [Section 2](#) of the study examines the relevant literature, while [Section 3](#) outlines the methodology and data employed in this paper. [Section 4](#) presents the empirical findings and their interpretations. The concluding section summarizes the key points and offers policy suggestions and research limitations.

2. Review of the literature

Our empirical analysis is based on the theoretical framework provided by the literature on migration, remittances, and inequality. [Docquier and Rapoport \(2003\)](#) and [Shen et al. \(2010\)](#) developed a model that categorizes households into two types based on their productivity levels. Low-productivity households face greater constraints in terms of liquidity and assets, while high-productivity households experience the opposite. According to consumer theory, families aim to maximize their utility conditional on their budget constraints. Migrant remittances increase the available budget for families, improving their standard of living and helping them reach a higher level of stability. Therefore, the impact of inward remittances on income inequality in receiving economies depends on the characteristics of the recipient families. If the majority of remittance recipients come from low-income families, the income gap among individuals is likely to decrease. However, if most recipients are not poor, then remittances may widen income inequality in society.

The effect of remittances on income distribution inequality remains a subject of ongoing debate in the empirical literature without a clear consensus. For instance, [Tung and Thang \(2023\)](#) investigated the influence of migrant remittances on the inequality of income distribution in eighteen emerging countries from 1985 to 2019. The findings of this research confirmed that migrant remittances play a significant role in reducing income inequality, indicating that as the magnitude of remittances received increases, the level of income inequality in these countries decreases. Similarly, [Azizi \(2021\)](#) examined how remittances from migrant workers to their home countries affected poverty levels and income inequality in 103 developing nations between 1990 and 2014. The results of the study demonstrated that the inflow of remittances has a positive impact on reducing income inequality and alleviating poverty in developing economies. Additionally, [Bajra \(2021\)](#) examined the effect of remittances on economic growth and income inequality for 6 Western Balkan countries, and found that migrant remittances decrease the inequality of income distribution. Likewise, [Anwar et al. \(2024\)](#) used sophisticated meta-analysis approaches to investigate the connection between remittances and inequality in recipient nations. Overall, the results show that remittances have a negative but negligible economic impact on inequality. There are notable regional differences, too, with remittances significantly reducing inequality in East Asia, Eastern Europe, and Latin America while increasing inequality in South Asia. There is just a slight economic impact in MENA, and Sub-Saharan Africa.

[Bkwayep and Tsafack \(2020\)](#) conducted a study on 47 countries from 2004 to 2014 to examine the relationships between remittances, financial inclusion, and income inequality. Using the generalized method of moments (GMM) method, their findings indicated that increased remittance inflows were linked to decreased income inequality. In addition, [Borja and Hall \(2018\)](#) explored the associations among migrant remittances, the quality of institutions, and the inequality of income in 79 countries from 1990 to 2010. Employing the 2SLS technique, they observed that remittance-receiving countries with better institutional quality experienced more significant reductions in income inequality. Additionally, [Tsauroi \(2018\)](#) analyzed the interaction between remittances, human capital development, and income inequality in twelve emerging markets between 2004 and 2014 using fixed effects, pooled OLS, and random effects. The results demonstrated that increased remittances and improvements in human capital were associated with a reduction in income inequality.

In the same vein, [Akobeng \(2016\)](#) conducted a study on 41 Sub-Saharan African countries from 1981 to 2010 using the GMM estimator. The study focused on the impact of remittances on inequality and poverty in the region. The findings indicated that remittance inflows were associated with declining income inequality in Sub-Saharan Africa. Additionally, [Anyanwu \(2016\)](#) identified the inflow of remittances as one of the major factors contributing to the reduction of income inequality in those economies. Additionally, [Kimhi \(2010\)](#) conducted research in the Dominican Republic to measure the effects of remittances on income distribution. The study's findings indicated that remittances significantly diminished income inequality, primarily attributed to their positive influence on education.

On the other hand, [John \(2017\)](#) conducted a study in India using fixed effect, random effect, and pooled OLS methods to analyze the impact of migration on income inequality. The study revealed that migration and remittances played a noteworthy role in contributing to income inequality among nonmigrant and migrant households, as well as among different households. Moreover, [Mollers and Meyer \(2014\)](#) assessed the influence of migration and remittances on the inequality of income and poverty in rural Kosovo and found that the inflow of remittances increased income inequality in the region. Another study conducted by [Howell \(2017\)](#) focused on the influence of remittances from migrants on the disparity of income in rural minority regions of China using household data. The findings revealed that while remittances contributed to increased income among ethnic groups in rural China, they also led to greater income inequality between these ethnic groups. Additionally, [Miftah and Bouoiyour \(2014\)](#) utilized the probit model to investigate the impact of remittances on poverty and income inequality in rural areas of Morocco. The study demonstrated that remittance inflows were associated with increased income inequality in those regions.

In the context of nonlinearities, [Akçay \(2022\)](#) investigates how international remittances effect income inequality in the Philippines, a country that relies heavily on out-migration and remittances. This study demonstrated that the inequality-remittances relationship is inverse U-shaped, implying that remittances have an income-equalizing effect only after a certain threshold level (estimated at 10.53%), supporting the existence of a remittance Kuznets Curve.

According to the literature, remittances positively impact income inequality and alleviate poverty in receiving economies depending on how the funds are utilized by the poor. Studies suggest that when remittances are invested in human capital development, including areas such as housing, nutrition, healthcare, and education, they have the potential to reduce income inequality among individuals ([Kimhi, 2010](#); [Olowa and Shittu, 2012](#); [Tsauroi, 2018](#); [Waheed and Shittu, 2012](#)). Similarly, [Moustapha \(2024\)](#) investigated the influence of foreign remittances on domestic financial transfers in Senegal through instrumental variable analysis, utilizing a substantial sample of adults aged 13 and older. The results indicate a direct internal dissemination effect of international remittances. Recipients of such remittances are 26% more inclined to conduct internal monetary transfers, with affluent recipients exhibiting a greater tendency. The most impoverished persons derive the greatest advantage. In the presence of international remittances and internal cash transfers, the Gini index is reduced by 3% points compared to scenarios lacking international remittances, and by 9.2% points relative to

scenarios with international remittances absent internal sharing, highlighting their redistributive characteristics. These findings are consistent across recipient regions and diverse econometric methodologies. However, the effectiveness of remittances in reducing income inequality can be hindered by poor institutional quality. Political instability diverts resources away from pro-poor projects and programmes, such as the construction of schools, universities, hospitals, etc., toward increased security spending due to resource scarcity. Moreover, in times of political instability, there is a tendency to invest less in education, which is one of the sectors most affected by such circumstances (Majeed and Mushitaq, 2019; Siddique and Majeed, 2019).

This study explicitly discusses how political instability can undermine the redistributive potential of remittances by disrupting education systems, reallocating public expenditure to security-related areas, and deterring long-term investments—all of which can perpetuate or exacerbate income inequality. These mechanisms are supported by empirical studies (e.g. Majeed and Mushitaq, 2019; Siddique and Majeed, 2019; Devi, 2017). We developed a hypothesis statement as follows: “political stability significantly moderates the relationship between remittance inflows and income inequality in MENA countries”. This hypothesis is directly informed by the preceding literature and provides a clear basis for the empirical investigation that follows in the methodology section.

Overall, by encompassing dynamic and region-specific evidence into preexisting theoretical frameworks, this study advances the fields of remittance economics and the political economy of inequality. The study supports and improves early models (like those conducted by Stark *et al.* (1986, 1988)) that suggest remittances can worsen inequality by benefitting only specific households before eventually having an equalizing effect as migration networks grow by providing empirical evidence of the association between remittances and income inequality. Furthermore, the study emphasizes how political instability affects the relationship between remittances and economic inequality by concentrating on the MENA region. This study connects the literature on human capital development (as covered in current UN frameworks) with the political ramifications of income distribution, while also expanding our knowledge of the ways in which remittances inflows influence domestic political issues. By doing this, it contributes to the theoretical discussion of migration, remittances, and their wider economic and political effects by offering a more nuanced viewpoint on how international remittance flows influence social stratification and political stability. As can be seen from the literature review, no special focus has been paid to the relationship between international remittances and income inequality, taking into account political stability in the MENA region (El-Chaarani and Lombardi, 2022; El-Chaarani *et al.*, 2022; El-Chaarani *et al.*, 2023a; EL-Chaarani *et al.*, 2023b). Accordingly, our recent study tries to bridge this gap in the literature to get outcomes and insights to be generalized in the remittances-receiving countries.

3. Methodology

3.1 Econometric model

To test the role of political stability in the nexus between remittance inflows and income inequality, this study adopts a model inspired by the research of Tsaurai (2018), among others. The initial model, referred to as the baseline model, can be formulated as follows:

$$INEQ_{it} = \beta_0 + \beta_1 INEQ_{it-1} + \beta_2 REM_{it} + \beta_3 PS_{it} + \beta_4 X_{it} + \mu_{it}, \quad (1)$$

where *INEQ* denotes income inequality, *REM* is remittance inflows, *PS* symbolizes political stability, and *X* is a vector of control variables (such as economic growth, trade openness, and education) that affect income inequality. Additionally, the subscripts *i* and *t* denote country and time, respectively, and μ is the error term.

To examine the hypothesis that political stability plays a crucial role in moderating the impact of remittances on income inequality, Eq. (1) is expanded upon to incorporate an interaction term created by multiplying remittance inflows by political stability (i.e. $REM \times PS$). By incorporating this extension, the model can be represented as follows:

$$INEQ_{it} = \beta_0 + \beta_1 INEQ_{it-1} + \beta_2 REM_{it} + \beta_3 PS_{it} + \beta_4 (REM \times PS)_{it} + \beta_5 X_{it} + \mu_{it}. \quad (2)$$

In this framework, β_3 is used to test the moderating influence of political stability on the association between remittance inflows and income inequality in receiving economies. A positive and significant coefficient indicates that the interaction term increases income inequality. However, if otherwise negative and significant, this implies that the interaction term decreases income inequality in the MENA region. Then, the marginal impact of remittances on income inequality through the role of political stability is as follows:

$$\frac{\delta INEQ}{\delta REM} = \beta_2 + \beta_4 * PS_{it}. \quad (3)$$

3.2 Econometric method

This study utilizes three econometric techniques: the pooled mean group (PMG), the mean group (MG), and the dynamic fixed effect (DFE) methods developed by [Pesaran and Smith \(1995\)](#) and [Pesaran et al. \(1999\)](#). In these techniques, the number of time periods (T) must always be larger than the number of countries (N), or both T and N should be noticeably large (i.e. greater than 20).

The PMG estimator was employed, which allows for a specific econometric specification by assuming common long-term effects while incorporating data-driven short-term dynamics for each country in the panel ([Jehangir et al., 2020](#)). The PMG method yielded dependable results by allowing for heterogeneous dynamics in the short term while assuming homogeneity in the long-term coefficients. In contrast, the MG method considers all slope coefficients to be heterogeneous. Unlike the MG method, the PMG technique assumes that certain parameters are identical across countries ([Chebab et al., 2022](#)). Furthermore, the PMG technique addresses the issue of heterogeneity bias commonly encountered when employing the DFE technique. Finally, the PMG method has demonstrated efficiency even when working with a small sample size, as the standard *t*- and *F*-tests remain valid for the long-run parameters derived from error correction models ([Pesaran et al., 1999](#)).

3.3 Data

For this study, eleven countries [2] were chosen from the MENA region based on countries relevant to remittance inflows and available data. It focuses only on the relationship between international remittances and income inequality in remittance-receiving countries (like Syria and Libya) that suffer from severe political instability and geopolitical discrepancies, excluding remittance-sending countries (like the UAE and Qatar) from the analysis. The reasons behind such exclusion could be clarified as follows. Remittances directly increase household income in receiving countries, influencing consumption, investment, and poverty rates. This direct inflow may alter income distribution in certain countries. In sending countries, remittances are inflows of income earned overseas that have no direct impact on local income distribution. The wages of migrants abroad do not contribute to the sending country's economy, making the relationship to inequality less obvious. Moreover, remittances often account for a significant portion of GDP in receiving nations, such as Egypt, increasing their impact on macroeconomics and distribution. Remittance outflows in sending countries (generally wealthier nations) are often a smaller fraction of GDP, making their economic and inequality effects less evident. Furthermore, remittances can either decrease or increase inequality in receiving countries, depending on whether they target poorer or wealthier

households. In sending nations, inequality dynamics may result from labor-market movements (e.g. brain drain, wage changes caused by emigration), which are distinct from remittance flows and necessitate independent research. Finally, income inequality measurements in sending nations often exclude migrants’ overseas earnings because they are not considered domestic income. Thus, remittance outflows are not explicitly accounted for inequality calculations.

In this paper, we use annual data for the period 1996–2022, which broadly covers an extended period of the MENA region’s economic and political environment. Such a period covers the pre- and post-Arab Spring dynamics (between 2010–2011), political instability in Libya (post-2011), Syria’s civil war (which starts in 2011 up to present), and the Egyptian deal with the International Monetary Fund (IMF) to make economic reforms. All these factors reshaped how political instability and economic transitions impact remittance-inequality associations.

To strengthen the reliability of the regression results, this study employs multiple measures of income inequality. One of the measures used is the Gini index, which measures the extent to which the income distribution between people within a country deviates from a perfectly equal distribution. It is scaled between 0 and 1, where 0 is perfect income equality, while 1 expresses maximum income inequality among values. The second measure uses the income share of the top 1% (percentile 99–100%), while the third one uses the income share of the top 10% (percentile 90–100%). The three income inequality measures are taken from the World Inequality Database (WID).

This study also uses remittances as a percentage of GDP to measure remittance inflows and the political stability and absence of violence/terrorism indices to measure political stability. The data on remittance inflows and political stability are gathered from the World Development Indicators (WDI) and Worldwide Governance Indicators (WGI) databases, which are all World Bank databases. Following the empirical growth literature (Ajeeb *et al.*, 2023; Akobeng, 2016; Borja and Hall, 2018; Koechlin and León, 2007; Mallick *et al.*, 2020; Tsaurai, 2018; Waheed and Shittu, 2012), this paper also incorporates other control variables, such as the annual percentage growth rate of GDP (as an indicator of economic growth), trade as a percentage of GDP (as a measure of trade openness), and percentage of gross primary school enrollment (as a measure of education). The control variables utilized in this analysis are obtained from the WDI. Table 1 describes the variables used in our analysis.

4. Empirical results and discussion

4.1 Descriptive statistics and correlation analysis

Table 2 presents descriptive statistics of the dependent and explanatory variables, providing an overview of the dataset used in this study. This table includes information such as the number

Table 1. Description of the data

Variable	Unit of measurement	Data source
INEQ	Gini Coefficient (0–100)	WID
REM	Received remittances as a percentage of GDP	WDI
PS	Political stability index (scores between –2.5 and + 2.5)	WGI
GDPGR	The growth rate of real GDP (annual %)	WDI
TR	Trade (% of GDP)	WDI
EDU	Percentage of gross primary school enrollment	WDI
Note(s): INEQ = Income inequality, REM = Remittance inflows, PS = Political stability, GDPGR = Growth rate of real GDP, TR = Trade openness, and EDU = Percentage of gross primary school enrollment		
Source(s): Authors’ own work		

Table 2. Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
INEQ	297	59.4062	4.308912	48.8	66.79
REM	297	4.82429	5.951139	0.06	26.02
PS	297	-1.03327	0.76303	-2.97	0.32
GDPGR	297	3.3520	4.979605	-26.34	21.93
TR	297	64.1059	26.14036	0.78	146.91
EDU	297	98.1230	16.05901	37.6	128.46

Note(s): Obs. = Observations, Std. Dev. = Standard deviation, Min = Minimum values, and Max = Maximum values of the variables. All the variables are not in logarithmic form

Source(s): Authors' own work

of observations, the mean, the standard deviation, and the maximum and minimum values for each variable.

The correlation coefficients among the explanatory variables are presented in [Table 3](#). Correlation analysis is a method used to assess the presence of multicollinearity among regressors. The correlation matrix revealed that the correlation coefficient between any two explanatory variables was less than 0.80, indicating the absence of significant multicollinearity.

4.2 Panel unit root tests

An advantage of utilizing the PMG, MG, and DFE techniques is that the variables involved are stationary at the level or the first difference or a mixture of both but not of order $I(2)$ ([Pesaran et al., 1999](#)). [Table 4](#) presents the results of the panel unit root tests, including the Levin, Lin, and Chu (LLC), Im, Pesaran, and Shin (IPS), Augmented Dickey-Fuller (ADF), and Phillips-Perron (PP) tests. The significance of the test statistics indicates a combination of different orders of integration among the variables. Specifically, some variables exhibit stationarity at the $I(0)$ level, while others show stationarity at the first difference $I(1)$.

4.3 Panel Cointegration test

Before the cointegration test, we select the optimal lag length based on the Schwarz Bayesian information criterion (SBIC), which is ARDL (2,1,1,1,1,1). In addition, the Kao panel cointegration test between income inequality and its regressors also indicates a cointegration relationship between the variables, as shown in [Table 5](#). The test explores the presence of a long-term association between the inequality of income distribution and its explanatory variables.

Table 3. Correlation matrix

Correlation	INEQ	REM	PS	GDPGR	TR	EDU
INEQ	1.0000					
REM	0.1057	1.0000				
PS	0.0470	0.1412	1.0000			
GDPGR	0.0122	0.0677	0.2450	1.0000		
TR	0.1012	0.5946	0.4904	0.1324	1.0000	
EDU	-0.0501	-0.1452	0.5128	0.0383	0.2715	1.0000

Source(s): Authors' own work

Table 4. Panel unit root tests

Variable	Statistics	Level, $I(0)$		1st difference, $I(1)$	
		Constant	Constant and trend	Constant	Constant and trend
INEQ	LLC t	−3.55423***	−1.53778*	−3.26761***	−3.26509***
	IPS W-stat	−2.40019***	−0.03722	−4.22234***	−3.47947***
	ADF- Fisher	39.3955**	29.6563	61.9304***	54.1439***
	PP - Fisher	26.9729	9.30084	60.6492***	45.6868***
REM	LLC t	−0.81018	−0.82661	−10.2853***	−7.65473***
	IPS W-stat	0.26684	−1.18508	−10.3840***	−8.57720***
	ADF- Fisher	16.3545	29.0039	134.527***	103.261***
	PP - Fisher	16.7085	21.5845	158.786***	142.413***
PS	LLC t	−1.33002*	−0.42898	−10.2193***	−5.09818***
	IPS W-stat	−0.32610	−1.58127**	−10.8310***	−6.72579***
	ADF- Fisher	19.3637	29.5504	139.601***	87.5407***
	PP - Fisher	14.7973	18.1161	145.856***	214.155***
GDPGR	LLC t	−4.03262***	−3.63642***	−16.8064***	−14.3718***
	IPS W-stat	−6.13938***	−6.33198***	−16.7412***	−15.0893***
	ADF- Fisher	85.5309***	80.3753***	220.330***	222.500***
	PP- Fisher	75.8171***	67.7962***	317.330***	860.338***
TR	LLC t	0.07518	−1.22603	−12.5059***	−11.5830***
	IPS W-stat	0.74885	0.30116	−11.0461***	−9.63227***
	ADF- Fisher	14.4568	26.0431	141.717***	113.384***
	PP - Fisher	14.9110	13.5307	139.791***	154.454***
EDU	LLC t	−1.85256**	−3.31014***	−5.40595***	−4.05636***
	IPS W-stat	1.04779	−2.30510**	−6.07829***	−4.52387***
	ADF- Fisher	26.9619	46.4661***	84.3952***	63.6884***
	PP - Fisher	20.5193	15.8119	101.106***	80.4452***

Note(s): ***, **, and * signify significance at the one percent, five percent, and ten percent levels, respectively. Automatic selection of lag length based on the Schwarz Bayesian information criterion (SBIC). The *t*-statistic values are reported, and nonstationarity is the null hypothesis

Source(s): Authors' own work

Table 5. Results of the Kao Cointegration test

Test	<i>t</i> -Statistic	Prob.
Kao Residual Cointegration Test	−2.521125	0.0058

Note(s): The null hypothesis is no cointegration. Automatic lag length selection is based on the SIC with a maximum lag of 5

Source(s): Authors' own work

4.4 Panel regression analysis results and discussion

The PMG, MG, and DFE techniques were used to estimate the outcomes. After the Hausman test was applied, the PMG method was found to be more appropriate than the MG and DFE methods. Table 6 only displays the results of the PMG estimator due to space constraints [3]. The findings from Model 1 indicate that remittance inflows do not directly impact income inequality in the MENA region unless they interact with political stability. This result aligns with those of previous empirical studies, such as Beyene (2014) and Garip (2014). The coefficient on political stability has a significant negative effect on income inequality at the 1% level. Several studies have provided evidence that political stability can reduce income inequality among individuals (Josifidis *et al.*, 2017; Kemp-Benedict, 2011; Nikoloski, 2009; Siddique and Majeed, 2019). When political stability declines, a significant portion of the

Table 6. Empirical results of the PMG estimates

	Gini coefficient (%) Model 1	Model 2	Income share of the top 1% Model 3	Model 4	Income share of the top 10% Model 5	Model 6
<i>Estimated long-run equation</i>						
REM	0.1653068 (0.1206589)	1.565668*** (0.3765043)	−0.0606058 (0.1549483)	1.303837*** (0.2870874)	2.542315*** (0.3238535)	2.615161*** (0.4997861)
PS	−2.082272*** (0.6110475)	−3.763217*** (0.5462735)	−0.7900268 (0.6379884)	−2.233037*** (0.4135787)	−2.427291*** (0.4501106)	−2.873352*** (0.499758)
GDPGR	−0.2102172*** (0.0707333)	−0.188708*** (0.0494942)	−0.229800*** (0.084743)	−0.1717099*** (0.0488435)	−0.0731737 (0.0453857)	−0.151463*** (0.0510826)
TR	0.051274*** (0.0191343)	0.0420775** (0.0163895)	0.092214*** (0.0241394)	−0.0097143 (0.0102996)	0.0803029*** (0.0147164)	0.083854*** (0.0151969)
EDU	0.0798808** (0.031583)	−0.0318781 (0.0355658)	0.204149*** (0.056029)	0.049636*** (0.0182359)	0.189707*** (0.0477861)	0.145540*** (0.043233)
REM*PS	− (0.0348973)	−0.864560*** (0.1820201)	−	−0.777837*** (0.1417194)	−	−1.236169*** (0.2240891)
ECT	−0.092622*** (0.0348973)	−0.1052154** (0.0419969)	−0.1096691*** (0.0406978)	−0.131130*** (0.0533303)	−0.0946797* (0.0570645)	−0.1073002** (0.0524659)
<i>Estimated short-run equation</i>						
Constant	4.347814*** (1.674077)	5.826023** (2.41927)	−0.8035995*** (0.2780994)	1.3456530** (0.6445187)	2.09437 (1.314645)	2.789103** (1.420618)
Δ INEQ (−1)	0.463970*** (0.1050466)	0.464982*** (0.1372128)	0.3815105*** (0.1181688)	0.416641*** (0.1601101)	0.574712*** (0.0949013)	0.627405*** (0.1571482)
Δ REM	−0.1042798 (0.2440937)	−0.6430828 (0.4169346)	−0.1600581 (0.2313795)	−0.7359171 (0.5922931)	−0.3788761 (0.3098831)	−0.9416868 (0.9324909)
Δ PS	0.0119077 (0.128206)	0.2537652 (0.7203974)	0.1157604 (0.1889983)	0.8808714 (1.250286)	0.0545162 (0.1850163)	0.3321565 (1.1399)
Δ GDPGR	−0.0055973 (0.007372)	−0.0124804 (0.0125533)	−0.0030837 (0.0104968)	−0.0153848 (0.0163945)	−0.004549 (0.0062534)	−0.0215801 (0.0155844)
Δ TR	0.0142584** (0.0073096)	0.014912** (0.0075936)	0.0021866 (0.0073113)	0.0097679 (0.007379)	0.0089646 (0.0081892)	0.0084045 (0.0080773)

(continued)

Table 6. Continued

	Gini coefficient (%)		Income share of the top 1%		Income share of the top 10%	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Δ EDU	−0.029272 (0.0256787)	−0.0132279 (0.0223668)	−0.0270887 (0.0260309)	−0.0195363 (0.0184818)	−0.0301672 (0.0275325)	−0.0123247 (0.023024)
Δ REM*PS	–	−0.4536944 (0.4773003)	–	−0.5041986 (0.5046928)	–	−0.4206739 (0.625353)
Countries	11	11	11	11	11	11
Observations	275	275	275	275	275	275
Log-Likelihood	92.6701	121.236	46.679	70.463	95.304	121.037
<i>Marginal effects when political stability (PS) is at</i>						
Minimum	–	−1.002076*** (0.2122393)	–	−1.00634*** (0.1679778)	–	−1.056261*** (0.2751727)
Mean	–	0.672341*** (0.2044712)	–	0.500119*** (0.1528714)	–	1.337861*** (0.2978884)
Maximum	–	1.842327*** (0.4324998)	–	1.552745*** (0.3307628)	–	3.010735*** (0.5669286)
Note(s): ***, **, and * signify significance at the one percent, five percent, and ten percent levels, respectively. REM*PS is the interaction variable between remittance inflows and political stability. The values in brackets denote standard errors						
Source(s): Authors' own work						

resources required for implementing projects aimed at reducing income inequality are redirected toward security expenditures. Furthermore, periods of strikes and violence disrupt educational institutions, resulting in limited access to quality education. As a consequence, individuals' opportunities for upward mobility are constrained, which perpetuates income inequality. Additionally, the presence of uncertainty hampers business activities and discourages investments. This exacerbates income inequality as job opportunities and income sources become scarce (Borja and Hall, 2018; Chong and Gradstein, 2007; Shams and Kadow, 2020; Tsaurai, 2018).

The outcomes from Model 2 reveal that migrant remittances have a positive and statistically significant impact on income inequality in the long run. Specifically, a 1% increase in inward remittances leads to a 1.57% increase in income inequality in receiving economies. This suggests that individuals who receive remittances are generally not poor in the first place, and when they receive remittances, their spending and standard of living improve more than others. Consequently, the receipt of remittances contributes to an increase in income inequality. Remittances' beneficial effect on income inequality can be attributed to a number of theoretical mechanisms: (1) Selective Migration: People from comparatively affluent households are more likely to relocate because migration frequently entails significant upfront costs. Selection bias has the potential to exacerbate inequality by concentrating remittances among families who are already well-off. (2) Network Effects: By encouraging more movement from the same socioeconomic groups, migration networks have the potential to reinforce and magnify early inequities as they grow. (3) Skill Premium: Over time, remittances may increase as a result of immigrants' frequent acquisition of new skills abroad. The disparity between households that receive remittances and those that do not may grow as a result of this skill premium. (4) Investment in Human Capital: Households that receive remittances may make larger long-term investments in health and education, which could result in the transfer of advantages between generations and increased inequality. These findings are consistent with previous empirical studies conducted by Adams *et al.* (2008), Anyanwu (2011), Howell (2017), John (2017), Miftah and Bouoiyour (2014), and Mollers and Meyer (2014), but contradict the findings of Koczan and Loyola (2021), who found a negative association between remittances and income inequality in Mexico. They also contradict the results of Letsoalo and Ncanywa (2021), who found the same inverse association in the Southern African Development Community (SADC) region.

Remittances can intensify income inequality via numerous interconnected mechanisms. The substantial initial costs of migration result in early migrants predominantly originating from more affluent households—only individuals with adequate resources can bear these expenses—creating a “selection effect” that channels remittances mainly to those who are already economically advantaged, thus exacerbating existing inequalities. Secondly, as remittances are frequently allocated for immediate consumption instead of long-term investments in education or productive assets, they elevate living standards in the short term without substantially augmenting future income-generating potential, so exacerbating inequality. Third, when households receive remittances, there may be a diminished motivation to participate in the local labor market, which can depress pay levels and reduce income opportunities for non-recipient households. Furthermore, the influx of remittances from overseas may result in elevated domestic prices—particularly for housing and essential goods—complicating access for low-income households, and potentially causing macroeconomic distortions (such as a Dutch disease-like appreciation of the local currency) that adversely affect competitive sectors of the economy. Collectively, these routes demonstrate that remittance flows, although beneficial for short-term poverty alleviation, can paradoxically exacerbate income inequality by favoring the already affluent and distorting economic incentives and domestic markets (Anwar *et al.*, 2024; Adams *et al.*, 2008).

Again, the political stability coefficient negatively affects income inequality for MENA countries at the 1% significance level. Similarly, the findings reveal a significant negative relationship between real GDP growth and income inequality in MENA countries.

Specifically, a 1% increase in economic growth is associated with a 0.19% decrease in income inequality. Economic growth is crucial for reducing income inequality by creating employment opportunities and increasing people's income, thus improving their well-being. Additionally, employment growth helps alleviate unemployment, income inequality, and poverty (Barro, 2000; Elorabi *et al.*, 2024). This inverse relationship between economic growth and income inequality confirms the Kuznets hypothesis of Kuznets (1955) and aligns with the findings of previous studies (Akobeng, 2016; Borja and Hall, 2018; Mallick *et al.*, 2020; Tsaurai, 2018).

In addition, the study reveals that the interaction effect between political stability and remittance inflows has a positive association with income inequality in MENA countries at the 1% significance level. This implies that inflows of remittances may increase income inequality when the polity becomes less stable in MENA. This can be attributed to higher- and middle-income families benefiting more from remittances than poorer families. When political stability diminishes, these families allocate remittance money to enhancing their living standards, including housing, healthcare, education, savings, and business investments. As a result, their income levels increase and contribute to a higher steady state, exacerbating income inequality.

This study further examines the impact of political stability on income inequality across different levels, highlighting the significance of the interaction variable in understanding the results. The marginal effects of political stability and remittances received at the lowest, average, and highest levels are significant at the 1% level, as shown in Model 2. This result suggests that as political stability improves in the MENA region, the effect of remittances on the inequality of income in labor-exporting nations becomes more pronounced.

To confirm the reliability of our results, we conducted additional analyses by re-estimating the model using alternative measures of income inequality: the income share of the top 1% and the income share of the top 10%. As presented in Table 6, the results of Models 4 and 6 revealed that the interaction term of political stability and migrant remittances is significant at the 1% level in terms of the increasing income gap among individuals, signifying that a one-unit increase in the interaction between the rising income share of the top 1% and the income share of the top 10% by 0.78 and 1.24%, respectively, in MENA. Additionally, Table 6 displays the marginal effects of Models 4 and 6 across different levels of political stability, ranging from minimum to medium to maximum. The marginal effects confirmed that the interaction term is significant at the 1% level in increasing the income gap among individuals at the medium and maximum levels. These results, therefore, signify that when political stability improves, the impact of remittances on the rising inequality of income in recipient nations grows. Hence, these findings assert that political stability is crucial in the relationship between remittances received and income inequality in the MENA region.

Finally, the trade openness coefficient positively and significantly affects income inequality at the 5% level in the short and long run. When trade between MENA countries and other regions opens up, income inequality tends to increase. This is because trade openness promotes the growth of the export and import sectors, creating more jobs. However, this also leads to a skill-biased technical change, where low-skilled workers experience job losses while skilled workers benefit, thus perpetuating income inequality (Balassa, 1978; Winters *et al.*, 2004). These findings align with previous studies by Galiani and Sanguinetti (2003), Meschi and Vivarelli (2007), and Tsaurai (2018), which revealed that trade openness increased income inequality.

The study also revealed that the relationship between education level and income inequality in MENA countries was negative but not statistically significant, especially in the short run. The negative sign indicates that human capital development through education can reduce income inequality by increasing both innovation and the demand for skilled workers who can incorporate new technologies into production processes. Integrating more skilled workers into the labor force contributes to a decrease in income inequality. Additionally, the increased availability of human capital leads to a decline in relative wages and income inequality.

(Koechlin and León, 2007; Mallick *et al.*, 2020; Tsaurai, 2018; Waheed and Shittu, 2012). This takes much more time. That is why the relationship between education level and income inequality becomes significant in the long run.

Lastly, regarding cross-regional comparison, Acosta *et al.* (2009) discovered that remittances in Latin America and the Caribbean follow a strikingly distinct pattern. While the MENA remittance coefficient is approximately equal to 1.57, Latin American nations typically have coefficients between 0.7 and 0.8. This estimated coefficient in East Asia and the Pacific (especially in the Philippines) reaches 0.03 approximately, based on the estimates of Akçay (2022). This significant discrepancy shows that remittances are more important in MENA's economic development. This could be explained using the idea of "remittance dependency," which describes how MENA economies have strengthened institutional frameworks for exploiting remittance inflows.

4.5 Robustness analysis

For robustness and checking for the existence of endogeneity, the Dumitrescu and Hurlin's (2012) panel Granger non-causality test has been conducted. Its null hypothesis states that x does not Granger-cause y , while the alternative hypothesis denotes that x Granger-cause y for at least one panel (a country, in our study). The test's performance may vary under conditions of small panels or when individual cross-sections exhibit considerable heterogeneity. To mitigate these issues, we applied the test with appropriate lag selection and verified that our panel (comprising 11 countries and 27 years) meets the minimum threshold conditions recommended for the validity of the test.

The test results are presented in Table 7, revealing the absence of reverse causality. More specifically, we have robust empirical evidence that remittances, political instability, GDP growth, trade openness, and education all cause income inequality, rather than the reverse. Put differently, there is a unidirectional causality from these variables to income inequality.

5. Concluding remarks

In recent decades, the MENA region has faced significant violence and political unrest, leading to a decline in economic indicators such as growth, employment, and income distribution. However, during that time, remittance inflows to the region grew, emerging as a key foreign exchange source for many MENA countries. Hence, using the PMG method, this paper aims to explore how political stability influences the association between remittance inflows and income inequality in selected MENA countries over the study period. Our results

Table 7. Results of the Dumitrescu–Hurlin test of causality

Direction of causality	W-bar stat	Z-bar stat	Z-bar tilde stat
REM → INEQ	7.9853	9.9255***	7.4559***
INEQ → REM	2.414	0.6865	0.2131
PS → INEQ	4.8529	4.7311***	3.3838***
INEQ → PS	2.7079	1.1739	0.5952
GDPGR → INEQ	5.377	5.6001***	4.0650***
INEQ → GDPGR	2.8431	1.3982	0.7711
TR → INEQ	5.1429	5.2119***	3.7608 ***
INEQ → TR	4.4808	0.1140	0.9001
EDU → INEQ	8.2724	10.402***	7.8291***
INEQ → EDU	2.8739	1.4491	0.8110

* **Note(s):** *** signifies significance at the one percent. Two lags have been chosen. INEQ = Income inequality

Source(s): Authors' own work

affirm that the inflow of remittances to the MENA region has a positive and significant impact on income inequality, which implies that with the increase in migrant remittances, the income gap increases among individuals in receiving countries. This means that most households receiving remittances from MENA in the first place are well off, and with the receipt of remittances, they tend to improve their standard of living much more dramatically than other families. Additionally, the findings demonstrated that the interaction term between remittances and political stability has a significant positive correlation with income inequality in recipient countries. This implies that when the level of political stability increases (political instability decreases), the influence of remittances on widening the income gap in recipient countries becomes more significant.

In this context, high-remittance countries, such as Lebanon, Jordan, and Egypt, should direct substantial inflows towards improving the educational system and also towards investment and productive activities. More interestingly, enhancing political stability necessitates the implementation of anti-corruption measures within remittance systems, the establishment of inclusive financial institutions, and the development of participatory frameworks to guarantee equitable distribution. This should be supported by pro-poor investments in education, health, and infrastructure to alleviate negative impacts on income distribution. Inequality mitigation requires the implementation of targeted social safety nets for non-recipient households, the establishment of skill-building programs, and support for remittance-driven small and medium enterprises. Additionally, it is essential to address the barriers encountered by low-income aspirant migrants, including skill gaps, financial constraints, and information asymmetries, particularly in high-unemployment environments. Improving political stability requires transparency, enhanced law enforcement, equal citizenship, and political pluralism. Dynamic monitoring of inequality metrics, political risk indicators, and stakeholder feedback is critical to refine policies, while cross-border collaboration can maximize remittances' developmental potential.

Practically, the study outcomes can assist policymakers in obtaining insights into the effect of remittances on the distribution of income in MENA countries. Moreover, complementary policies, including directing resources toward pro-poor projects, particularly those that improve education, health, and infrastructure, should be designed to alleviate the adverse consequences of remittances on the distribution of income in receiving countries. Additionally, effective programs can be developed to address barriers faced by low-income individuals who aspire to migrate, particularly in countries with high unemployment rates. These programs can address issues such as education and skill deficiencies, information gaps, and financial constraints. Furthermore, it is crucial to prioritize policies and initiatives that improve institutional quality and political stability, which can be achieved through measures promoting transparency, strengthening law enforcement, ensuring equal citizenship, and embracing political pluralism. In the same vein, by developing thorough policies that combine migration management with educational and skill-training initiatives, governments may encourage fair migration opportunities and the development of human capital. For example, governments can lessen irregular migration and guarantee that all social groups gain from better employment opportunities by creating legal migration pathways that are open to both low- and high-skilled individuals. At the same time, specific investments in vocational training, lifelong learning, and subsidized education can give both native workers and prospective migrants the tools they need to contribute successfully to a contemporary economy. Incentives for returning immigrants that promote the transfer of talents and international remittances for developing local economies are examples of equitable policies, as are the facilitation of loop migration programs, which enable migrants to obtain worthwhile international experience while retaining close ties to their home communities. Subsequently, governments may promote brain circulation, prevent brain drain, and build a more diverse labor market that promotes economic growth and social cohesion.

Finally, this paper has some limitations. It primarily concentrates on investigating the impact of political stability and does not give extensive consideration to other variables of

institutional quality, such as corruption or the effectiveness of government in the region. Besides, it focuses only on the period 1996–2022, nonetheless, the MENA region's national security today faces numerous threats due to armed conflicts and tensions among its nations, particularly in Libya and Sudan. In addition, this study investigated only the relationship between remittances, political stability, and income inequality in the MENA region. Therefore, future research should concentrate on other variables of institutional quality, and should focus on the evolution of political stances and their effects on remittance flows and income inequality in the examined economies. Moreover, future research may look at the relationship between remittances, political stability, and income inequality in other world areas to determine whether they lead to similar or different results.

Notes

1. The countries of the MENA region share many common characteristics related to their climate, environment, history, language, and culture. According to the World Bank, this region includes Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, West Bank and Gaza Strip (Palestine), Yemen, and most studies also include Turkey, Somalia, and Sudan (Agir *et al.*, 2011; Mohamed and Sidiropoulos, 2010).
2. These countries are Algeria, Egypt, Iran, Israel, Jordan, Morocco, Palestine, Sudan, Syria, Tunisia, and Turkey. Our analysis excluded some countries like Yemen due to the lack of data post-2014.
3. The authors provide MG and DFE results upon request.

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