Article

How does conflict moderate the impact of remittances on income inequality in Latin American countries?

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Abstract
This study investigates how conflict moderates the relationship between remittances and income inequality in Latin America, an underexplored dimension in the literature. Drawing on a balanced panel dataset of 20 countries from 2001to 2014, the analysis employs a two-step System Generalized Method of Moments (S-GMM) estimator to address endogeneity, persistence, and country-specific heterogeneity. The results indicate that while remittances generally reduce income inequality, their equalising effect is significantly amplified in conflict-affected settings. These findings support the Insurance Hypothesis, highlighting the role of remittances as informal safety nets during periods of instability. Robustness checks using alternative inequality measures reveal that this effect is most pronounced in reducing disparities between the poorest and richest households, with weaker effects among middle-income groups. The paper concludes by calling for conflict-sensitive remittance and migration policies to enhance the redistributive potential of remittances in fragile contexts.

Keywords: Remittances, Income inequality, Conflict, Latin America, System GMM, Migration and development.

1. Introduction

The relationship between remittances and income inequality is a crucial yet underexplored topic in development economics. Remittances represent a significant source of external finance for developing countries, playing a key role in poverty alleviation and economic stability. In Latin America specifically, remittance inflows have reached unprecedented levels, surpassing foreign aid as a primary economic resource (Vacaflores, 2018). As shown in Figure A in the Appendix, average remittances per capita have steadily increased, reaching a historic high in 2023. Figure B in the Appendix further underscores their economic significance, illustrating remittances as a percentage of GDP, peaking initially at nearly 6% in 2007, dipping until 2013, then rising above 7% by 2023. In countries like El Salvador, Honduras, and Guatemala, remittances now constitute over 20% of GDP, demonstrating their central role in regional economies (World Bank, 2025).

Although remittances are widely recognised for their poverty-reducing effects, their impact on income inequality remains contested. The counterfactual of what household incomes would look like in the absence of migration remains unobservable, making it difficult to isolate the actual effects of remittances (World Bank, 2005). Existing literature presents mixed findings, with some studies suggesting that remittances reduce inequality by supporting low-income households, while others argue that they widen disparities by disproportionately benefiting wealthier households with greater access to migration opportunities.

Much of the literature focuses solely on economic migration, but this study highlights conflict as a critical yet underexplored factor in shaping remittance flows and their impact on inequality. Unlike economic migrants, who primarily move in search of better wages and employment opportunities, conflict-induced migrants flee violence, political instability, and organised crime (Lindley, 2008). As a result, their remittance-sending behavior, and its implications for inequality, differ significantly from traditional economic migration models.

Latin America presents a particularly relevant case for studying this issue due to its history of internal conflicts, forced displacement, and persistent inequality. Figure C in the Appendix shows that while income inequality has declined over recent decades, this progress has been uneven, with fluctuations and a notable post-2020 increase. Meanwhile, Figure D in the Appendix, which tracks average conflict intensity in the region, reveals a rising, though volatile, trend in conflict-related deaths per capita, particularly over the last decade. Countries such as Colombia, Venezuela, and El Salvador have experienced prolonged internal conflicts, leading to large-scale migration that alters the volume and distribution of remittances.

Conflict significantly reshapes the distribution and accessibility of remittances, often excluding vulnerable populations. Migration under conflict conditions typically requires considerable financial and social resources, making it inaccessible to the poorest households, who consequently miss out on vital remittance flows (Lindley, 2008). Instead, remittances become concentrated among wealthier and middle-income families, potentially exacerbating inequality. Even when lower-income households receive remittances, their tendency to allocate these funds towards immediate consumption rather than productive investments limits their potential for sustained economic improvement. These nuances complicate the conventional understanding of the relationship between remittances and inequality and necessitate examining conflict as a critical moderating variable.

While Latin America's strong migration networks and proximity to the United States have historically facilitated remittance flows, the intensity of conflict in the region may complicate this inequality-remittances relationship, an aspect that remains underexplored. The capacity for lower-income households to leverage migration networks and receive remittances may partially mitigate inequality; however, the extent to which conflict offsets or exacerbates these dynamics is still unclear.

This research paper addresses a critical gap by explicitly incorporating conflict as a moderating factor in the analysis of remittances and inequality. Using a System Generalized Method of Moments (S-GMM) approach with region-specific panel data, this research investigates how conflict influences the interplay between remittances and income distribution. By integrating conflict into this analytical framework, the study bridges significant gaps in existing literature and provides concrete policy implications. As global remittance flows continue rising amid escalating conflicts, it is increasingly essential to understand how these financial flows can effectively be harnessed to combat inequality and support equitable development, particularly in conflict-prone regions like Latin America where migration and conflict are deeply interconnected.

The remainder of this paper is organized as follows: Section 2 reviews the related literature, Section 3 presents the data, model and methodology, Section 4 reveals the empirical results, Section 5 discusses the policy implications and Section 6 concludes.

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2. Literature Review

2.1. Remittances and inequality

The relationship between remittances and income inequality remains contested in economic research, with empirical findings often contradictory. Some studies highlight remittances' potential to alleviate inequality by improving financial stability and access for lower-income households, while others argue that they exacerbate disparities by disproportionately benefiting wealthier households with greater migration opportunities.

Several studies provide evidence that remittances reduce inequality by redistributing income toward lower-income households. Ahlburg (1996) supports this view, showing that in Tonga, remittance inflows led to a decline in the Gini coefficient from 0.37 to 0.34, indicating a more equitable income distribution. More recently, Vacaflores (2018) used dynamic panel data covering 18 Latin American countries and found that remittances contributed to inequality reduction. Similar findings were documented in other contemporary analysis, like those by Azizi (2021) using data on 103 developing countries, who noted that a 10% increase in per capita remittances result in a 0.3% decline in the Gini coefficients in developing countries.

However, contrasting evidence suggests remittances can widen income gaps. Recent literature highlights that migration opportunities, frequently limited by high initial costs and informational barriers, often remain accessible predominantly to wealthier families. For example, Adams (1991) found that while remittances reduced poverty in Egypt, they simultaneously increased income inequality by favoring middle- and upper-income groups. Similarly, Rodriguez (1998) observed that remittances led to a 7.5% rise in rural income inequality in the Philippines, even though they constituted only a small portion of household income. In Pakistan, survey data revealed that remittance flows disproportionately benefited wealthier income groups, further widening the income gap (Adams, 1998). Barham and Boucher (1998) found comparable results in Nicaragua, where remittances aggravated income inequality by substituting home earnings rather than supplementing them.

A possible explanation for these mixed findings lies in the evolving nature of migration itself. The relationship between remittances and income inequality is dynamic, evolving alongside a country's migration history. An influential framework explaining this evolution is the inverse U-shaped hypothesis, which posits that remittances may initially exacerbate income disparities but eventually contribute to their reduction as migration becomes more widespread and accessible (Stark, Taylor and Yitzhaki, 1986). However, empirical evidence supporting this hypothesis is mixed, with some studies indicating that inequality may persist or even increase in later migration stages.

At the early stages of migration, remittances tend to increase inequality as migration is primarily accessible to higher-income households. Stark, Taylor, and Yitzhaki (1986, 1988) argue that migration at this stage is highly selective due to the significant financial and informational barriers involved, such as transportation costs, settlement expenses, and lack of knowledge about employment opportunities abroad. As a result, only wealthier families can afford to send migrants abroad, allowing them to benefit first from remittances while lower-income households remain excluded. These early remittance flows disproportionately favor wealthier households, reinforcing existing income disparities. Similarly, Lipton (1980) and Stahl (1982) found that remittances were concentrated mainly among better-off families in the initial migration phases, entrenching income inequality.

As migration networks expand over time, the associated costs and barriers decline, enabling broader participation across different income groups. These networks facilitate information sharing, reduce settlement costs, and provide essential support in destination countries, thereby enhancing accessibility for poorer households (Massey, Goldring, & Durand, 1994). This expansion aligns with the inverse U-shaped hypothesis, as increased remittance flows become more evenly distributed among migrant-sending households, ultimately contributing to a decrease in overall inequality (Stark, Taylor, & Yitzhaki, 1986).

Empirical studies reinforce this perspective. Koechlin and Leon (2007), in a cross-sectional study of 78 countries, found that remittances reduced inequality when migration networks lowered the cost of migration and allowed less well-off households to participate. Similarly, in Latin America, Acosta et al. (2008) analyzed macro-level data from 59 countries and attributed the inequality-reducing effects of remittances to strong migration networks and geographic proximity to host countries. Their study indicated that a one percentage point increase in remittances as a share of GDP led to a 0.12 to 1.06 percentage point

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decline in the Gini coefficient, suggesting that remittances can play an equalising role in regions where migration has become more inclusive. McKenzie and Rapoport (2007) provide further evidence, using data from 57 communities across 13 Mexican states, where they observed that as migration networks matured, lower-income households increasingly participated in migration, leading to greater remittance inflows and a reduction in inequality. Further studies (Borja, 2013; Taylor, Rozelle, and de Brauw, 2003; Woodruff and Zenteno, 2007) confirm these findings, emphasising the pivotal role of network strength and declining migration costs in shaping the distributional impacts of remittances. This suggests that in regions with high migration accessibility, remittances can contribute to a more equitable income distribution.

However, in mature migration systems, inequality may either continue to decline or re-emerge, depending on how remittances are distributed. In some contexts, this process leads to the emergence of a "migrant elite," wherein wealthier households with an established migration history continue to benefit disproportionately, while non-migrant families remain excluded (Jones, 1998; Jones, 2008). For example, Jones (1998) found in Zacatecas, Mexico, that remittances exacerbated income inequality at advanced stages of migration, as only households with prior international migration experiences continued to gain. This consolidation of remittance benefits among already advantaged households re-concentrates income and fuels rising inequality. Consequently, the impact of remittances on inequality is not static but evolves across migration stages, helping to explain why inequality may persist or even intensify in regions with mature migration systems. For instance, the recent increase in the average Gini coefficient in Latin America in 2019 may reflect the region's transition into advanced migration phases, although this trend remains underexplored.

These studies suggest that the inequality-reducing potential of remittances is context-dependent. In the early stages of migration, remittances may increase inequality, while at later stages they may reduce it, particularly where strong networks lower barriers to participation. However, in mature migration systems, inequality may again rise if remittance flows become concentrated among a migrant elite.

2.2. Theoretical perspectives on remittances after conflict

The relationship between remittances and income inequality is complex, particularly within conflict-affected contexts. Traditional theoretical frameworks, such as the New Economics of Labor Migration (NELM), posit remittances primarily as mechanisms for income diversification, productive investment, and risk mitigation (Stark & Bloom, 1985; Stark & Taylor, 1989; Taylor, 1999). However, these assumptions are challenged in conflict-affected environments, where remittances often become vital for survival rather than drivers of economic advancement, significantly impacting their distributional outcomes (Lindley, 2008).

Each of the NELM hypotheses offers different expectations for remittance use in conflict settings:

The relative deprivation hypothesis proposes that households migrate to improve their economic standing relative to others in their community (Stark and Taylor, 1989). In theory, households perceiving themselves as economically disadvantaged compared to their peers are more likely to send migrants abroad, hoping that remittances will narrow income gaps and facilitate upward mobility. However, in conflict settings, security concerns rather than economic aspirations typically drive migration (Lindley, 2008). Under these conditions, migrants often depart to escape violence, displacement, or political instability, making remittances less about achieving economic advancement and more about ensuring basic survival. Moreover, while the relative deprivation hypothesis assumes that the most economically disadvantaged households are the most likely to migrate, evidence from conflict-affected areas suggests the opposite. Due to limited resources and social networks, the poorest households often remain in place or in nearby regions, with minimal opportunities to send or receive remittances (Lindley, 2008; Ahmed, 2000; Nyberg-Sørensen, Van Hear, and Engberg-Pedersen, 2002). As a result, remittances tend to accrue to households with sufficient means to finance migration, reinforcing existing inequalities rather than alleviating them. This pattern is illustrated by Fransen and Mazzucato's (2014) study in post-conflict Burundi, where wealthier households disproportionately received remittances, leaving the most vulnerable populations excluded from these financial inflows.

Another dimension of the NELM framework is the investment hypothesis, which suggests that remittances can function as a source of capital for recipient households, enabling them to improve their long-term economic well-being through business financing, human capital development, or other productive investments (Taylor, 1999; Ratha, De and Kim, 2011). If

remittances reach a wide spectrum of lower-income households, they can help reduce disparities by facilitating social mobility. Conversely, when only relatively wealthier households can afford to send migrants abroad, remittances may reinforce existing hierarchies and widen income gaps. In conflict-affected regions, however, the capacity for remittances to serve as investment capital is greatly constrained by ongoing economic instability, weak financial institutions, and persistent political uncertainty (Nyberg-Sørensen, Van Hear, and Engberg-Pedersen, 2002). Under these conditions, households often channel remittances into covering immediate needs, such as food, healthcare, and shelter, rather than productive investments aimed at long-term growth. This trend is illustrated in Somaliland, where only 15% of remittances went toward business or asset investments; the remainder primarily supported essential consumption (Ahmed, 2000). Consequently, remittances in such environments may not lead to upward mobility and instead function as a short-term buffer against hardship. Migration selectivity further accentuates these inequalities. Households with sufficient resources to finance migration are more likely to send family members abroad, while those already at a disadvantage, often the most vulnerable, are unable to participate (Lindley, 2008). This exclusion means remittances tend to bypass the poorest, with funds instead accruing to middle- and higher-income groups already owning property or enjoying stable income streams (Adams, 2011; Mazzucato et al., 2008). The outcome is a remittance system that bolsters the position of relatively wealthier households, reinforcing pre-existing inequalities rather than reducing them.

A third pillar of the NELM framework is the insurance hypothesis, which holds that households utilize migration to safeguard against risks such as food insecurity, unemployment, and economic downturns (Lucas and Stark, 1985). In conflict-affected or post-conflict environments, where formal insurance mechanisms are often weak or nonexistent, this role becomes especially critical. Research consistently shows that, in these contexts, remittances are used primarily for immediate necessities, such as food, housing, and healthcare, rather than for long-term investments (Fagen and Bump, 2006; Nyberg-Sørensen, Van Hear, and Engberg-Pedersen, 2002). Hence, instead of serving as a tool for economic transformation, remittances act as financial insurance that helps households cope with displacement, resource scarcity, and other facets of instability (Horst and Van Hear, 2002; Fagen and Bump, 2006). For instance, Somali refugees in Kenyan camps depend extensively on remittances to meet daily subsistence needs (Horst and Van Hear, 2002), a trend also observed in other post-conflict contexts (Kabki, Mazzucato and Appiah, 2004; Rosenzweig and Stark, 1989). While higher-income remittance-receiving households may gain enough financial flexibility to invest in businesses or property, lower-income non-recipient households often remain excluded. Even among poorer households that do receive remittances, most funds are devoted to essential consumption demands rather than productive investments. Consequently, the selective nature of migration and remittance distribution can exacerbate existing economic disparities, undermining the equalizing potential of remittance flows. In conflict-affected settings, therefore, remittances function chiefly as a buffer against hardship, with limited capacity to foster long-term, broad-based economic development.

2.3. Gaps in the literature

Despite significant research exploring the relationship between remittances and income inequality, critical gaps remain unaddressed, particularly concerning the moderating role of conflict. Existing literature primarily examines remittances' direct effects on inequality, often neglecting the substantial influence conflict exerts on migration dynamics, remittance patterns, and their distributional outcomes. Conflict is typically treated as a peripheral factor rather than a central variable, limiting our understanding of how it fundamentally reshapes migration decisions and remittance impacts. Migrants in conflict contexts prioritize security and immediate survival over economic aspirations, leading to remittance behaviors significantly different from those observed under purely economic migration scenarios (Lindley, 2008). This study addresses this critical gap by explicitly analyzing conflict as a primary moderating variable within the remittance-inequality nexus.

Additionally, despite Latin America being among the largest global recipients of remittances, its specific dynamics within the remittance-inequality-conflict relationship remain notably underexplored. While the region benefits from well-established migration networks and geographic proximity to key remittance-sending countries like the United States-factors often associated with reduced inequality-, existing studies frequently overlook how conflict affects these dynamics. Conflict elevates displacement costs, fosters selective migration, and entrenches structural inequalities, disproportionately excluding vulnerable populations from migration opportunities and remittance inflows. Even when lower-income households receive remittances, these funds predominantly cover immediate consumption needs rather than productive investments, thus limiting their long-term inequality-reducing potential. In advanced migration stages, remittance inflows often become increasingly concentrated among wealthier households, exacerbating inequality rather than alleviating it (Jones, 2021). Hence, it remains

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unclear how effectively established migration networks and proximity mitigate the exacerbating effects of conflict-induced disparities.

Methodologically, this research contributes by employing a GMM framework that addresses endogeneity and captures the dynamic nature of remittance flows. By incorporating interaction terms and lagged variables, this study reflects the temporal evolution of remittances and their interaction with conflict. Drawing on Ambassa et al. (2024) and Bkwayep and Tsafack (2020), the analysis integrates conflict as a key factor to offer a more nuanced understanding of how remittances shape inequality in Latin America.

This paper's theoretical contribution lies in expanding the conventional NELM framework to explicitly incorporate conflict contexts, refining our understanding of migration motives and remittance behaviors under distress. Empirically, it enriches the literature by providing nuanced insights into how conflict fundamentally alters remittance distribution patterns, offering specific evidence from the Latin American context. Conceptually, this research bridges existing theoretical gaps by proposing and validating conflict as a central moderating factor. Ultimately, by addressing these critical theoretical, empirical, and methodological gaps, this study aims to generate actionable policy insights aimed at fostering equitable economic development in Latin America, particularly in regions disproportionately affected by conflict. This is a timely contribution in light of the global rise in conflict-driven migration.

3. Data, model and methodology

This section discusses the methodology, model, and data employed to explore the impact of conflicts on the nexus of remittances-inequality in Latin America, estimating the model parameters using annual data from 2001-2014 for 20 countries.

3.1. Data

The dataset used in this study consists of a balanced panel covering 20 countries over 14 years (2001-2014), yielding a total of 280 observations (N × T = 20 × 14). While data availability constrains the temporal and geographic scope, it ensures consistency across countries and years. Table 1 presents a summary of the dataset, including descriptive statistics and the countries included in the sample.

Variable	Observation	Mean	Std. dev.	Min	Max
Gini pre-tax	280	0.670	0.041	0.527	0.766
Gini post-tax	280	0.633	0.044	0.471	0.750
Top 10 Bottom 50	280	31.846	8.848	12.429	62.904
Top 10 Bottom 10	280	132.760	140.825	24.055	1088.340
Top 20 Bottom 20	280	223.922	120.168	48.585	778.715
Top 30 Bottom 30	280	57.048	20.250	17.692	117.558
Top 40 Bottom 40	280	20.041	5.108	8.168	37.022
Top 20 Middle 20	280	5.834	2.486	1.568	11.951
Remittances	280	4.889	5.680	0.000	21.803
Conflict	280	0.004	0.016	0.000	0.167
Real GDP per Capita	280	6521.544	3958.557	1286.903	17122.040
Inflation	280	7.296	7.526	-7.114	62.200
Government Expenditure	280	12.749	2.974	6.552	19.810
Official Dev. Aid	280	1.651	3.144	-0.624	24.322
Trade Openness	280	67.402	29.139	21.852	164.586
Unemployment	280	7.073	3.592	2.021	19.590
Countries: Argentina, Belize, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemeala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela					

***Table 1**:* Summary statistics and list of countries

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This study's dependent variable is income inequality, in which the primary measure is the Gini coefficient, sourced from the World Income Inequality Database (WIID). The Gini coefficient, based on household surveys, quantifies the extent to which income distribution deviates from perfect equality. A Gini index of 0 represents absolute equality, whereas an index of 100 indicates complete inequality. This study examines pre-tax and post-tax Gini coefficients to explore how redistributive policies influence inequality. However, a well-documented limitation of the Gini coefficient is its inability to capture income disparities at the extremes of the distribution (Zhang and Naceur, 2019). To address this limitation and control the tails of the distribution of inequalities, the analysis incorporates alternative measures of inequality, specifically income share ratios, which compare the income received by lower-income deciles to that of higher income deciles. These supplementary measures allow for a deeper examination of how remittances influence inequality across different income groups, helping to determine whether the observed effects stem from broad-based improvements or disproportionate gains among specific population segments.

Remittances, one of the key independent variables, are measured at the country level using workers' remittance inflows, expressed as a percentage of GDP. The primary measure of remittances is a percentage of GDP, as is standard in the literature (Acosta et al., 2008; Adams and Klobodu, 2017; Akobeng, 2016; Anyanwu, 2011). This measure standardised remittances relative to the size of the economy, facilitating cross-country comparisons and highlighting the extent to which an economy depends on remittance inflows. This remittance-to-GDP ratio is particularly useful for macro-level comparisons.

The second key independent variable is conflict intensity, which is measured using a highly disaggregated, event-level dataset. Following Fang et al. (2020) and Ambassa et al. (2024), conflict is proxied by the number of conflict-related deaths per 1,000 people, calculated as follows:

$$\text{Conflict Intensity} = \frac{\text{Total conflict-related deaths}}{\text{Total population}} \times 1000$$

Data is sourced from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset, which provides the best estimates of fatalities, including those of civilians, combatants, and unknowns. This methodology has been widely adopted in prior studies examining conflict's economic and social consequences (Novta and Pugacheva, 2021). While data consistency is ensured, a notable limitation arises from potential inaccuracies in conflict-related fatalities data. These figures from the UCDP, though widely used, may underreport fatalities due to data collection challenges in conflict zones (Novta & Pugacheva, 2021). Nonetheless, UCDP remains the most comprehensive and reliable source currently available.

A range of control variables is included in this study to account for other key determinants of income inequality. These variables are standard in the literature and represented by matrix X, comprising real gross domestic product (GDP) per capita, inflation, government expenditure, foreign aid, trade openness and unemployment.

Real GDP per capita controls for overall economic development and living standards and is used by several papers within the literature as a control (e.g. Akobeng, 2016; Vacaflores, 2018). Higher income levels are generally associated with lower inequality as they facilitate greater access to education, healthcare, and job opportunities. This follows Kuznets' (1955) hypothesis, which suggests that inequality initially rises with economic development but eventually declines once a country reaches a certain level of prosperity (Ambassa et al., 2024). Inflation affects income distribution by eroding the real value of wages, remittances, and government transfers (Piketty and Saez, 2003). High inflation often disproportionately harms lower-income households, as their earnings and purchasing power decline rapidly, exacerbating inequality (Chauvet et al., 2019; Bjornskov, 2010). Government expenditure is an essential determinant of redistributive policies. Public spending on social programs, education, and healthcare can reduce inequality by enhancing access to essential services. According to Fournier and Johansson (2016), higher public spending is generally associated with declining inequality, a finding supported by Anyanwu (2011) and Ebeke and Le Goff (2011). Foreign aid is included to account for the poverty reduction initiatives present in many countries receiving remittances in the Latin America sample. As a significant source of external funding, official development assistance (ODA) as a percentage of GDP is used to measure the role of aid in mitigating economic inequality (Vacaflores, 2018). Trade openness influences income inequality through structural economic shifts and employment redistribution. Empirical studies such as Woo et al. (2017) suggest that more open economies experience lower inequality, as trade expands job opportunities and raises incomes in export-driven sectors. However, trade liberalisation can also exacerbate inequality if specific sectors or workers are disproportionately affected by increased competition.

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Unemployment is a key determinant of income inequality, as job availability directly affects household earnings. Higher unemployment rates tend to increase inequality, particularly among lower-income populations who rely on wage-based income and lack financial buffers (Vacaflores, 2018). This study incorporates the unemployment rate in remittance-receiving countries to control for variations in labor market conditions that may shape inequality dynamics.

Table 2 demonstrates the detailed definitions of all the variables employed in this paper.

Variables	Description	Sources
Gini index	Measures the extent to which the distribution of income or consumption among individuals or households within an economy deviates from a perfectly equal distribution.	WIID
Relative Income	Ratios of the lowest-income decile to highest-income deciles.	WIID
Remittances/GDP	Personal remittances comprise personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from nonresident households. Personal transfers thus include all current transfers between resident and nonresident individuals.	WDI
Conflicts	Measures the number of conflict-related deaths relative to population.	UCDP
Real GDP per capita	Measured by gross domestic product divided by midyear population (constant 2010 US$).	WDI
Inflation	Measured by the consumer price index which reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services.	WDI
Government expenditure (% of GDP)	General government final consumption expenditure (% of GDP).	WDI
Foreign aid	Measured by the net ODA received (% of GNI) which provides a measure of the recipient country's dependency on aid.	WDI
Trade openness	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	WDI
Unemployment	The share of the labor force that is without work but available for and seeking employment.	WDI

Table 2: Description of variables

Table 3 presents the correlation between variables.

Variable	Gini pre-tax	Gini post-tax	Top 10 Bottom 10	Top 10 Bottom 50	Top 20 Bottom 20	Top 30 Bottom 30	Top 40 Bottom 40	Top 20 Middle 20	Remittances	Conflict	Real GDP per capita	Inflation	Government expenditure	Official Dev. Aid	Trade openness	Unemployment
Gini pre-tax	1	0.927	0.9329	0.1567	0.365	0.5474	0.7048	0.1189	-0.0196	0.3305	-0.2585	-0.1514	-0.1377	0.0206	0.0175	-0.0096
Gini post-tax	0.927	1	0.8499	0.3553	0.5713	0.7224	0.8469	0.3058	0.0817	0.2733	-0.3734	-0.0902	-0.3096	0.1577	-0.0949	0.0306
Top 10 Bottom 10	0.9329	0.8499	1	0.1156	0.3508	0.5555	0.7329	0.2383	-0.0574	0.4444	-0.1413	0.0941	-0.1748	-0.0516	-0.0604	-0.039
Top 10 Bottom 50	0.1567	0.3553	0.1156	1	0.8326	0.6066	0.9274	0.275	0.4128	0.0995	-0.459	0.0562	-0.4752	0.4887	-0.1926	0.3472
Top 20 Bottom 20	0.365	0.5713	0.3508	0.8326	1	0.9274	0.8316	0.4389	0.5288	0.148	-0.6043	0.018	-0.5347	0.4656	-0.0949	0.142
Top 30 Bottom 30	0.5474	0.7224	0.5555	0.6066	0.9274	1	0.9551	0.5196	0.4252	0.148	-0.5614	-0.0363	-0.5133	0.3347	-0.0351	0.0024
Top 40 Bottom 40	0.7048	0.8469	0.7329	0.9274	0.8316	0.9551	1	0.5645	0.3165	0.229	-0.5013	0.1442	-0.4757	0.2812	-0.0275	-0.0323
Top 20 Middle 20	0.1189	0.3058	0.2383	0.275	0.4389	0.5196	0.5645	1	0.2238	0.0755	-0.2102	-0.0607	-0.5051	0.207	0.1281	-0.3521
Remittances	-0.0196	0.0817	-0.0574	0.4128	0.5288	0.4252	0.3165	0.2238	1	-0.0444	-0.6838	0.2521	-0.0688	0.4398	0.263	-0.1407
Conflict	0.3305	0.2733	0.4444	0.0995	0.148	0.229	0.0755	0.3072	-0.0444	1	-0.6838	-0.0028	0.001	-0.0657	-0.1512	0.141
Real GDP per capita	-0.2585	-0.3734	-0.1413	-0.459	-0.6043	-0.5614	-0.5013	-0.2102	-0.6838	-0.6838	1	0.2521	0.1346	-0.5512	-0.1505	0.1533
Inflation	-0.1514	-0.0902	0.0941	0.0562	0.018	-0.0363	0.1442	-0.0607	0.2521	-0.0028	0.2521	1	-0.1365	-0.037	0.0844	0.1055
Government expenditure	-0.1377	-0.3096	-0.1748	-0.4752	-0.5347	-0.5133	-0.4757	-0.5051	-0.0688	0.001	0.1346	-0.1365	1	-0.1579	-0.1482	-0.3715
Official Dev. Aid	0.0206	0.1577	-0.0516	0.4887	0.4656	0.3347	0.2812	0.207	0.4398	-0.0657	-0.5512	-0.0367	-0.1579	1	0.0732	-0.0345
Trade openness	0.0175	-0.0949	-0.0604	-0.1926	-0.0949	-0.0351	-0.0275	0.1281	0.263	-0.1512	-0.1505	0.0844	-0.1482	0.0732	1	0.1055
Unemployment	-0.0096	0.0306	-0.039	0.3472	0.142	0.0024	-0.0323	-0.3521	-0.1407	0.141	0.1533	0.2143	-0.3715	-0.0345	0.1055	1

Table 3: Correlation matrix of key variables

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3.2. Model

To examine how conflict influences the relationship between remittances and income inequality, this study first estimates the direct effects of remittances and conflict on inequality. Drawing on prior research (Bkwayep and Tsafack, 2020; Adams and Klobodu, 2017; Zghidi, Sghaier and Abida, 2018), the baseline equation is:

$$Inequality_{it} = \beta_1 Inequality_{it-1} + \beta_2 Remittances_{it-1} + \beta_3 Conflict_{it} + \beta_4 Conflict_{it-1} + \beta_5 X_{it} + \mu_{it} + \nu_t + \varepsilon_{it} \quad (1)$$

where $Inequality_{it}$ represents income inequality indicators, measured by the Gini coefficient and income share ratios. $Remittances_{it-1}$is the remittance inflow (expressed as a percentage of GDP) lagged by one year to address potential endogeneity. $Conflict_{it}$ represents the conflict variable, including the contemporaneous and lagged form $Conflict_{it-1}$, to capture both immediate and persistent effects of conflict on inequality. X_{it} denotes a vector of control variables influencing inequality, μ_{it} accounts for country-specific unobserved heterogeneity, ν_t represents time-fixed effects, and ε_{it} is the error term.

Besides the direct impact of remittances and conflict described in equation (1), the study explores whether conflict modifies remittances' impact on inequality by adding an interaction term. The extended specification is:

$$Inequality_{it} = \beta_1 Inequality_{it-1} + \beta_2 Remittances_{it-1} + \beta_3 Conflict_{it} + \beta_4 Conflict_{it-1} + \beta_5 (Conflict_{it} \times Remittances_{it-1}) + \beta_6 X_{it} + \mu_{it} + \nu_t + \varepsilon_{it} \quad (2)$$

where $(Conflict_{it} \times Remittances_{it-1})$ is the interaction term that captures the conditional effect of remittances on inequality in conflict. To interpret this relationship, the marginal effect of remittances on inequality conditional on conflict intensity is computed as:

$$\frac{\partial Inequality_{it}}{\partial Remittances_{it-1}} = \beta_2 + \beta_5 Conflict_{it} \quad (3)$$

If $\beta_5 > 0$, this suggests that conflict weakens the inequality-reducing effects of remittances or amplifies their inequality-increasing effects, possibly due to wealthier households benefiting more from remittance inflows during conflict periods. Conversely, if $\beta_5 < 0$, this implies that conflict enhances the inequality-reducing effects of remittances, potentially because poorer households become more reliant on external support during crises.

This study includes contemporaneous and lagged conflict variables to differentiate between short-term and persistent effects on inequality. Contemporaneous conflict disrupts labor markets, weakens institutions, and erodes economic stability, leading to immediate increases in inequality. However, even after active conflict subsides, long-term consequences such as capital destruction, displacement, and institutional breakdown may continue to shape inequality dynamics. The inclusion of lagged conflict allows for an assessment of these persistent effects and whether inequality worsens or improves in post-conflict periods. Similarly, remittances are included in lagged form following Vacaflores (2018) to mitigate endogeneity concerns. Since remittance flows can be both a response to and a driver of inequality, using lagged remittances ensures that current inequality levels do not directly influence remittance inflows, reducing simultaneity bias.

3.3. Methodology

This study follows the approach of several papers (e.g., Bkwayep and Tsafack, 2020; Ambassa et al., 2024) in employing the System Generalized Method of Moments (S-GMM) estimator, as initially proposed by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). The use of GMM is particularly suited to this study for several reasons.

First, the panel data structure meets the condition for GMM estimation, with the number of cross-sectional units (countries) exceeding the number of time periods (years). In this dataset, there are 20 countries (N=20) and 14 years (T=14) spanning 2001 to 2014. Second, the inequality variables exhibit persistence, as demonstrated by the high correlation between their levels and first lags. A correlation above 0.800 is widely considered a threshold for establishing persistence (Asongu and Nwachukwu, 2016; Tchamyou, Erreygers and Cassimon, 2019). In this study, the correlation values for the Gini coefficient, Top 10 Bottom 50, Top 10 Bottom 10, Top 20 Bottom 20, Top 30 Bottom 30, Top 40 Bottom 40, and Top 20 Middle 20 ratios range from 0.9326 to 0.9901, confirming persistence. The S-GMM estimator is particularly effective in handling dynamic panel data, where past values of inequality significantly influence current values.

Third, the GMM strategy accounts for cross-country variations in the estimation, making it appropriate for panel data. Fourth, a key advantage of GMM is its ability to address endogeneity concerns and avoid biases due to simultaneity or reverse causality. Several studies have highlighted the endogeneity of remittances in inequality models (Koechlin and Leon, 2006; Chauvet, Gubert and Mesplé-Somps, 2009). This endogeneity arises from multiple sources: (i) measurement errors, as remittance data often fail to capture informal transfer channels; (ii) omitted variable bias, where exogenous shocks, such as price shocks or climate-related events, may simultaneously affect inequality and remittance inflows; and (iii) reverse causality, where higher inequality may drive increased remittance flows, while remittances, in turn, shape income distribution. To mitigate these concerns, this study implements four key strategies: (i) using a dynamic panel data estimation, where past observations serve as instruments for explanatory variables, (ii) incorporating a lagged measure of remittances, ensuring that past inequality does not influence current remittance flows, (iii) explicitly treating remittances as an endogenous variable, and (iv) employing internal instruments through the GMM framework.

A well-specified GMM estimation requires a robust identification strategy and a careful consideration of exclusion restrictions. Following the literature (Asongu and Nwachukwu, 2016; Tchamyou, Erreygers and Cassimon, 2019), this study classifies all explanatory variables as predetermined, suspected endogenous, or endogenous explaining, and exogenous variables are assumed to be uncorrelated with the error term and serve as instruments.

The lagged dependent variable, inequality, is included to account for persistence, as past inequality levels significantly influence current inequality dynamics. To mitigate simultaneity bias and reverse causality, it is treated as predetermined and instrumented using deeper lags, following the Arellano-Bond (1991) approach. Conflict is treated as endogenous due to potential reverse causality, where inequality can influence conflict and vice versa. To address this, the current conflict is instrumented using its first lag, ensuring that past conflict levels rather than current inequality drive the relationship. In contrast, lagged conflict is treated as exogenous, as it is a strong predictor of present conflict while being assumed not to have a direct contemporaneous effect on inequality beyond its indirect influence through present conflict. This distinction allows the model to separate the long-term effects of conflict from its immediate effects on inequality. Similarly, remittances are also classified as endogenous, as prior literature like Vacaflores (2018) highlights the bidirectional relationship between remittances and inequality. To correct for this, remittances are instrumented using their first and second lags, eliminating contemporaneous bias and ensuring that remittance inflows are driven by past economic conditions rather than current inequality. Additionally, the interaction between lagged remittances and conflict is considered "suspected endogenous," as both components are themselves endogenous. This allows the model to capture the dynamic relationship between remittance inflows and conflict without suffering from simultaneity bias.

Control variables, including GDP per capita, inflation, government expenditure, foreign aid, trade openness, and unemployment rate, are treated as endogenous, as these macroeconomic factors may both influence and be influenced by inequality. To address potential simultaneity bias and ensure instrument validity, each control variable is instrumented using its first lag, following the approach of Milanovic (2005), who employed lagged values of explanatory variables to mitigate endogeneity concerns. Additionally, the lagged values of GDP per capita and inflation are used as exogenous instruments as they exhibit a strong correlation with their contemporaneous values while remaining uncorrelated with the error term, thereby ensuring instrument relevance (Arellano and Bond, 1991).

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This study employs the two-step estimator, which has been found to be more efficient than the one-step estimator due to its reliance on optimal weighting matrices (Law et al., 2018). To validate the GMM specification, three key diagnostic tests are conducted: 1) the Arellano-Bond tests which examines whether the error term is not serially correlated, implicitly assumed in the orthogonality conditions; 2) The Hansen test, which assesses the overall validity of the instruments to ensure they are not overidentified; 3) The difference-in-Hansen test, which evaluates the validity of the instruments used in the level equations of the system GMM estimator. The exclusion restriction assumption is validated if the difference-in-Hansen test fails to reject the null hypothesis, confirming that the identified strictly exogenous variables influence inequality only through suspected endogenous or predetermined channels. However, if the null hypothesis is rejected, it suggests that the chosen instruments may directly affect inequality, raising concerns about the validity of the identification strategy.

4. Results

4.1. Baseline model with Gini pre-tax

This section presents the baseline model results examining the impact of remittances and conflict on income inequality before taxation, as measured by the Gini pre-tax coefficient. The results are shown across three specifications in Table 4: (1) the basic model without controls or interaction, (2) the model including controls but without interaction, and (3) the model incorporating both controls and the interaction between remittances and conflict.

Variables	No controls or interaction	Controls with no interaction	Control variables and interaction
L1_Gini pre-tax	0.999*** (0.00129)	1.007*** (0.0199)	1.009*** (0.0235)
L1_Conflict	-0.106** (0.0486)	-0.108** (0.0522)	-0.136*** (0.0378)
Conflict	0.117*** (0.0306)	0.129*** (0.0333)	0.218*** (0.0376)
L1_Remittances	-0.000485** (0.000237)	-0.00120** (0.000512)	-0.000711* (0.000432)
L1_Remittances × Conflict			-0.0237*** (0.00609)
Real GDP per capita		-6.0297E-13	-3.81e-07 (6.31e-07)
Inflation		7.12e-05 (0.000102)	2.54e-05 (0.000115)
Government expenditure		7.20e-05 (0.000611)	-0.000646 (0.000879)
Official Dev. Aid		0.000179 (0.000276)	0.000107 (0.000306)
Trade openness		0.000105 (0.000139)	0.000130 (0.000137)
Unemployment		-0.000479 (0.000553)	-0.000433 (0.000523)
Observations	260	260	260
AR(1)	0.04	0.039	0.041
AR(2)	0.997	0.952	0.945
Hansen	0.469	0.342	0.355

*Note: Statistical significance is given by *p < 0.10, **p < 0.05, ***p < 0.01. Standard errors reported in parenthesis*

Table 4: Baseline model with Gini pre-tax

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The diagnostic tests validate the robustness of the econometric approach for all the specifications used in the paper. The AR(1) test is significant across all specifications, indicating first-order serial correlation, which is expected. The AR(2) test is not significant, suggesting no second-order autocorrelation and confirming the suitability of the System Generalized Method of Moments (S-GMM) estimator. The Hansen test for overidentifying restrictions is also not significant, indicating that the instruments are valid and uncorrelated with the error term. The Sargan test, though not robust, is not weakened by instrument proliferation, whereas the Hansen test is robust but sensitive to overfitting. Consistent with standard econometric practice (Tchamyou, Erreygers and Cassimon, 2019), the Hansen test is preferred. The instrument count remains below the number of groups, minimizing the risk of overfitting. Lastly, the Difference-in-Hansen test (DHT) confirms the validity of the Hansen test results, collectively indicating that the model is well-specified, the instruments are exogenous, and there are no major identification issues.

4.1.1. Effect of remittances on inequality

In the first specification, which excludes control variables and interaction terms, the coefficient for lagged remittances (L1_Remittances) is negative and statistically significant at the 5% level (-0.000485, $p<0.05$). This suggests that higher remittance inflows contribute to a reduction in pre-tax income inequality. This finding aligns with previous literature, which suggests that remittances serve as an income-smoothing mechanism, particularly for lower-income households. By providing financial stability and facilitating investments in education, healthcare, and entrepreneurship, remittances enable recipients to improve their long-term economic standing (Adams and Klobodu, 2017; Vacaflores, 2018).

When macroeconomic controls, such as GDP per capita, inflation, government spending, and trade openness, are introduced in the second specification, the magnitude of the inequality-reducing effect of remittances intensifies (-0.00120, $p<0.05$). This persistence suggests that remittances maintain an independent role in curbing inequality, beyond broader economic conditions. The result implies that remittances not only supplement household resources but also foster meaningful redistribution by bolstering the incomes of lower-income groups, in line with several cross-country studies (Acosta et al., 2008; Akobeng, 2016).

The third specification introduces an interaction term between lagged remittances and conflict (L1_Remittances x Conflict) to capture the extent to which remittances mitigate inequality in conflict-affected environments. The coefficient for lagged remittances remains negative (-0.000711, $p<0.10$) but becomes less statistically significant than in previous specifications. This indicates that while remittances still help reduce inequality, their effectiveness is conditional on conflict dynamics, reinforcing the relevance of the interaction term. These findings are consistent with prior studies (Acosta et al., 2008; Akobeng, 2016), which argue that remittances are most effective in reducing inequality when migration costs are low, allowing a larger proportion of the poor to migrate and send financial support home. The results also suggest that Latin America may benefit from established migration networks in destination countries, which facilitate continued remittance flows and broader economic gains for receiving households, thus reducing inequality.

4.1.2. Effect of conflict on inequality

In the first specification, the lagged conflict variable is negative and significant at the 5% level (-0.106, $p<0.05$), implying that past conflict is associated with reduced inequality in subsequent years. This counterintuitive result suggests that post-conflict economic adjustments, such as increased aid flows, post-war reconstruction, or social safety nets, play a role in mitigating inequality after conflict subsides. At the same time, the contemporaneous conflict index (Conflict) is positive and highly significant (0.117, $p<0.01$), confirming that active conflict exacerbates inequality by undermining labor markets, limiting economic opportunities for disadvantaged groups, and creating heightened economic vulnerability (Novta and Pugacheva, 2021).

Introducing control variables in the second specification preserves the negative, statistically significant effect of lagged conflict (-0.108, $p<0.05$), reinforcing the idea that past conflict events may trigger policy responses or development interventions that gradually reduce inequality. The contemporaneous conflict index remains positive and significant (0.129, $p<0.01$), consistent with the notion that ongoing instability further widens income gaps.

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In the third specification, the conflict index becomes even more positive and statistically significant (0.218, p<0.01), suggesting that the destabilising effects of ongoing conflict on inequality become even more pronounced when adjusting for remittances and broader economic conditions. Interestingly, the coefficient for lagged conflict grows in both magnitude and significance (-0.136, p<0.01), highlighting that any long-term inequality-reducing mechanisms associated with past conflict, such as reconstruction, targeted social programs, or international aid, may grow stronger over time.

4.1.3. Interaction between remittances and conflict

The interaction term in the third specification is negative and highly significant (-0.0237, p<0.01), clearly indicating that remittances have a more potent inequality-reducing effect during periods of heightened conflict. This critical finding highlights remittances' role as essential financial buffers in fragile and conflict-affected contexts, stabilizing household incomes where formal institutions and welfare systems may collapse or become severely weakened (Ebeke and Le Goff, 2011).

To interpret this interaction quantitatively, we substitute the estimated coefficients into Equation (3):

$$\frac{\partial Inequality_{it}}{\partial Remittances_{it-1}} = -0.000711 + (-0.0237 \times Conflict_{it})$$

This expression shows that in the absence of conflict ($Conflict_{it}$= 0), remittances reduce inequality by approximately 0.000711, indicating a statistically significant inequality-reducing effect even in conflict-free settings. As conflict intensity rises ($Conflict_{it}$> 0), the term $(-0.0237 \times Conflict_{it})$ further reduces inequality, meaning remittances become even more effective at reducing inequality. Figure 1 visually illustrates this relationship, plotting the marginal effect of remittances on inequality across different levels of conflict. The red line represents the estimated marginal effect, while the shaded area denotes the 95% confidence interval. As seen in the figure, the marginal effect becomes increasingly negative with higher conflict intensity. This reinforces the Insurance Hypothesis as households rely on remittances as a form of financial protection during periods of heightened risk and instability (Lucas and Stark, 1985). In conflict-affected settings, remittances serve as a crucial safety net for households experiencing displacement, loss of income, or the breakdown of formal institutions.

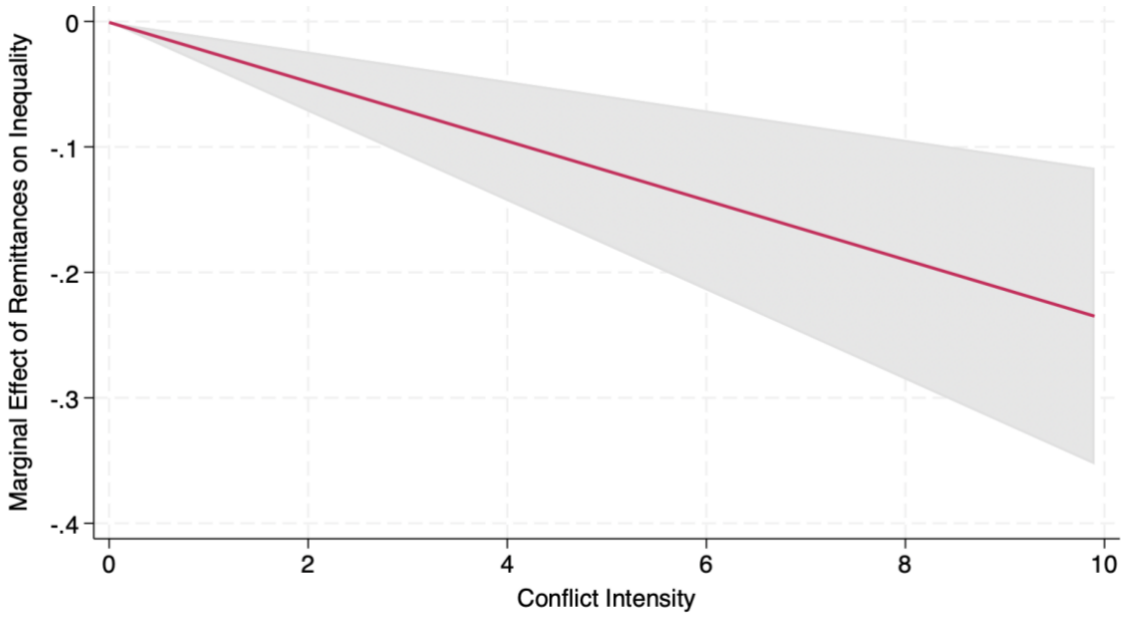

***Figure 1*:** Marginal effect of remittances by level of conflict

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4.2. Robustness check: Impact on different income ratios

To test the robustness of the findings and explore how remittances affect income inequality across different segments of the population, this section examines both the post-tax Gini coefficient and a set of alternative inequality measures. Specifically, we use income share ratios comparing the top 10%, 20%, 30%, and 40% of earners with their corresponding bottom percentiles, as well as ratios comparing the top 10% to the bottom 50%, and the top 20% to the middle 20%. These metrics provide a narrower view of how remittances affect income disparities across different segments of the population. Table 5 presents the results of these specifications.

Variables	Gini post-tax	Top 10 Bottom 10	Top 20 Bottom 20	Top 30 Bottom 30	Top 40 Bottom 40	Top 10 Bottom 50	Top 20 Middle 20
L1_Gini post-tax	0.995***						
	(0.0148)						
L1_Top 10 Bottom 10		1.090***					
		(0.0679)					
L1_Top 20 Bottom 20			1.045***				
			(0.0348)				
L1_Top 30 Bottom 30				0.996***			
				(0.0622)			
L1_Top 40 Bottom 40					0.985***		
					(0.0559)		
L1_Top 10 Bottom 50						1.050***	
						(0.0357)	
L1_Top 20 Middle 20							0.990***
							(0.0247)
L1_Conflict	-0.0450	-31.89	-155.7**	-34.49***	-10.79***	-58.23***	0.715
	(0.0481)	(105.3)	(70.75)	(12.65)	(4.015)	(9.042)	(0.818)
Conflict	0.0308	574.4**	250.5***	43.33***	12.58***	69.11***	-0.514
	(0.0467)	(262.5)	(95.90)	(12.15)	(4.275)	(11.27)	(1.240)
L1_Remittances	-0.00106*	-2.000***	-3.000***	-0.413	-0.133**	-0.108	-0.0212*
	(0.000608)	(0.759)	(1.098)	(0.277)	(0.0555)	(0.0713)	(0.0117)
L1_Remittances × Conflict	-0.00540	-313.1***	-126.2***	-11.99***	-3.090***	-9.435***	-0.0832**
	(0.00820)	(53.63)	(28.30)	(3.384)	(1.050)	(1.752)	(0.0391)
Real GDP per capita	-0.0000011*	-0.00291	-0.00326**	-0.000480	-0.000156*	-0.000103**	-1.95e-05
	(0.00000063)	(0.00226)	(0.00143)	(0.000329)	(0.0000843)	(4.98e-05)	(1.42e-05)
Inflation	9.11e-05	0.159	0.0214	-0.0133	0.00942	0.0120	0.00221
	(0.000137)	(0.275)	(0.227)	(0.0695)	(0.0165)	(0.0124)	(0.00298)
Government Expenditure	-0.000330	0.411	1.669	0.311	0.124	-0.0592	-0.000847
	(0.000703)	(0.981)	(1.497)	(0.461)	(0.132)	(0.0946)	(0.0163)
Official Dev. Aid	-0.000424	-4.830***	-3.767***	-0.455	-0.107	-0.0412	-0.00574
	(0.000542)	(1.843)	(1.184)	(0.338)	(0.0885)	(0.0862)	(0.0135)
Trade Openness	0.000190	0.0971	0.0538	0.0150	0.00489	0.0106	0.00291
	(0.000135)	(0.126)	(0.198)	(0.0309)	(0.00981)	(0.0161)	(0.00207)
Unemployment	0.000369	1.475	0.0748	-0.0644	-0.0436	-0.114	-0.00207
	(0.000696)	(3.239)	(1.598)	(0.388)	(0.0729)	(0.0909)	(0.0146)
Observations	260	260	260	260	260	260	260
AR(1)	0.027	0.041	0.008	0.028	0.032	0.039	0.026
AR(2)	0.208	0.35	0.135	0.485	0.493	0.803	0.366
Hansen	0.747	0.925	0.737	0.387	0.458	0.898	0.705

*Note: Statistical significance is given by *p < 0.10, **p < 0.05, ***p < 0.01. Standard errors reported in parenthesis*

***Table 5*:** Robustness check: Different measures of inequality

4.2.1. Effect of remittances on inequality

The effect of remittances on inequality remains largely consistent across different measures, although the magnitude and significance vary. For the post-tax Gini coefficient, the coefficient for lagged remittances remains negative and statistically significant at the 10% level (-0.00106, p<0.10). This suggests that remittances continue to reduce income inequality even after accounting for the redistributive effects of taxation and transfers. However, the effect is weaker than the pre-tax Gini results, indicating that government intervention may already mitigate some of the inequality that remittances seek to alleviate. This aligns with previous findings that remittances play a stronger role in inequality reduction in countries with weaker welfare states due to existing government redistribution mechanisms (Valencia, 2016).

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The results of the income share ratios provide further insights. The impact of remittances is particularly strong and highly significant for the Top 10/Bottom 10 and Top 20/Bottom 20 ratios, with coefficients of -2.000 and -3.000 ($p<0.01$), respectively. This suggests that remittances disproportionately benefit the poorest 10% and 20% of the population relative to the wealthiest groups. These findings support the argument that remittances function as a redistributive tool, helping the most economically disadvantaged households close the income gap with wealthier households (Vacaflores, 2018).

The effect of remittances on the Top 30/Bottom 30 and Top 40/Bottom 40 ratios is smaller in magnitude and statistically significant at the 5% and 10% levels, respectively. This indicates that while remittances reduce inequality at the broader middle and lower income levels, their strongest effects are concentrated among the most disadvantaged groups. This pattern suggests that remittances primarily flow to the poorest households rather than being distributed evenly across the lower and middle income groups.

The Top 20/Middle 20 ratio results show a weaker effect, with the coefficient significant at only the 10% level (-0.0212, $p<0.10$). This implies that remittances have a relatively weaker role in closing the income gap between the middle class and the upper-income groups compared to their effect on reducing disparities between the poor and the rich. This is consistent with prior studies indicating that remittances may be less effective in lifting middle-income households, as they are often used for immediate consumption rather than long-term investment in productive assets that could generate sustained income growth (Koechlin and Leon, 2007).

4.2.2. Effect of conflict on inequality

The relationship between conflict and inequality varies depending on the measure of inequality used. For the post-tax Gini coefficient, the lagged conflict variable is negative (-0.0450) but not statistically significant, suggesting that past conflict does not directly impact inequality when considering post-tax income distributions. However, for the Top 10/Bottom 10, Top 20/Bottom 20, and Top 30/Bottom 30 ratios, the effect of lagged conflict is large and significant at the 1% level. These results indicate that past conflict tends to reduce inequality, possibly due to economic redistribution in post-conflict recovery efforts, such as increased aid inflows, labor market restructuring, and post-war government policies to rebuild economic stability (Novta and Pugacheva, 2021).

In contrast, the contemporaneous conflict index is positive and highly significant across multiple inequality measures, particularly for the Top 10/Bottom 10, Top 20/Bottom 20, and Top 40/Bottom 40 ratios, indicating that ongoing conflict exacerbates inequality by disproportionately harming low-income groups. This effect is especially pronounced for the Top 10/Bottom 50 ratio, where the coefficient is 69.11 ($p<0.01$), suggesting that conflict further widens the gap between the richest 10% and the bottom 50% of the population. These results confirm that active conflict exacerbates inequality by disproportionately harming lower-income groups, who are more vulnerable to displacement, job loss, and institutional breakdown (Fang et al., 2020). The differential impact of conflict across ratios further illustrates that its effects are most severe at the bottom of the income distribution.

Interestingly, conflict does not significantly affect the Top 20/Middle 20 ratio, suggesting that while conflict exacerbates disparities between the wealthiest and poorest groups, it does not significantly alter income distributions between the middle and upper classes. This may be because middle-income households often have greater economic resilience during periods of conflict, such as through diversified income sources, higher levels of education, and greater access to remittance inflows.

4.2.3. Interaction between remittances and conflict

The interaction between lagged remittances and conflict reinforces the earlier findings. Across most inequality measures, the interaction term is negative and statistically significant, highlighting that remittances become more effective in reducing inequality under conditions of conflict. The strongest effects are observed for the Top 10/Bottom 10, Top 20/Bottom 20, and Top 40/Bottom 40 ratios, where the interaction term is highly significant ($p<0.01$). This suggests that remittances act as an even more critical income-stabilizing mechanism during periods of instability, helping to offset the economic disruptions caused by conflict.

The impact of the interaction term is particularly notable for the Top 10/Bottom 50 ratio (-9.435, $p<0.01$), highlighting that remittances substantially mitigate inequality when considering a broader portion of the lower-income population. In the context

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of conflict, when social protection systems are weakened or absent, remittances appear to step in as an informal safety net, supporting consumption, enabling access to basic services, and preventing more severe declines in household welfare. These findings align with the Insurance Hypothesis (Lucas and Stark, 1985), which posits that remittances act as a buffer against income shocks, especially in high-risk settings. When formal safety nets deteriorate, remittances help recipients maintain minimum living standards, thereby containing inequality from widening further.

This protective effect, however, appears to taper off higher up the income distribution. For the Top 20/Middle 20 ratio, the interaction term is negative but smaller in magnitude (-0.0832) and only significant at the 10% level. This suggests that the ability of remittances to reduce inequality between the middle and upper-income groups is more limited, possibly because middle-income households already possess greater economic resilience through diversified income sources, assets, or educational advantages. Consequently, remittances, while still beneficial, have less pronounced redistributive impact among these groups.

To further illustrate how the interaction between remittances and conflict variables varies across the income distribution, Figure 2 plots the estimated coefficients on the interaction term for each income ratio. Each point corresponds to the coefficient from a separate regression.

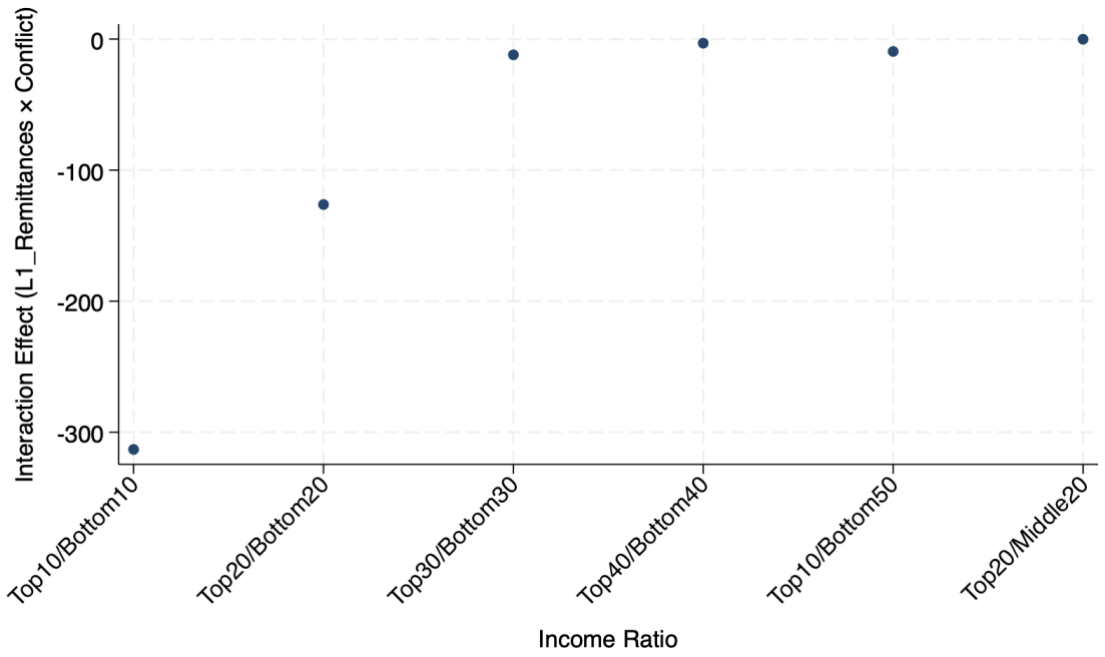

***Figure 2*:** Interaction effect of remittances and conflict on inequality across income ratios

As depicted in Figure 2, the inequality-reducing effect of remittances during periods of conflict is most pronounced at the lower end of the income distribution. The interaction coefficient for the Top 10/Bottom 10 ratio is the largest in magnitude at -313.1, followed by Top 20/Bottom 20 at -126.2, both of which are statistically significant at the 1% level. These results suggest that remittances play a particularly powerful stabilising role in reducing extreme income disparities when conflict is present. In contrast, the coefficients for broader income ratios, such as Top 30/Bottom 30, Top 40/Bottom 40, and Top 10/Bottom 50, are smaller in absolute value, although still negative. This indicates a more modest redistributive effect in the middle segments of the income distribution. Interestingly, the coefficient for the Top 20/Middle 20 ratio is the weakest and only marginally significant, reinforcing the idea that remittances have less impact on middle-income groups during conflict.

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5. Policy implications

The findings of this study carry important implications for designing inequality-reduction policies in Latin America, particularly in conflict-affected settings, where remittances play a critical stabilising role. To ensure that remittance inflows effectively reduce income inequality, especially among the most vulnerable populations, policymakers must adopt conflict-sensitive strategies that preserve and enhance these financial flows' impact.

Governments should prioritise measures to significantly reduce the transaction costs of sending remittances. High transfer fees disproportionately burden lower-income migrants, diminishing the net financial support available to recipient households. Regulatory reforms should encourage competition among financial institutions and money transfer operators, which can lead to lower prices and greater efficiency. Additionally, promoting technological innovations such as digital banking services, mobile money, and blockchain solutions can further reduce costs and improve access, particularly for communities in remote or conflict-impacted areas. Transparent fee structures and enhanced consumer protection frameworks should also be implemented to empower migrants with clear information, enabling informed financial choices. Collaborative partnerships with international bodies, such as the World Bank's Remittance Prices Worldwide initiative, can help establish benchmarks and drive ongoing improvements.

Establishing and maintaining secure remittance corridors during periods of conflict is equally crucial. Conflict-sensitive remittance policies should incorporate rigorous contingency planning to ensure the continuous operation of financial services, even amid instability or violence. Policymakers must institute robust regulatory frameworks to maintain functional remittance channels, safeguard transactions from misuse by illicit groups, and protect migrants and recipients from exploitation. Strategic partnerships with diaspora networks and international financial institutions are essential in creating resilient transfer systems capable of withstanding disruptions. These measures ensure that remittance flows remain consistent, reliable, and secure, providing an essential economic buffer for households affected by conflict-induced economic shocks. Additionally, rapid recovery plans should be implemented to swiftly restore remittance infrastructure following episodes of violence, preventing prolonged economic hardship and aiding rapid economic stabilisation.

Policymakers must actively pursue equitable migration policies to broaden access for lower-income individuals who typically face substantial barriers to international mobility. Conflict environments often exacerbate existing inequalities by limiting migration opportunities primarily to wealthier households, reinforcing socioeconomic disparities. Addressing this requires inclusive migration frameworks that reduce the financial and logistical burdens associated with migration. Governments could establish subsidised migration programs, simplified and affordable visa procedures, and secure legal migration pathways to facilitate broader participation among economically disadvantaged groups. Furthermore, bilateral labor agreements with key migrant destination countries can formalise and protect migration processes, ensuring safer migration routes and reducing vulnerability to exploitation. Enhanced information dissemination about legal migration routes, employment opportunities abroad, and the rights and protections available to migrants can also help improve access to migration. By making migration more equitable, policymakers can ensure that remittance inflows reach broader population segments, maximising their inequality-reducing effects.

In conflict-affected settings, institutional fragility significantly constrains households' abilities to utilise remittances for productive and sustainable economic activities. Strengthening financial inclusion is, therefore, a critical policy objective. Governments should prioritise investments in expanding the reach and accessibility of financial institutions, particularly in rural and marginalised regions. Promoting mobile money platforms, rural banking infrastructure, and tailored financial services such as savings accounts, microloans, and insurance products designed explicitly for remittance recipients can significantly enhance financial accessibility. Additionally, comprehensive financial literacy and capacity-building programs should be introduced to encourage households to allocate remittance funds beyond immediate consumption toward productive investments such as education, healthcare, entrepreneurial activities, and asset accumulation. These interventions can potentially transform remittances from temporary relief into sustainable tools for economic growth, social mobility, and long-term resilience, which are especially crucial in post-conflict recovery phases.

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6. Conclusion

An extensive body of literature explores the role of remittances in shaping income distribution and addressing inequality in developing countries. However, far less attention has been paid to how conflict moderates the relationship between remittances and income inequality. This study addresses this important gap by examining the interaction between remittances, conflict, and inequality in Latin America, a region marked by entrenched inequality, widespread migration networks, and a persistent history of internal conflict. Using a balanced panel dataset of 20 Latin American countries spanning 2001 to 2014, this study applies dynamic panel estimation methods, specifically the two-step System GMM estimator, to account for endogeneity, persistence, and country-specific effects. This study finds that remittances play a significant role in reducing income inequality, particularly in conflict-affected settings. These findings are robust across multiple inequality indicators, including pre-tax and post-tax Gini coefficients and various income share ratios.

The results show that while remittances generally reduce income inequality, their effects are conditioned by the presence of conflict. Conflict amplifies the importance of remittances as a financial lifeline and constrains their potential as an engine for long-term economic transformation. The interaction between remittances and conflict is negative and statistically significant, suggesting that remittances become even more vital in cushioning vulnerable households from the adverse economic shocks induced by violence. However, this stabilising role is limited by structural inequalities in migration access: wealthier households are more likely to send migrants abroad and thus disproportionately benefit from remittance inflows. Furthermore, in conflict settings, remittances are often used for immediate consumption rather than investment, reducing their capacity to support upward mobility and long-term reductions in inequality.

The findings suggest that remittances reduce income inequality, particularly in conflict-affected settings. The interaction between conflict and remittances is negative and statistically significant across multiple specifications, indicating that the inequality-reducing effect of remittances is stronger in contexts of heightened conflict. However, these effects are not uniform across income groups. While remittances significantly narrow the income gap between the poorest and the wealthiest segments of the population, their effect on middle-income groups is less pronounced.

Nevertheless, this study has limitations. The results cannot be generalised to regions outside Latin America without caution, as the presence of strong migration networks and proximity to the United States may mitigate some of the inequality-increasing effects of conflict. Future research could explore comparative analyses across different world regions, particularly in Sub-Saharan Africa or South Asia, where remittance and conflict dynamics may differ significantly. Further studies could also examine underexplored moderating factors such as gender, informality, or access to property and credit, which may further condition the relationship between conflict, remittances, and inequality. Exploring whether remittances have different effects in countries with persistent or high-intensity conflict may also be useful. One approach would be to construct a ‘high-conflict’ dummy variable, based on a threshold above the sample mean, and interact it with remittances to test whether the observed relationship is driven by conflict or by how more severely affected countries respond. Similarly, future studies could examine the role of conflict volatility, proxied by the standard deviation of conflict intensity, to assess whether remittance effects differ in more unstable environments.

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Appendix

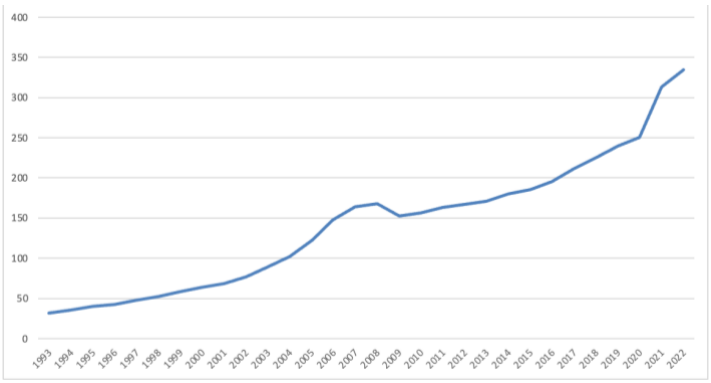

Figure A: Average remittances per capita in Latin America

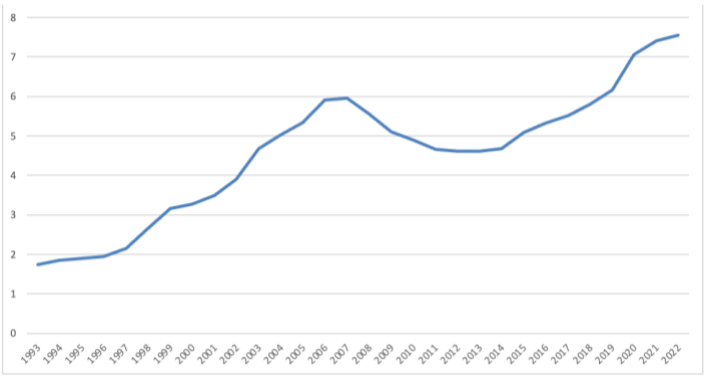

***Figure B*:** Average remittances % of GDP in Latin America

Source: Authors' own illustration using data from World Bank estimates based on IMF balance of payments data, calculating remittances per capita by dividing remittances by population, and calculating both averages by computing the simple average among Latin American countries.

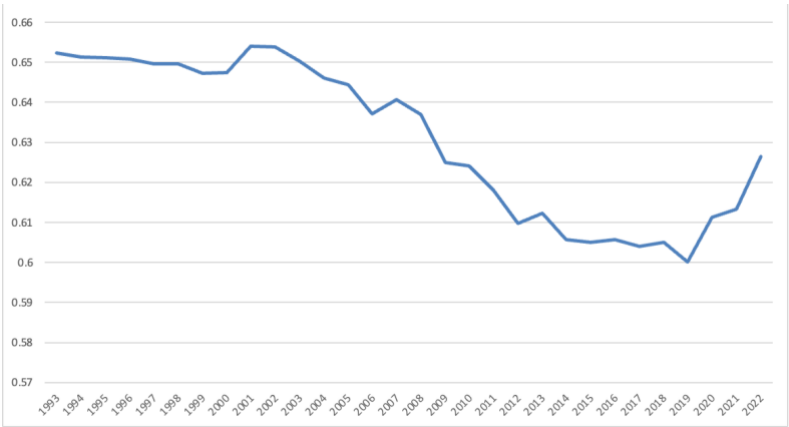

Figure C: Average Gini Coefficient of Latin America
Source: Author's own illustration using data from World Income Inequality DataBase (WIID), calculating the simple average of the Gini coefficient among Latin American countries.

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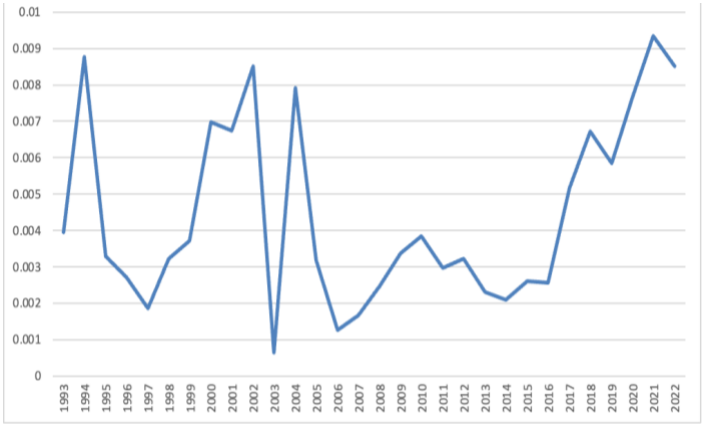

Figure D: Average Conflict Intensity in Latin America

Source: Author's own illustration using disaggregated data from UPSALA, aggregating it and dividing by population and multiplying by 1000 to find conflict-related deaths per 1000 people, then calculating the simple average among Latin American countries.

Notes on Figures

The figures presented in this appendix highlight key regional patterns in remittances, inequality, and conflict, providing important context for the paper's analysis.

- Figures A and B show remittance dynamics. Average remittances per capita increased steadily, reaching record highs by 2023. As a share of GDP, remittances peaked at nearly 6% in 2007 before declining until 2013, then rebounding above 7% by 2023. The 2007 dip likely reflects the impact of the global financial crisis on migrant incomes and transfer flows. In some countries (e.g., El Salvador, Honduras, Guatemala), remittances now exceed 20% of GDP, underscoring their economic significance.
- Figure C traces the average Gini coefficient. While inequality declined over past decades, this reduction was uneven, with fluctuations and a notable increase after 2020. The 2009 change may correspond to the global recession and subsequent redistributive policies in Latin America.
- Figure D depicts conflict intensity. The trend is volatile but rising, especially in the last decade. Conflicts in countries such as Colombia, Venezuela, and El Salvador played a major role in shaping both migration patterns and remittance flows, with consequences for inequality outcomes.

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