

Unveiling the inflation-income inequality paradox: contrasts across advanced and developing economies

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Van Bon Nguyen
*Faculty of Finance, Ho Chi Minh University of Banking (HUB),
Ho Chi Minh, Vietnam*

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Abstract

Purpose – Both income inequality and inflation can lead to social instability. Does inflation impact income inequality differently between advanced and developing countries? This paper delves into this question by analyzing the effects of inflation on income inequality across a sample of 34 advanced countries and 44 developing nations from 2010 to 2023.

Design/methodology/approach – Employing both the two-step system GMM estimator and PMG estimation, the study reveals intriguing insights.

Findings – Firstly, while inflation exacerbates income inequality in advanced countries, it narrows the gap in developing nations. Secondly, economic growth mitigates income inequality in advanced nations but widens it in developing ones. However, infrastructure development increases income inequality in advanced countries but alleviates it in developing ones. Thirdly, trade openness correlates with reduced income inequality across both groups of countries.

Originality/value – So far, no existing studies empirically approve the opposite effects of inflation on income inequality between developing and advanced economies. The findings offer valuable policy insights for governments in advanced and developing nations in the fight against income inequality.

Keywords Inflation, Income inequality, Advanced countries, Developing countries

Paper type Research paper

1. Introduction

In advanced economies, the growing wealth gap is exacerbated by governance systems that disproportionately prioritize the interests of private businesses, primarily serving the wealthy (Alvaredo, 2018; Stiglitz, 2020). Policies and regulations often promote private sector growth, unintentionally deepening economic inequality. Efforts to impose higher taxes on the affluent frequently encounter resistance, driven by concerns over potential impacts on investment, productivity, and job creation within enterprises owned by the wealthy (Alvaredo, 2018; Stiglitz, 2020).

In contrast, governance structures in developing countries often focus on promoting business growth to stimulate job creation and economic development. These governments allocate substantial resources to improving living standards, particularly for lower-income populations (World Bank, 2017). They also frequently intervene in the economy to address disparities and ensure a more equitable distribution of resources (Ivanyna and Salerno, 2021). Such efforts aim to tackle the underlying causes of wealth inequality while fostering inclusive economic progress.

Meanwhile, the issue of inflation remains a topic of significant debate among economists. Some researchers advocate for a controlled increase in inflation, arguing that it can enhance economic functionality and benefit various stakeholders. Others caution against this approach, citing Japan's prolonged economic stagnation over the past decade due to deflationary

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pressures (Yoshino and Taghizadeh Hesary, 2015). At the same time, excessively high inflation poses risks, including heightened living costs for individuals and increased operational expenses for businesses, which can undermine social stability. In particular, inflation often exacerbates income inequality, as its impact disproportionately affects the poor compared to the wealthy (Berisha *et al.*, 2023; Collyer *et al.*, 2019).

Furthermore, attempts to rein in hyperinflation can inadvertently trigger economic recession and spike unemployment rates. Striking the delicate balance between stimulating economic growth and averting runaway inflation requires careful policy formulation and implementation. Notably, Kumhof *et al.* (2015) argue that the relationship between inflation and income inequality arises because inflation benefits the wealthy, who are more likely to own appreciating assets and have more resources to protect their wealth. Conversely, inflation disproportionately harms lower-income households, who face higher costs for essentials and have less ability to adjust to economic changes. As a result, inflation tends to exacerbate income inequality.

Regarding the research topic, the dynamic relationship between inflation and income inequality remains a contentious issue with significant implications for social stability. While much of the existing literature emphasizes how inflation exacerbates income inequality, our study aims to explore potential differences in this relationship between advanced and developing economies. Variations in social structures, stages of economic development, and institutional frameworks may influence how inflation affects income inequality in these distinct groups of countries. By identifying the factors that drive these differences, our research seeks to offer more targeted policy recommendations for governments in both advanced and developing countries to meet the 17 United Nations Sustainable Development Goals. Thus, the central research question is: How does inflation impact income inequality differently across advanced and developing countries?

This paper will answer the above question by applying the two-step system GMM estimator and PMG estimation to study the impact of inflation on income inequality for samples of 34 advanced and 44 developing countries from 2010 to 2023. It makes a novel contribution to the literature in two key ways. First, it addresses a significant research gap by empirically analyzing the distinct effects of inflation on income inequality in advanced versus developing countries, which has been underexplored in prior studies. Second, it introduces a different approach by combining PMG estimation and the two-step system GMM estimator. By integrating these methods, the study aims to deliver a robust and comprehensive analysis, deepening our understanding of the intricate relationship between inflation and income inequality.

In addition to the Introduction in Section 1, the paper has the following structure. Section 2 presents the overview of global inflation and income inequality, while Section 3 is the theoretical background. Section 4 is the empirical equation and data, and Section 5 is the findings. Section 6 is the conclusion.

2. Overview of global income inequality and inflation

2.1 Global income inequality

The World Inequality Report 2022, Chancel *et al.* (2023) highlights global income disparities. The global average annual income is €16,700, but Sub-Saharan Africa earns just 31% of this, and South/Southeast Asia earns 50%. In contrast, Europe and North America exceed the average significantly, with North Americans earning 6–10 times more than those in Sub-Saharan Africa and South/Southeast Asia. East Asians earn about half of what Europeans do. After being adjusted for purchasing power parity, economic gaps are also influenced by work hours: Southeast Asians and Sub-Saharan Africans work 30% more annually than North Americans and Europeans, narrowing hourly income differences by 30%. Wealth disparities are even starker – Sub-Saharan Africans, Latin Americans, and South/Southeast Asians own

just 20–50% of global average wealth, reflecting limited access to capital despite relative efficiency in its use.

The World Inequality Report (2023) examines how national income is distributed among the bottom 50%, middle 40%, and top 10% across regions. The bottom 50% consistently earns 9–20% of national income, representing 40–20% of the average income. South/Southeast Asia, Latin America, Sub-Saharan Africa, and MENA have the lowest shares for the bottom 50% (9–12%), with inequality levels close to the global average.

Globally, income disparity mirrors inequality within regions like Sub-Saharan Africa or Latin America due to dual societies: wealthy elites alongside extreme poverty. Conversely, in Central Asia and Russia, East Asia, and North America, the bottom 50% is relatively less impoverished, with their share of national income around 13%. In Europe, it's 19%.

2.2 Global inflation

The IMF (2023) projects global inflation to fall from 8.7% in 2022 to 6.9% in 2023 and 5.8% in 2024, driven by tighter monetary policies and lower commodity prices. Core inflation is expected to decline gradually, reaching target levels around 2025. Anchoring inflation expectations will require strong monetary policy measures and frameworks.

Before the COVID-19 pandemic in early 2020, inflation expectations in advanced economies were slightly below target levels. Short-term expectations surged significantly after 2021, while long-term expectations have aligned more closely with targets. In contrast, emerging market economies show a wide- and upward-skewed range of short-term expectations, reflecting large variability in recent inflation experiences. Median long-term expectations have risen modestly by ten basis points, with a narrower and slightly higher interquartile range, signaling some upward adjustment but overall stability.

Various metrics, including deviations from targets and dispersion among individual expectations, suggest long-term expectations remain steady despite recent inflationary pressures. This apparent stability likely reflects proactive policy measures but warrants continued vigilance.

3. Theoretical background

3.1 Theoretical framework

Albanesi (2007) puts forth a theoretical framework suggesting that the connection between average inflation and income inequality stems from a conflict over distribution that shapes fiscal policy decisions. Through a monetary model, the analysis demonstrates that in a balanced state, households with lower incomes tend to hold a larger proportion of cash in their purchases, aligning with real-world observations. The political dynamics shaping fiscal and monetary policies are depicted as a bargaining game. When there's no consensus, a scenario emerges where there's a low tax on labor income and a relatively high inflation rate. Given the vulnerability of low-income households to inflation, their bargaining power is diminished. Therefore, inflation is expected to be positive in equilibrium, with greater inequality correlating with higher equilibrium inflation levels. Besides, Zheng *et al.* (2020) construct a theoretical framework to uncover how inflation influences income inequality. By employing a growth model featuring menu costs and variety expansion, their framework highlights that inflation impacts income inequality through both interest rate and asset value channels. The numerical analysis underscores that inflation tends to decrease income inequality.

The impact of inflation on income inequality differs notably between advanced and developing countries, driven by variations in economic structures, market dynamics, and government policies. In most advanced economies, where markets typically operate with minimal state intervention, inflation often exacerbates income inequality. Rising prices for essential goods increase the cost of living, disproportionately affecting lower-income households whose budgets are heavily weighted toward necessities. This erosion of real

income makes it harder for these individuals to maintain their standard of living. Specifically, rising inflation diminishes the purchasing power of low-income individuals and decreases the real value of government assistance, which is often not adjusted for inflation (Yue, 2011; Siami-Namini and Hudson, 2019). At the same time, the management frequently responds to inflation by raising prices to safeguard their profit margins (Fischer and Modigliani, 1978). This strategy not only preserves the wealth of higher-income groups but also intensifies the economic divide, contributing to a higher disparity in overall income distribution.

In contrast, most developing countries, where governments tend to play a more active role in regulating markets, exhibit a different dynamic. When inflation pushes up the prices of commodities, governments often intervene to cushion the blow to lower-income populations (Anderson *et al.*, 2017). Common interventions include subsidies on essential goods, price controls, and targeted welfare programs designed to maintain affordability for the most vulnerable (Bourguignon, 2018). By absorbing or mitigating these inflationary pressures, such policies help stabilize purchasing power and prevent a significant increase in the income gap. In some cases, these measures even narrow the disparity between rich and poor, as state involvement levels the economic playing field to some extent.

3.2 Literature review

For the research topic, most papers find the nonlinear relationship between inflation and income inequality. Some studies note the linear impact of inflation on income inequality.

Recent studies have been conducted regarding the linear relationship. Law and Soon (2020) and Uspri *et al.* (2023) discover that inflation widens income inequality, while Göcen (2023) notes that inflation narrows it. Law and Soon (2020) employ the two-step system GMM estimator for a research sample of 65 developed and developing countries between 1987 and 2014. In particular, Law and Soon (2020) argue that inflation, in theory, can exacerbate income inequality by diminishing the purchasing power of the poor and decreasing the real value of government assistance, which is typically not adjusted for inflation. However, inflation could potentially reduce income inequality if it increases nominal incomes, resulting in higher income taxes paid by the wealthy. Meanwhile, Uspri *et al.* (2023) apply the one-step system and difference GMM estimators for a panel dataset of 58 cities in Indonesia from 2010 through 2020. Similarly, Göcen (2023) uses the pooled OLS regression, fixed effects model, and one-step system and difference GMM estimators for 58 countries from 2012 to 2018.

Regarding the nonlinear relationship, studies consist of Bulír (2001), Nantob (2015), Monnin (2014), Balcilar *et al.* (2018), Siami-Namini and Hudson (2019), and Glawe and Wagner (2024). Bulír (2001) employs the OLS regression and IV estimation for 75 countries from 1970 to 1991. The findings note that lowering inflation from hyperinflationary rates notably reduces income inequality; however, continuing to reduce it to very low levels appears to achieve minimal additional improvements in the Gini coefficient. Meanwhile, Monnin (2014) applies the pooled OLS regression for ten advanced countries between 1971 and 2010. He suggests that Low levels of inflation correlate with increased income inequality. As inflation rises, inequality decreases until it reaches a minimum of approximately 13% inflation, after which it starts to increase once more. Nantob (2015) applies the pooled OLS regression, fixed and random effects models, and one-step system GMM estimator for a sample of 46 developing countries from 2000 to 2012. The results show that increased inflation is linked to greater income inequality. As inflation goes up, so does income inequality, reaching its peak at around 109% inflation before gradually declining once more. Besides, Balcilar *et al.* (2018) employ the semi-parametric instrument variable estimator for a sample of states in the United States between 1976 and 2007. These researchers suggest that a constructive connection is established only when the states surpass a certain threshold of inflation. When the inflation rate falls below this threshold, it reduces income inequality. In addition, Balcilar *et al.* (2018) emphasize that rising inflation can erode the real value of nominal, non-indexed assets and transfers. Poor people are likely unable to shield themselves

from inflation due to barriers to accessing real, indexed financial assets (Easterly and Fischer, 2001). In such cases, inflation tends to increase income inequality (Cysne *et al.*, 2005). However, inflation can also reduce the real value of private debt, which may help decrease income inequality. Besides, Siami-Namini and Hudson (2019) use the fixed and random effects models and VECM for the panel data of 24 advanced and 66 developing countries from 1990 through 2014. The findings show that as the inflation rate increases, income inequality declines to a minimum point, and then begins to go up once more. Notably, Siami-Namini and Hudson (2019) argue that since the time of David Hume (1711–1776), it has been widely accepted that wages tend to lag behind inflation. As a result, one way inflation can contribute to income inequality is by redistributing income from wage earners to profit earners. More recently, Glawe and Wagner (2024) have used the threshold panel data model with GMM-type estimators for a panel dataset of 101 countries between 1985 and 2020. They propose that inflation rates above 6% are linked with increased income inequality, while below this threshold value, the correlation remains insignificant.

4. Empirical equation and data

4.1 Empirical equation

Following Göcen (2023), the empirical equation is re-modified as follows:

$$GIN_{it} = \alpha_0 + \alpha_1 GIN_{it-1} + \alpha_2 INF_{it} + X_{it}\alpha' + \mu_i + \psi_{it} \quad (1)$$

subscript i represents the index for country, while subscript t represents the index for time. GIN_{it} is the Gini index of disposable income from the Standardized World Income Inequality Database (SWIID) developed by Solt (2020) as a measure of income inequality, GIN_{it-1} is the initial value of Gini index of disposable income; INF_{it} is inflation. X_{it} consists of infrastructure, institutional quality, trade openness, and economic growth. μ_i is an unobserved fixed effect and ψ_{it} is an error term. $\alpha_0, \alpha_1, \alpha_2$, etc. are parameters.

Control variables are essential elements of empirical equations, chosen based on extensive research. Economic growth significantly influences income inequality, as demonstrated by Uspri *et al.* (2023), Monnin (2014), Balcilar *et al.* (2018), Nantob (2015), and Glawe and Wagner (2024) incorporating it into their models. Additionally, a nation's trade openness plays a dual role in shaping income distribution. While it can foster trade and cultural exchange, potentially reducing inequality with policies favoring the disadvantaged (Nantob, 2015; Glawe and Wagner, 2024), it can also disproportionately benefit the wealthy, exacerbating inequality (Law and Soon, 2020; Siami-Namini and Hudson, 2019). Institutional quality will regulate the behavior of agents participating in economic activities, so it can increase or decrease income inequality. Göcen (2023) uses it in the empirical model. Furthermore, infrastructure is a critical control variable in empirical analyses. Investments in infrastructure, including roads, seaports, bridges, and utilities, significantly impact societal well-being by enhancing access and economic participation opportunities, potentially reducing income inequality.

We utilize the two-step system GMM estimator (2SGMM) framework to examine the influence of inflation on income inequality across 34 advanced and 44 developing countries from 2010 to 2023. This estimator, endorsed by Judson and Owen (1999), is chosen for its efficacy in addressing four key concerns. Firstly, it addresses potential endogeneity stemming from the bidirectional relationship between institutional quality, economic growth, and trade openness with income inequality. Secondly, it mitigates issues related to unobserved fixed effects within μ_i , which may correlate with certain regressors. Thirdly, it tackles the problem of serial autocorrelation that may arise from including lagged regressors such as GIN_{it-1} . Lastly, it accommodates the panel dataset's characteristic of comprising a relatively large number of countries (44) with a short observation period (14). Traditional panel estimators (random and

fixed-effects models), pooled OLS regression, and IV-2SLS estimators are not utilized due to their potential to introduce bias and inconsistency into estimated coefficients.

Holtz-Eakin *et al.* (1988) were the pioneers of the general method of moments (GMM), which underwent further refinement by Arellano and Bond (1991). They introduced two variants of GMM estimators: the system and the difference. However, the difference GMM estimator suffers from a limitation wherein past values of persistent regressors inadequately inform their changes, thus weakening the lagged instrumental variables. Consequently, the system GMM estimator (SGMM) demonstrates superior performance over the difference GMM estimator (DGMM). Concerning efficiency, the two-step SGMM (2GMM) may be more favorable than the one-step SGMM (1SGMM). However, employing 2SGMM in small research samples, such as ours, poses a challenge (Roodman, 2009), as it results in instrumental increase quadratically with the time dimension, potentially outnumbering panel units. The solution lies in adhering to a rule of thumb: ensuring that the number of panel units exceeds or equals the number of instruments (Roodman, 2009). The research employs statistical tests such as Arellano-Bond and Hansen/Sargan tests to assess the instruments's validity. The Arellano-Bond AR(2) test evaluates the presence of serial autocorrelation within first-order differences of errors, while the Sargan/Hansen tests identify endogenous factors.

To bolster the reliability of 2SGMM estimates, we employ the PMG, pioneered by Pesaran *et al.* (1999). This approach offers a distinct advantage by accommodating fluctuations in short-term coefficients across countries while maintaining coherence in long-term parameters. Furthermore, the PMG estimator leverages the speed of adjustment to tackle the dynamic equilibrium between short-term and long-term dynamics. The empirical model is outlined below:

$$\Delta G_{it} = \phi Z_{it-1} + \sum_{j=1}^p \delta_{it} \Delta H_{it-j} + \tau_i + \psi_{it} \text{ where } Z_{it-1} = G_{it-1} - \theta H_{it-1} \quad (2)$$

Here, G_{it} represents Gini index (income inequality), Z_{it-1} denotes the deviation from the long-run equilibrium at any given period t for country i , and ϕ signifies the speed of adjustment. The vector θ encompasses long-run parameters, reflecting the long-term elasticity of income inequality in response to each variable in H_{it-1} . Concurrently, the vector δ captures short-run dynamics corresponding to H variables. τ_i represents a fixed effect, and ψ_{it} serves as the error term. Notably, for the PMG estimates to be considered reliable, ϕ must be negative and less than 1, affirming the stability of the adjustment process.

4.2 Research data

The dataset covers the Gini index, inflation, real per capita GDP, trade openness, telephone subscriptions, and governance indicators. Except for the Gini index, sourced from SWIID by Solt (2020), we collect data for the other variables from the World Development Indicators (World Bank). The study sample comprises 34 advanced economies [1] and 44 developing countries [2] between 2010 and 2023.

The Appendix includes Tables Ap1, Ap2, Bp1, Bp2, Bp3, and Bp4, providing definitions and descriptive statistics for the dataset. Examination of Tables Bp2 and Bp4 indicates that governance scores are significantly lower in 44 developing economies compared to 34 developed ones. In general, developing economies show weaker governance, while developed ones tend to have stronger governance. This observation aligns with the perspective proposed by Li and Filer (2007), which differentiates developed economies based on rule-based governance (good governance) and developing economies based on relation-based governance (poor governance).

The data provided in Table Cp1 illustrates a positive association between inequality and trade openness, inflation, and infrastructure within advanced economies. Conversely, the results from Table Cp3 for developing economies show a negative link between inequality and infrastructure, trade openness, economic growth, and inflation. In particular, the correlation coefficients among control variables are relatively low (below 0.8), indicating the need to

include all variables in the empirical models. Furthermore, [Tables Cp2](#) and [Cp4](#) indicate high correlation coefficients among different governance dimensions, exceeding 0.8, suggesting collinearity. As a result, the study addresses these concerns by separately incorporating these variables into empirical equations to mitigate multicollinearity.

5. Findings

5.1 2SGMM estimates

[Tables 1](#) and [2](#) note the 2SGMM findings for the study samples comprising advanced and developing economies. Each column in these tables reflects outcomes from a comprehensive model associated with a specific governance dimension. The findings closely align with the direction and significance of the coefficients estimated in the models. During the estimation procedure, we identify inflation as endogenous, thus employing it as an instrument in *GMM* style, while utilizing the remaining regressors as instruments in *IV* style.

The results derived from various empirical models indicate a nuanced nexus among inflation, economic growth, trade openness, infrastructure, institutional quality, and income inequality across distinct country categories. Specifically, inflation widens income inequality in advanced countries while narrowing it in developing ones. Similarly, infrastructure demonstrates divergent effects, exacerbating income disparity in advanced economies while alleviating it in developing counterparts. Economic growth, conversely, acts as a double-edged sword, decreasing income inequality in advanced countries but increasing it in developing economies. Notably, trade openness is a consistent factor in reducing income inequality across both country groups. However, the role of governance complicates matters, as it contributes to income inequality in advanced countries.

The differing effects of inflation on income inequality in advanced and developing economies stem from distinct economic structures and policy responses, which shape the distributional outcomes of inflationary pressures. In most advanced economies, where free-market mechanisms dominate and state intervention is limited, inflation exacerbates existing income inequality. It occurs primarily through two interconnected mechanisms: the erosion of real incomes for lower-income groups and the wealth-consolidating behaviors of businesses.

Table 1. Inflation – income inequality: 2SGMM (34 advanced countries)

Dependent variable: Income inequality (Gini index)						
Variables	GO1	GO2	GO3	GO4	GO5	GO6
Gini (–1)	0.988*** (0.002)	0.988*** (0.002)	0.983*** (0.002)	0.987*** (0.001)	0.988*** (0.002)	0.987*** (0.002)
Inflation	0.034*** (0.006)	0.030*** (0.006)	0.029*** (0.006)	0.029*** (0.006)	0.027*** (0.006)	0.031*** (0.006)
Economic growth	–0.0002** (0.0001)	–0.0002*** (0.0001)	–0.0003*** (0.0001)	–0.0003*** (0.0001)	–0.0003*** (0.0001)	–0.0003*** (0.0001)
Trade openness	–0.0002** (0.0000)	–0.0003*** (0.0000)	–0.0001** (0.0000)	–0.0001** (0.0000)	–0.0004 (0.0001)	–0.0002*** (0.0000)
Infrastructure	0.001*** (0.0002)	0.001*** (0.0002)	0.001*** (0.0003)	0.001*** (0.0002)	0.001*** (0.0003)	0.001*** (0.0003)
Governance	0.055*** (0.012)	0.095*** (0.017)	0.103*** (0.018)	0.089*** (0.018)	0.060*** (0.028)	0.080*** (0.019)
Instrument	28	27	27	29	27	28
Country/ Observation	34/408	34/408	34/408	34/408	34/408	34/408
AR(2) test	0.528	0.518	0.512	0.520	0.517	0.529
Sargan test	0.244	0.157	0.194	0.310	0.157	0.173
Hansen test	0.349	0.664	0.742	0.806	0.677	0.624

Note(s): *, **, and *** present the significance level at 10%, 5%, and 1%

Source(s): Author's own work

Table 2. Inflation – income inequality: 2SGMM (44 developing countries)

Dependent variable: Income inequality (Gini index)						
Variables	GO1	GO2	GO3	GO4	GO5	GO6
Gini (–1)	0.978*** (0.002)	0.977*** (0.002)	0.979*** (0.004)	0.978*** (0.002)	0.979*** (0.002)	0.978*** (0.002)
Inflation	–0.002*** (0.0008)	–0.003*** (0.0009)	–0.001*** (0.008)	–0.002*** (0.008)	–0.002*** (0.008)	–0.002*** (0.009)
Economic growth	0.001** (0.0001)	0.001** (0.0001)	0.0009** (0.0002)	0.001** (0.0008)	0.001** (0.0001)	0.001** (0.0001)
Trade openness	–0.001** (0.0004)	–0.001** (0.0004)	–0.0008 (0.0005)	–0.0009** (0.0004)	–0.001** (0.0005)	–0.001** (0.0004)
Infrastructure	–0.0007*** (0.0001)	–0.0006*** (0.0001)	–0.0006*** (0.0002)	–0.0007*** (0.0001)	–0.0006*** (0.0001)	–0.0007*** (0.0001)
Governance	0.001 (0.028)	0.001 (0.028)	0.036 (0.022)	0.011 (0.031)	–0.029 (0.028)	0.006 (0.025)
Instrument	28	28	29	28	28	28
Country/ Observation	44/484	44/484	44/484	44/484	44/484	44/484
AR(2) test	0.275	0.268	0.279	0.277	0.271	0.275
Sargan test	0.831	0.795	0.852	0.839	0.787	0.770
Hansen test	0.641	0.682	0.764	0.612	0.624	0.655
Note(s): *, **, and *** present the significance level at 10%, 5%, and 1%						
Source(s): Author’s own work						

Inflation typically raises the prices of essential goods and services – items that constitute a significant portion of the expenditures for low-income households. As these prices rise, the real purchasing power of lower-income individuals declines, reducing their capacity to maintain their living standards. For the affluent, however, the story is often different. Wealthier individuals typically own businesses or significant assets that benefit from inflationary environments. Businesses pass on higher costs to consumers by increasing prices, which safeguards profit margins (Fischer and Modigliani, 1978) and, in many cases, enhances wealth concentration among owners and shareholders. This interaction creates a widening disparity between the rich and the poor, amplifying income inequality.

In contrast, most developing economies, which often feature active governmental roles in economic regulation, exhibit a more complex relationship between inflation and inequality. When inflation drives up the cost of living, governments in these countries frequently intervene to shield vulnerable populations from the full brunt of these effects. Policies such as subsidies for essential goods, price controls, and welfare programs are designed to maintain affordability for necessary items (Anderson *et al.*, 2017). These measures act as stabilizers, offsetting some of the adverse impacts of inflation on low-income households and mitigating the potential widening of income inequality. For example, subsidies directly reduce the cost burden on essential commodities, benefiting lower-income groups disproportionately (Bourguignon, 2018). Likewise, price controls prevent unchecked price hikes, ensuring that crucial goods remain within reach for poorer populations. While these interventions may strain government budgets and occasionally distort market efficiency, they also help preserve the purchasing power of lower-income households. They can even reduce the income gap between social classes. However, this dynamic is not without challenges. The success of such interventions in developing countries often depends on the capacity of governments to implement and fund them effectively. Inefficient or poorly targeted subsidies, for instance, can lead to resource misallocation or benefit wealthier groups more than intended. Furthermore, in economies where inflation becomes chronic (hyperinflation), even extensive government intervention may struggle to contain its adverse effects on inequality.

It has been found that economic growth, as measured by real GDP per capita, reduces income inequality in advanced economies but exacerbates it in developing ones. This result is consistent with findings in previous papers. [Uspri et al. \(2023\)](#) note the positive impact of economic growth on income inequality, while [Monnin \(2014\)](#) and [Nantob \(2015\)](#) indicate the negative effect of economic growth on income inequality. The notable positive influence of economic growth on income inequality in developing countries implies that sustainable economic advancement in these regions is hindered by insufficient institutional quality. Weak institutional frameworks amplify the consequences of economic growth, exacerbating income inequality. Conversely, the marked negative effect of economic growth on income inequality in advanced nations suggests that strong governance systems alleviate the impact of economic growth, leading to enhanced income equality.

The negative effect of trade openness on income inequality highlights how open economic policies empower individuals from lower-income backgrounds to access global knowledge, expertise, and experiences, enabling them to pursue higher-income prospects. As a result, individuals from disadvantaged backgrounds have numerous opportunities to secure well-paying positions within both domestic and foreign enterprises operating within their country or even to pursue lucrative employment opportunities abroad. This result is similar to the findings in [Nantob \(2015\)](#) and [Glawe and Wagner \(2024\)](#).

Infrastructure development in advanced economies can set up good conditions for the development of the private sector (the rich) by cutting transaction costs of the enterprises to promote investment and production. It leads to widening the income gap. By contrast, infrastructure development in developing countries mainly focuses on improving the living conditions and income of poor people although it also creates good conditions for private enterprises. It results in narrowing the income gap.

In developed countries with rule-based governance ([Li and Filer, 2007](#)), the unrestricted operation of free markets thrives, facilitated by limited government interference. It creates a conducive environment for the expansion of the private sector. As a result, it leads to the accumulation of economic advantages primarily among the affluent, including business leaders, capital holders, and technology innovators. Consequently, it exacerbates the wealth gap between the rich and the poor.

5.2 Robustness check by PMG

The PMG estimator, a form of the panel Error Correction Model (ECM), depends on co-integration. It means that panel co-integration tests, as outlined by [Westerlund \(2007\)](#), have to be carried out. [Tables 3 and 4](#) present the outcomes of these tests for advanced and

Table 3. Westerlund panel co-integration tests (34 advanced countries)

Normalized variable: Income inequality (Gini index)				
Covariates	G_t	G_α	P_t	P_α
Inflation	-7.287***	-20.529***	-15.133***	-12.207***
Economic growth	-3.339***	-9.138***	-13.607***	-7.310***
Trade openness	-3.245***	-19.722***	-17.474***	-15.391***
Infrastructure	-3.432***	-16.690***	-19.569***	-10.780**
Governance 1	-6.319***	-16.715***	-14.619***	-10.770**
Governance 2	-2.941***	-21.966***	-14.020**	-19.579***
Governance 3	-3.054***	-20.604***	-17.157***	-18.868***
Governance 4	-2.644***	-16.915***	-15.979***	-11.338***
Governance 5	-3.702***	-17.237***	-15.845***	-15.255***
Governance 6	-3.379***	-22.317***	-14.721***	-17.244***

Note(s): *, **, and *** present the significance level at 10%, 5%, and 1%

Source(s): Author's own work

Table 4. Westerlund panel co-integration tests (44 developing countries)

Normalized variable: Income inequality (Gini index)				
Covariates	G_t	G_α	P_t	P_α
Inflation	-3.486***	-14.979***	-16.048***	-22.429***
Economic growth	-2.984***	-5.749***	-17.091***	-12.824***
Trade openness	-2.320***	-7.786***	-12.418***	-6.299***
Infrastructure	-4.847***	-9.595***	-15.769***	-11.510***
Governance 1	-4.231***	-17.577***	-16.668***	-23.744***
Governance 2	-3.975***	-18.995***	-13.357***	-14.994***
Governance 3	-2.574***	-9.980***	-16.894***	-10.485***
Governance 4	-3.431***	-19.071***	-22.624***	-15.545***
Governance 5	-3.319***	-16.537***	-17.123***	-10.639***
Governance 6	-2.188***	-8.522***	-13.145***	-6.028***

Note(s): *, **, and *** present the significance level at 10%, 5%, and 1%
Source(s): Author's own work

developing economies. Variables like institutional quality, inflation, trade openness, economic growth, and infrastructure show co-integration with income inequality in both groups of countries.

Tables 5 and 6 offer valuable insights into the PMG estimations. In particular, the error-correction coefficients emphasized at the bottom of the tables, highlight the strength and reliability of the PMG estimations. Consistent with the findings of 2SGMM, in developed nations, inflation exacerbates income inequality, whereas in developing ones, it alleviates it. Additionally, economic growth reduces income inequality in developed countries but increases it in developing ones. However, advancements in infrastructure widen income inequality in developed economies while reducing it in developing ones. Lastly, trade openness diminishes income inequality in both sets of countries.

Table 5. Inflation – income inequality: PMG (34 advanced countries)

Long run co-integrating vectors						
Dependent variable: Income inequality (Gini index)						
Variables	GO1	GO2	GO3	GO4	GO5	GO6
Inflation	0.126*** (0.017)	0.283*** (0.054)	0.243*** (0.001)	0.613*** (0.033)	0.039*** (0.010)	0.454*** (0.037)
Economic growth	-0.023*** (0.008)	-0.07*** (0.014)	-0.035*** (0.0002)	-0.041*** (0.004)	-0.025*** (0.005)	-0.026*** (0.008)
Trade openness	-0.030*** (0.004)	-0.040*** (0.010)	-0.009*** (0.0005)	-0.060*** (0.004)	-0.054*** (0.002)	-0.018*** (0.005)
Infrastructure	0.010*** (0.004)	0.188*** (0.29)	0.035*** (0.0001)	0.021*** (0.002)	0.015*** (0.001)	0.034*** (0.006)
Governance	3.025*** (0.209)	0.152*** (0.384)	0.054*** (0.011)	1.382*** (0.070)	2.034*** (0.274)	0.066*** (0.176)
Error correction	-0.251***	-0.073**	-0.213***	-0.174***	-0.130***	-0.200***
Observation	442	442	442	442	442	442
Log likelihood	414.958	418.292	414.194	466.748	458.057	444.279

Note(s): *, **, and *** present the significance level at 10%, 5%, and 1%
Source(s): Author's own work

Table 6. Inflation – income inequality: PMG (44 developing countries)

Long run co-integrating vectors						
Dependent variable: Income inequality (Gini index)						
Variables	GO1	GO2	GO3	GO4	GO5	GO6
Inflation	−0.009*** (0.006)	−0.238*** (0.029)	−0.191*** (0.020)	−0.318*** (0.029)	−0.069*** (0.017)	−0.185*** (0.017)
Economic growth	0.012*** (0.008)	0.110*** (0.007)	0.094*** (0.010)	0.130*** (0.019)	0.076*** (0.013)	0.120*** (0.017)
Trade openness	−0.076*** (0.012)	−0.015*** (0.003)	−0.121*** (0.011)	−0.010** (0.004)	−0.023*** (0.009)	−0.032*** (0.007)
Infrastructure	−0.007** (0.003)	−0.004*** (0.001)	−0.006*** (0.001)	−0.029*** (0.005)	−0.050*** (0.007)	−0.038*** (0.010)
Governance	−2.740*** (0.494)	1.748 (0.174)	−1.745*** (0.177)	−5.702*** (0.775)	0.334 (0.728)	−1.081*** (0.292)
Error correction	−0.052**	−0.025***	−0.048***	−0.024***	−0.046***	−0.015***
Observation	572	572	572	572	572	572
Log likelihood	609.376	642.398	572.520	603.923	600.473	631.123

Note(s): *, **, and *** present the significance level at 10%, 5%, and 1%

Source(s): Author's own work

6. Conclusion

Stemming from the fact that both inflation and income inequality are serious challenges facing both advanced and developing countries because these measures can lead to social instability, this paper applies 2SGMM and PMG to explore the different impacts of inflation on income inequality between research samples of 34 advanced and 44 developing countries from 2010 to 2023. The research unveils fascinating observations. First, inflation worsens income inequality in developed nations but lessens it in developing ones. Second, economic growth diminishes income inequality in developed countries but exacerbates it in developing ones. Nonetheless, infrastructure advancement amplifies income inequality in developed economies while easing it in developing ones. Third, trade openness decreases income inequality in both groups of countries.

The findings of this study underscore several critical implications for both advanced and developing countries. Governments in advanced countries should establish and rigorously maintain a low inflation target to mitigate the exacerbation of income inequality. Conversely, developing nations should exercise caution when employing inflation to address income inequality, as excessive inflation can precipitate social unrest. Instead, they should meticulously define an inflation target tailored to their economic landscape, ensuring that inflation remains moderate and stays within the designated threshold. In particular, the relationship between inflation and income inequality in developing countries presents significant challenges. The efficacy of policy interventions often rests on the government's capacity to design, implement, and sustain them with precision. Misaligned or inadequately targeted subsidies can exacerbate resource misallocation, undermining their intent and, paradoxically, advantaging wealthier segments of the population. In economies grappling with chronic inflation or hyperinflation, the challenge deepens; even comprehensive government actions may prove insufficient to counter the systemic and far-reaching repercussions of inflation on social and economic disparities. It underscores the intricate balance required to address inequality under persistent inflationary pressures.

Institutional quality is employed as a control variable in the empirical models in this study. Future research should consider its role in the inflation–income inequality relationship for samples of advanced and developing economies because it significantly affects both inflation and income inequality as proposed by recent papers. Furthermore, digital technology and the

development of financial markets based on digital platforms are becoming increasingly prominent. Future studies should explore their mediating role in the inflation-income inequality nexus. In particular, the dynamic CEE (Common Correlated Effects) and CS-ARDL (Cross-Sectional Autoregressive Distributed Lag) have emerged as more powerful methodologies, so future researchers should apply them in estimation.

Notes

1. "Australia, Austria, Belgium, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Korea, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and United States."
2. "Albania, Argentina, Armenia, Bangladesh, Belarus, Bhutan, Bolivia, Brazil, Bulgaria, Central African Republic, Chile, China, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Gambia, Georgia, Honduras, Hungary, India, Indonesia, Kazakhstan, Kenya, Kyrgyzstan, Mali, Mexico, Moldova, Montenegro, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russia, Serbia, Thailand, Turkey, Uganda, Ukraine, Uruguay, and Vietnam."

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Supplementary material

The supplementary material for this article can be found online.

Corresponding author

Van Bon Nguyen can be contacted at: bonnv@hub.edu.vn, boninguyen@gmail.com