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The mediating contribution of institutional quality to the inflation - income inequality relationship in advanced countries

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Abstract
Both income inequality and inflation are potential sources of social instability, and the existing literature highlights a link between them. Does institutional quality contribute to shaping this relationship? This study examines how inflation, institutional quality, and their interaction influence income inequality in a panel of 34 advanced economies over the 2008-2023 period, employing both one-step and two-step system GMM estimators. The findings reveal that while inflation and institutional quality exacerbate income inequality, their interaction has a mitigating effect. In addition, trade openness and economic growth reduce income inequality, whereas infrastructure increases it. These results offer crucial insights, suggesting that enhancing institutional quality can help advanced economies manage inflation more effectively and narrow income inequality.

Keywords: Advanced countries, Income inequality, Inflation, Institutional quality, GMM estimator

JEL code: C23, D31, E31

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1. Introduction

In several advanced economies, the persistent expansion of income inequality is closely tied to institutional frameworks that systematically prioritize the interests of private enterprises and, consequently, the affluent elite (Stiglitz, 2020; Alvaredo, 2018). While policy initiatives often aim to bolster private sector development, they can inadvertently magnify socio-economic divides. Efforts to implement higher tax rates on top earners are frequently met with resistance, mainly rooted in fears that such measures might dampen investment, curtail productivity, and threaten employment within wealth-concentrated industries (Alvaredo, 2018; Stiglitz, 2020). Meanwhile, the dynamics and implications of inflation continue to provoke divergent interpretations and debates within economics. While some argue that moderate inflation can enhance economic performance and support broad-based growth, others warn of the dangers, pointing to Japan's prolonged stagnation caused by persistent deflation (Yoshino & Taghizadeh Hesary, 2015). Meanwhile, high inflation can destabilize economies by increasing living costs for families and raising operational expenses for businesses. Moreover, inflation exacerbates income inequality, disproportionately burdening low-income groups compared to the wealthy (Collyer et al., 2019; Berisha et al., 2023).

Attempts to curb hyperinflation can unintentionally trigger economic downturns, often accompanied by increased unemployment. Designing appropriate policy interventions demands a

balance between fostering sustainable economic expansion and preventing unchecked inflationary pressures. As Kumhof et al. (2015) argue, inflation often amplifies income inequality, primarily because it disproportionately advantages the wealthy - who are more likely to hold inflation-resistant assets and possess the financial acumen and resources to shield their capital from devaluation. In contrast, lower-income households are disproportionately affected, as they face rising costs for necessities and have limited capacity to adapt to shifting economic conditions. Consequently, inflation often deepens existing income disparities.

The World Inequality Report 2022 underscores significant global income disparities (Chancel et al., 2023). Although the worldwide average income stands at €16,700/year, the earnings in Sub-Saharan Africa amount to just 31% of that figure. Meanwhile, Southeast and South Asia receive approximately half the global average. In stark contrast, the income levels in Europe and North America significantly surpass this benchmark. North Americans, in particular, make between six and ten times more than the average person in Sub-Saharan Africa or South/Southeast Asia. In comparison, East Asians typically earn about half of what Europeans do. When adjusted for purchasing power parity, differences in work hours further influence income comparisons: Sub-Saharan Africans and Southeast Asians work approximately 30% more hours annually than their North American and European counterparts, which narrows hourly income gaps by about 30%. Wealth inequality is even more pronounced. Populations in Sub-Saharan Africa, Latin America, and South/Southeast Asia possess just 20-50% of the global average wealth, underscoring limited access to capital even in contexts where available resources are often utilized with relative efficiency.

The World Inequality Report 2023 examines income distribution across regions by categorizing populations into the bottom 50%, middle 40%, and top 10% income groups. It finds that the bottom half of the population generally captures just 9-20% of national income - translating to merely 20-40% of the average income level. Global inequality patterns are reflected within Sub-Saharan Africa and Latin America, where deep divides exist between affluent elites and widespread poverty. In contrast, regions such as East Asia, Central Asia and Russia, and North America show a relatively less impoverished bottom 50%, with this group earning around 13% of national income. Europe fares better, with the bottom half capturing 19% of national income.

Meanwhile, the IMF (2023) projects a global inflation decline from 8.7% in 2022 to 6.9% in 2023, with a further decrease to 5.8% anticipated in 2024. This downward trend is mainly attributed to tighter monetary policy and a softening of commodity prices. Core inflation is expected to realign with target levels by approximately 2025. The durability of anchored inflation expectations will hinge on the credibility and consistency of monetary policy and the robustness of institutional frameworks. Before the COVID-19 outbreak in early 2020, inflation expectations in advanced economies were slightly below target; however, since 2021, short-term expectations have surged, while long-term expectations have remained more closely tethered to central bank objectives. Indicators such as target deviations and the dispersion of individual forecasts suggest that long-term expectations have remained stable despite recent inflationary pressures - likely due to timely policy interventions. Nevertheless, continued policy vigilance is essential.

Given the research topic, the inflation-income inequality nexus remains a complex and debated issue with important implications for social stability. Building on studies such as Law & Soon (2020) and Göcen (2024), this paper explores the mediating role of institutional quality in the inflation-income inequality nexus. However, our approach differs in two key ways. First, unlike previous research that employs a mixed sample of developed and developing countries, we focus exclusively on a homogeneous group of advanced economies. This allows for more targeted policy insights

tailored to the unique socioeconomic structures of developed nations. Second, we adopt six governance indicators from the World Bank as proxies for institutional quality. Law & Soon (2020) use five ICRG sub-indicators, and Göcen (2024) relies on the Corruption Perceptions Index and the Economic Freedom Index. Based on this framework, we pose the central research question: Does institutional quality mediate the inflation-income inequality nexus in advanced economies? To address this, we apply the two-step system GMM estimators to assess the impact of inflation, institutional quality, and their interaction on income inequality across 34 advanced economies between 2008 and 2023.

The rest of the paper is organized into four sections. Section 2 reviews the theoretical foundations underpinning the analysis. Section 3 outlines the empirical methodology and the data employed in the study. Section 4 presents and interprets the empirical findings. Finally, Section 5 summarizes the main conclusions and highlights the study's implications.

2. Theoretical framework and literature review

2.1. Theoretical framework

Albanesi (2007) develops a theoretical model proposing that the link between average inflation and income inequality arises from distributional conflicts that influence fiscal policy choices. The study shows that in equilibrium, lower-income households typically rely more heavily on cash for transactions through a monetary framework, consistent with empirical evidence. Fiscal and monetary policy decisions are modeled as outcomes of a bargaining process. Without consensus among policymakers, the resulting policy configuration combines low taxes on labor income with comparatively elevated inflation rates. This dynamic disproportionately affects low-income households who are more vulnerable to rising prices. Due to their weaker bargaining position, inflation emerges as a persistent feature of the economic equilibrium, with greater income inequality correlating with higher inflation. Building on this perspective, Zheng et al. (2020) propose a theoretical framework that elucidates the channels through which inflation affects income inequality. Within a growth model that incorporates menu costs and expanding product variety, they highlight how inflation alters inequality primarily through changes in interest rates and asset valuations. Their quantitative findings indicate that, on balance, inflation may act to reduce income inequality.

Inflation exacerbates income inequality in many advanced economies characterized by limited state intervention. As the prices of essential goods and services rise, the cost of living climbs, placing a disproportionate burden on low-income households, which allocate a higher share of their earnings to fundamental necessities. This erosion of real income undermines their ability to maintain an adequate standard of living. Notably, inflation weakens the purchasing power of lower-income groups and devalues government assistance programs, which often fail to adjust fully in line with rising prices (Siami-Namini & Hudson, 2019; Yue, 2011). In contrast, businesses typically respond to inflation by raising prices to safeguard profit margins (Fischer & Modigliani, 1978), enabling wealthier individuals and corporate stakeholders to preserve or enhance their economic positions. This asymmetric impact contributes to a widening income divide and reinforces structural inequalities.

Meanwhile, according to Li & Filer (2007), developed countries have rule-based governance (good institutional quality). The good institutional structure enables free markets to operate with minimal government interference, fostering an environment favorable to private sector growth. This

dynamic often results in the concentration of economic benefits among the wealthy - such as business executives, capital owners, and technological innovators. Over time, this concentration contributes to a widening wealth gap between high- and low-income groups.

Notably, Law & Soon (2020) argue that good institutional quality - characterized by rule-based governance in advanced economies - can mitigate the adverse impact of inflation on income inequality. Governments characterized by strong institutional quality are more likely to adopt inclusive economic policies and implement equitable income distribution measures that help mitigate the adverse effects of inflation. It, in turn, helps curb rent-seeking behavior, which disproportionately harms low-income groups. Similarly, Law et al. (2014) emphasize that robust institutions can offer judicial protection for the poor, limit the undue advantages enjoyed by groups with privileged access to financial resources, and promote a more efficient and productive allocation of those resources.

2.2. Literature review

Within the scope of this research, the prevailing literature suggests a predominantly nonlinear relationship between inflation and income inequality, though several studies also acknowledge linear associations. Recent empirical efforts have increasingly concentrated on exploring this linear dimension. For instance, Uspri et al. (2023) utilize the one-step system and difference GMM estimators on panel data from 58 Indonesian cities between 2010 and 2020, concluding that inflation significantly exacerbates income inequality. Similarly, Sintos (2023) conducts a meta-regression analysis incorporating 1,767 estimates from 124 published studies on the inflation-inequality nexus. The results reveal that inflation generally exerts a small to moderate upward pressure on inequality, as evidenced by both level and difference-based estimations.

Several studies support a nonlinear relationship between inflation and income inequality, including those by Bulíř (2001), Monnin (2014), Nantob (2015), Glawe & Wagner (2024), Siami-Namini & Hudson (2019), and Balcilar et al. (2018). Bulíř (2001), using OLS regression and instrumental variable estimation on data from 75 countries spanning 1970-1991, finds that reducing hyperinflation lowers income inequality. However, pushing inflation to very low levels yields only marginal gains in reducing the Gini coefficient. Similarly, Monnin (2014), applying pooled OLS regression to ten advanced economies from 1971 to 2010, observes a U-shaped relationship: at low inflation levels, inequality rises; as inflation increases, inequality falls until reaching a minimum at 13%, after which it begins to rise again.

Nantob (2015) analyzes 46 developing countries between 2000 and 2012 using the fixed and random effects models, pooled OLS regression, and one-step system GMM estimators. His findings indicate a nonlinear pattern where income inequality increases with inflation, peaking at around 109%, and then gradually decreasing thereafter. Balcilar et al. (2018) apply a semi-parametric instrumental variable estimator to data from U.S. states between 1976 and 2007. They find that inflation reduces inequality below a certain threshold, but beyond that point, inflation exacerbates inequality. They argue that higher inflation reduces the purchasing power of nominal, non-indexed assets and transfer payments, disproportionately affecting low-income households that typically have limited access to real or inflation-protected financial assets (Easterly & Fischer, 2001). As a result, inflation can exacerbate income inequality (Cysne et al., 2005). On the other hand, inflation may reduce the real burden of private debt, potentially narrowing inequality.

Siami-Namini & Hudson (2019) analyze data from a panel comprising 24 advanced and 66 developing economies over the period 1990-2014, employing both fixed and random effects models alongside a VECM to study the inflation - income inequality nexus. Their results also reveal a nonlinear relationship, where rising inflation initially reduces inequality until a turning point, after which further inflation increases it. They also highlight the long-standing view, dating back to David Hume (1711-1776), that wages typically lag behind inflation, causing a redistribution of income from wage earners to profit earners.

More recently, Glawe & Wagner (2024) utilized a threshold panel model incorporating GMM-type estimators to examine data from 101 countries from 1985 through 2020. Their results indicate that inflation is positively and significantly associated with income inequality only when the inflation rate exceeds the 6% threshold. In contrast, the relationship becomes statistically insignificant at inflation rates below this level. Notably, Rosyadi et al. (2026) indicate that inflation increases income inequality in Indonesia by applying the panel VECM model across 33 Indonesian provinces over 2011-2024.

Unlike the studies reviewed above, Law & Soon (2020) and Göcen (2024) focus on the moderating role of institutional quality in the relationship between inflation and income inequality. Law & Soon (2020) apply a two-step system GMM estimator to a dataset comprising 65 developing and developed countries from 1987 to 2014. Their analysis finds that inflation and weak institutional frameworks are individually associated with rising income inequality; however, the interaction between these factors appears to exert an equalizing effect, mitigating inequality. Göcen (2024), on the other hand, employs pooled OLS, fixed effects models, and two-step difference and system GMM estimators using data from 58 countries covering the years 2012 to 2018. His findings suggest that inflation, in isolation, tends to reduce income inequality, while improvements in institutional quality - particularly in terms of reduced corruption and enhanced economic freedom - can offset this effect, leading to greater inequality. Furthermore, high inflation weakens the capacity of strong institutions to reduce income inequality, underscoring the complex interplay between macroeconomic conditions and governance structures.

3. Methodology

3.1. Empirical equation

Following Law & Soon (2020), the study proposes the empirical equation as follows:

$$GIN_{it} = \beta_0 + \beta_1 GIN_{it-1} + \beta_2 INF_{it} + \beta_3 GOV_{it} + \beta_4 (INF \times GO)_{it} + X_{it}\beta' + \eta_i + \zeta_{it} \quad (1)$$

The subscript i denotes the country index, and t indicates the time index. GINit refers to the Gini index of disposable income, serving as an indicator of income inequality. GINit-1 represents the initial (lagged) value of the Gini index of disposable income. INFit is inflation; GOVit is one of six governance indicators, proxy for institutional quality; (INF*GOV)it is the interaction between inflation and institutional quality. Xit includes trade openness, infrastructure, and economic growth. ηi is a fixed effect, and ζit is an error term. β0, β1, β2, etc. are parameters.

Control variables are vital components in empirical models selected through the literature review. Economic growth is widely recognized as a key factor affecting income inequality, as evidenced by its inclusion in the models of Glawe & Wagner (2024), Balcilar et al. (2018), Uspri et al. (2023),

Monnin (2014), and Nantob (2015). Trade openness is another variable with a complex influence on income distribution. On the one hand, globalization can facilitate trade expansion and cultural exchange, which may contribute to reducing income inequality when supported by inclusive economic and social policies (Nantob, 2015; Glawe & Wagner, 2024). On the other hand, it may intensify inequality by primarily benefiting higher-income groups (Law & Soon, 2020; Siami-Namini & Hudson, 2019). Infrastructure development also plays a crucial role as a control variable. Investments in transportation, utilities, and related facilities improve access and participation in economic activities, reducing income inequality.

This study employs the two-step and one-step system GMM estimators (2SGMM and 1SGMM) to analyze the mediating role of institutional quality in the inflation-income inequality relationship across 34 advanced economies between 2008 and 2023. Following the recommendation of Judson & Owen (1999), the system GMM estimator is selected for its robustness in addressing four key econometric challenges. First, it effectively manages endogeneity concerns arising from the possible bidirectional relationships between income inequality and variables such as institutional quality, trade openness, and economic growth. Second, it controls for unobserved country-specific effects (ηi), which may be correlated with the regressors. Third, it accounts for potential serial correlation introduced by lagged variables like GINit-1. Lastly, it is well-suited to the panel structure of the data, characterized by a relatively large cross-section (34 countries) and a short time (16 years). Alternative methods - such as fixed-effects, random-effects models, pooled OLS, and IV-2SLS - are not applied due to their susceptibility to bias and inconsistency in dynamic panel settings.

Holtz-Eakin et al. (1988) pioneered the application of the General Method of Moments (GMM), which was later refined by Arellano & Bond (1991), who introduced two variants: difference GMM and system GMM. While difference GMM relies on using past values of variables as instruments, it often performs poorly when regressors are highly persistent, as lagged levels offer weak instruments for changes. In contrast, the system GMM estimator (SGMM) improves efficiency by combining equations in levels and first differences, making it more robust in such contexts. Among the SGMM variants, the two-step estimator (2SGMM) can offer greater efficiency than the one-step version (1SGMM). However, for relatively small samples such as the one considered in this study, the 2SGMM estimator may suffer from the problem of instrument proliferation. This issue arises because the number of instruments can grow quadratically with the time dimension and potentially exceed the number of cross-sectional units, leading to unreliable estimation results (Roodman, 2009). To mitigate this concern, the number of instruments should be restricted to remain below the number of panel units. The validity of the selected instruments is then examined through standard specification tests. In particular, the Arellano-Bond AR(2) test is applied to identify second-order serial correlation in the residuals, while the Sargan and Hansen tests are used to evaluate the validity and exogeneity of the instruments.

3.2. Research data

The dataset includes information on the Gini index, telephone subscription rates, real GDP per capita, inflation, governance indicators, and trade openness. While the Gini index is sourced from Solt's (2020) Standardized World Income Inequality Database (SWIID), all other variables are drawn from the World Bank's World Development Indicators. The study focuses on a research sample of 34 advanced economies[1] from 2008 to 2023.

[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,

The Appendix contains Tables A1 through A6, which provide variable definitions and descriptive statistics of the data. Table A4 shows that governance scores are positive, indicating that developed countries tend to exhibit strong governance. This result supports the argument by Li & Filer (2007) that advanced economies typically feature rule-based (good) governance. Meanwhile, Table A5 reveals a positive relationship between income inequality, trade openness, and infrastructure. Additionally, the correlation coefficients among the control variables are relatively low (below 0.8), justifying the inclusion of all variables in the empirical models. However, Table A6 shows that different governance indicators are highly correlated - with coefficients exceeding 0.8 - pointing to potential multicollinearity. The study incorporates governance dimensions separately in the empirical models to address this issue.

4. Findings

4.1. 2SGMM estimates

Table 1 displays the baseline regression results without the interaction between inflation and institutional quality, whereas Table 2 shows the complete model outcomes that include this interaction. Each column corresponds to results derived from a comprehensive model focused on a particular aspect of governance. The estimated coefficients largely confirm the expected direction and statistical significance. We detect inflation endogeneity in the estimation process, so the paper uses it as an instrumented regressor in GMM style and the other explanatory variables as instruments in IV style.

New Zealand, Norway, Portugal, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and the United States."

Table 1 - Inflation, institutional quality, and income inequality: 2SGMM (Baseline regression)

Dependent variable: Income inequality (Gini index)						
Variables	GO1	GO2	GO3	GO4	GO5	GO6
Gini (-1)	0.978***	0.981***	0.977***	0.981***	0.986***	0.982***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Inflation	0.029***	0.022***	0.030***	0.027***	0.026***	0.031***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)
Institutional quality	0.071***	0.103***	0.051***	0.086***	0.162***	0.150***
	(0.011)	(0.016)	(0.014)	(0.016)	(0.036)	(0.021)
Economic growth	-0.0003***	-0.0002***	-0.0002***	-0.0002***	-0.0006***	-0.0003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trade openness	-0.0002***	-0.0004***	-0.0003***	-0.0003***	-0.0001	-0.0002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Infrastructure	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Instrument	32	31	31	33	31	32
Country/Observation	34/476	34/476	34/476	34/476	34/476	34/476
AR(2) test	0.954	0.911	0.970	0.952	0.910	0.996
Sargan test	0.704	0.518	0.830	0.458	0.611	0.903
Hansen test	0.495	0.227	0.442	0.555	0.474	0.595

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

Table 2 - Inflation, institutional quality, and income inequality: 2SGMM (Full regression)

Dependent variable: Income inequality (Gini index)						
Variables	GO1	GO2	GO3	GO4	GO5	GO6
Gini (-1)	0.980***	0.984***	0.979***	0.983***	0.985***	0.979***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Inflation	0.048***	0.094***	0.047***	0.112***	0.094***	0.107***
	(0.007)	(0.016)	(0.0010)	(0.028)	(0.018)	(0.033)
Institutional quality	0.107***	0.270***	0.101***	0.219***	0.190***	0.188***
	(0.018)	(0.049)	(0.023)	(0.046)	(0.046)	(0.049)
Ins. quality*Inflation	-0.020***	-0.079***	-0.017***	-0.063***	-0.060***	-0.072***
	(0.006)	(0.018)	(0.007)	(0.022)	(0.016)	(0.027)
Economic growth	-0.0002***	-0.0002**	-0.0002***	-0.0004***	-0.0002*	-0.0002***
	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0000)
Trade openness	-0.0002**	-0.0005***	-0.0003***	-0.0001	-0.0002***	-0.0002**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0001)
Infrastructure	0.002***	0.001***	0.002***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Instrument	34	32	33	32	34	34
Country/Observation	34/476	34/476	33/476	34/476	34/476	34/476
AR(2) test	0.977	0.941	0.970	0.826	0.814	0.988
Sargan test	0.485	0.776	0.593	0.913	0.613	0.422
Hansen test	0.459	0.452	0.536	0.577	0.557	0.307

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

Without the interaction term, the results in Table 1 consistently show that both inflation and institutional quality exacerbate income inequality. With its presence, the individual effects of inflation and institutional quality remain, but their interaction reduces income inequality. It leads to the key conclusion that inflation increases income inequality, and this relationship is mitigated by institutional quality. In addition, the findings indicate that economic growth and trade openness help narrow income inequality, whereas infrastructure widens it.

In advanced economies, the impact of inflation on income inequality is shaped by underlying economic structures and policy choices. These factors influence how inflation affects different segments of the population. In most developed economies - where market forces largely dictate economic activity and government intervention is relatively minimal- inflation intensifies pre-existing income disparities. It occurs mainly through two related channels: the decline in real income for lower earners and the wealth-enhancing strategies of businesses. Inflation often drives up the cost of essential goods and services, which make up a large share of spending for low-income households. As prices increase, the purchasing power of these groups diminishes, making it harder for them to sustain their standard of living. By contrast, wealthier individuals are often better positioned during inflationary periods, as they typically hold assets or businesses that can benefit from rising prices. Companies pass on increased costs to consumers, preserving or boosting profits (Fischer & Modigliani, 1978), leading to high wealth accumulation for business owners and investors. As a result, the gap between high- and low-income groups tends to widen, deepening income inequality.

At the same time, advanced economies typically operate under rule-based governance systems characterized by good institutional quality (Li & Filer, 2007). These robust institutions support the

functioning of free markets with limited state intervention, creating conditions conducive to private sector development. As a result, economic advantages often accumulate among affluent groups - such as corporate leaders, capital investors, and tech innovators. Over time, this accumulation intensifies the disparity between high- and low-income populations. Thus, in developed countries, institutional quality exacerbates income inequality. This finding does not endorse the result by Basumatary& Das (2024) for a group of BRICS countries.

However, the interaction term between inflation and institutional quality reduces income inequality. According to Law and Soon (2020), good institutional quality - marked by rule-based governance in developed nations - can help lessen the adverse effects of inflation on income inequality. In such settings, governments are more likely to adopt inclusive economic strategies and fair income distribution policies that cushion lower-income populations from inflationary pressures. This institutional strength also plays a role in reducing rent-seeking practices that tend to disadvantage poor people. Likewise, Law et al. (2014) highlight that sound institutions can provide legal protection for disadvantaged groups, restrict the excessive benefits often gained by those with privileged financial access, and support a more effective and equitable distribution of resources.

Empirical evidence indicates that economic growth, as measured by increases in real GDP per capita, contributes to reducing income inequality in advanced economies, consistent with the findings of Monnin (2014) and Nantob (2015). The significant negative association between economic growth and income inequality suggests that strong governance frameworks play an important role in ensuring a more equitable distribution of the gains generated by economic development. Similarly, the negative association between trade openness and income inequality suggests that liberal trade policies enhance access for lower-income individuals to global knowledge, skills, and opportunities, enabling them to improve their earning potential. Consequently, people from disadvantaged groups are more likely to secure well-paid jobs within domestic and international companies or pursue attractive employment abroad. This finding is consistent with Nantob (2015) and Glawe & Wagner (2024). In contrast, infrastructure development in advanced economies may primarily benefit the private sector - particularly wealthier individuals - by reducing transaction costs for businesses and encouraging investment and production. This dynamic can contribute to a widening income gap.

4.2. Robustness check by 1SGMM

The study employs the 1SGMM estimator to assess the robustness of the two-step system GMM (2SGMM) results. The corresponding estimates are reported in Table 3, which follows the same structure as Table 2, except that the Hansen test results are omitted. Overall, the 1SGMM findings are consistent with those obtained from the 2SGMM estimator. Specifically, inflation and institutional quality are each associated with higher income inequality, whereas their interaction exerts an inequality-reducing effect. In addition, the results indicate that trade openness and economic growth contribute to lower income inequality, while improvements in infrastructure are associated with greater income inequality.

Table 3 - Inflation, institutional quality, and income inequality: 1SGMM (Full regression)

Dependent variable: Income inequality (Gini index)						
Variables	GO1	GO2	GO3	GO4	GO5	GO6
Gini (-1)	0.981***	0.983***	0.979***	0.984***	0.990***	0.980***
	(0.003)	(0.004)	(0.003)	(0.004)	(0.005)	(0.003)
Inflation	0.066***	0.087***	0.059***	0.115***	0.103***	0.108**
	(0.020)	(0.027)	(0.016)	(0.038)	(0.038)	(0.049)
Institutional quality	0.163***	0.240***	0.211***	0.270***	0.360***	0.231***
	(0.048)	(0.071)	(0.057)	(0.071)	(0.113)	(0.086)
Ins. quality*Inflation	-0.040**	-0.070***	-0.032**	-0.074***	-0.075**	-0.073*
	(0.019)	(0.027)	(0.016)	(0.030)	(0.035)	(0.042)
Economic growth	-0.0003*	-0.0002	-0.0003*	-0.0004**	-0.0005**	-0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
Trade openness	-0.0003**	-0.0005***	-0.0004***	-0.0003**	-0.0000	-0.0003**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Infrastructure	0.001***	0.001**	0.002***	0.001***	0.001*	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Instrument	33	32	34	33	33	34
Country/Observation	34/476	34/476	34/476	34/476	34/476	34/476
AR(2) test	0.755	0.900	0.955	0.606	0.560	0.946
Sargan test	0.821	0.776	0.739	0.922	0.908	0.516

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

5. Conclusion

Recognizing that both inflation and income inequality pose significant challenges to advanced economies - mainly due to their potential to trigger social instability - this study employs 1SGMM and 2SGMM methods to examine the effects of inflation, institutional quality, and their interaction on income inequality across 34 advanced economies over the period 2008-2023. The results provide important insights, indicating that inflation and institutional quality individually contribute to greater income inequality, whereas their combined effect helps alleviate inequality. Additionally, the study finds that trade openness and economic growth mitigate income inequality, whereas improved infrastructure has an intensifying effect.

The findings of this study highlight several crucial implications for advanced economies. Governments should adopt and consistently uphold a low inflation target to mitigate the widening of income inequality. In particular, strengthening institutional frameworks through targeted policies and regulations is essential - especially those aimed at supporting low-income earners. These initiatives should equip individuals with the education and skills necessary to access well-paying employment opportunities. Moreover, income redistribution policies should be redesigned and applied to promote greater economic inclusivity.

The increasing influence of digital technology and the rapid growth of financial markets facilitated by digital platforms necessitate a more thorough examination of their implications. In particular, future research should study the potential mediating role of these factors in shaping the relationship between inflation and income inequality. Given their robustness and ability to capture complex dynamics, advanced estimation techniques such as the dynamic CEE and CS-ARDL models or Method of Moments Quantile Regression present valuable tools for this inquiry. These models are particularly well-suited for addressing cross-sectional dependence and temporal lags. As such, their incorporation in future studies is strongly encouraged to ensure more precise and reliable insights into this intricate economic relationship. According to CEE and CS-ARDL models, the potential cross-sectional dependence and the stationarity (unit-root) properties of the variables need to be checked before applying.

The study period (2008-2023) includes several major economic shocks, most notably the Great Recession (late 2007 to mid-2009) and the COVID-19 pandemic. However, the impacts of these events are not explicitly examined in this study, which constitutes a limitation of the research. Future studies should investigate how these major shocks influence the relationships examined in this study and assess their potential effects on the findings.

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Conflict of interest

The author declares no conflicts of interest

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Appendix

Table A1- Data description

Variable	Definition	Type	Source
Income inequality (GIN)	"Estimate of Gini index of inequality in equivalized (square root scale) household (post-tax, post-transfer) income, using Luxembourg Income Study data as the standard."	level	Solt (2020)
Inflation (INF)	"Inflation, consumer prices (annual %)"	%	World Bank
Economic growth (GDP)	"GDP per capita (constant 2015 US$)"	log	World Bank
Trade openness (OPE)	"Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product."		
Infrastructure (TEL)	"Fixed telephone subscriptions (per 100 people)"	log	World Bank

Table A2 - Data description (six dimensions of governance)

Variable	Definition	Type	Source
Control of Corruption (GO1)	"Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."	value	World Bank
Government Effectiveness (GO2)	"Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."	value	World Bank
Political Stability (GO3)	"Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard	value	World Bank

	normal distribution, i.e. ranging from approximately -2.5 to 2.5."		
Regulatory Quality (GO4)	"Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."	value	World Bank
Rule of Law (GO5)	"Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."		
Voice and Accountability (GO6)	"Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5."	value	World Bank

Table A3 - Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GIN	544	30.554	4.138	22.1	40.4
INF	544	2.356	2.717	-4.478	19.705
GDP	544	40113.45	21464.1	10699.79	110425.9
OPE	544	129.401	90.675	23.392	442.62
TEL	544	37.546	14.384	2.456	66.350

Table A4 - Descriptive statistics - six dimensions of governance

Variable	Obs	Mean	Std. Dev.	Min	Max
GO1	544	1.284	0.725	-0.190	2.435
GO2	544	0.820	0.530	-1.625	2.317
GO3	544	1.275	0.507	-1.464	2.252
GO4	544	1.338	0.507	0.025	2.308
GO5	544	1.147	0.410	-0.334	1.967
GO6	544	1.327	0.485	-0.400	2.469

Table A5 - The matrix of correlation

	GIN	INF	GDP	OPE	TEL
GIN	1				
INF	0.012	1			
GDP	-0.010	-0.078*	1		
OPE	0.124***	0.072*	0.130***	1	
TEL	0.250***	-0.267***	0.116***	0.088**	1

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

Table A6 - The matrix of correlation - six dimensions of governance

	GO1	GO2	GO3	GO4	GO5	GO6
GO1	1					
GO2	0.517***	1				
GO3	0.738***	0.233***	1			
GO4	0.941***	0.523***	0.745***	1		
GO5	0.569***	0.453***	0.275***	0.590***	1	
GO6	0.863***	0.764***	0.764***	0.843***	0.343***	1

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