Fiscal Consolidation, Public Debt and Income Inequality: Emerging Evidence

This paper examines how public debt levels influence income inequality during periods of fiscal consolidation. Specifically, it assesses whether high public debt at the time of policy adjustments exacerbates inequality and explores the role of different adjustment strategies in shaping this relationship. To analyze these dynamics, a panel threshold methodology is applied across 16 OECD countries. The findings reveal that while public debt affects income inequality, its impact is more pronounced during fiscal adjustments, particularly within medium debt thresholds. Additionally, when comparing tax-based and spending-based adjustments, the results indicate that tax-based measures tend to have more persistent negative effects on income inequality.

Keywords: *Income inequality, Public debt, Austerity, Dynamic threshold model*

JEL classification: *E62; H2; H5; H6*

Introduction

During the 1930s and, more notably, following the global financial crisis, numerous governments adopted austerity measures in an effort to stimulate economic growth. However, de Carvalho (2018) contends that austerity should not be conflated with fiscal discipline. While austerity policies are designed to achieve budgetary balance and mitigate public debt in times of recession or economic downturn, empirical support for the notion that fiscal contractions can drive economic expansion remains weak. Some scholars argue that austerity may encourage private sector spending, yet historical evidence suggests that such policies tend to be largely ineffective during periods of recession (King et al. 2012).

Public debt plays a crucial role in economic development, contributing to both growth and social welfare. Over recent decades, public debt has been on an upward trajectory, with the global financial crisis and, more recently, the COVID-19 pandemic exacerbating this trend. The pandemic-induced economic downturn, coupled with the policy measures deployed to counteract it, led to an unprecedented surge in global debt levels. By 2020, global debt had risen by 29 percentage points to 262% of GDP, marking the most significant annual increase in half a century. In advanced economies, government debt soared to a record high of 120% of GDP (Kose et al. 2021).

Reducing debt ratios can be approached in multiple ways. One strategy involves fostering nominal GDP growth at a rate that outpaces interest rates. While this can lower debt ratios, it does not necessarily reduce the absolute debt stock. Alternatively, fiscal adjustment programs—commonly associated with austerity—target direct debt reduction. Although such programs may be contractionary in the short run, as suggested by extensive literature (e.g., Guajardo et al. 2011; Jorda and Taylor 2015; Alexiou and Nellis 2016; Alesina et al. 2019), proponents argue that

they offer a preferable solution to the risks posed by excessive debt burdens (Okeke et al. 2021).

The hypothesis of "expansionary austerity," which gained prominence in the aftermath of the 2007/08 financial crisis, has been largely refuted by empirical research (Alesina et al. 2019; Furceri et al. 2022). Nonetheless, maintaining lower public debt levels presents long-term economic benefits. In the wake of the pandemic, ensuring debt sustainability has become increasingly challenging, particularly due to the disproportionate impact on low-income groups (Furceri et al. 2022). The literature on inequality (e.g., Mulas-Granados 2005; Agnello and Sousa 2011, 2012; Ball et al. 2013; Heimberger 2020) suggests that fiscal consolidation efforts often exacerbate income disparities.

As governments deliberate over fiscal strategies, including the potential reimplementation of austerity policies, it is crucial to assess whether high public debt levels exacerbate inequality during fiscal adjustments. While extensive research has explored how the composition, scale, duration, and timing of adjustments influence distributional outcomes, the role of public indebtedness remains relatively underexamined. Notably, Klein and Winkler (2019) investigate the distributive effects of austerity in contexts of private debt overhang, finding that inequality intensifies when firms and households are highly leveraged. Moreover, their findings indicate that public debt levels influence these outcomes, with inequality being more pronounced during periods of low public debt compared to high public debt overhang.

Heterodox economist argue that austerity measures—such as cuts to government spending and tax hikes—are detrimental to economic stability, particularly during downturns, as they suppress aggregate demand and risk deepening recessions or depressions. Lavoie (2014) underscores the stabilizing function of government spending in times of economic distress, advocating for increased public expenditure during recessions to spur demand and generate employment.

Given the conflicting empirical findings regarding the relationship between public debt and income distribution, this study employs dynamic panel threshold models to analyze data from 16 OECD countries covering the period from 1980 to 2019. Specifically, we examine: the extent to which varying public debt thresholds influence income distribution during periods of fiscal consolidation and (b) the channels through which fiscal adjustments—whether tax-based or expenditure-based—affect distributional outcomes.

The remainder of this study is structured as follows: Section 2 provides a review of relevant literature, while Section 3 outlines the econometric methodology. Section 4 presents empirical findings in the context of existing research, and Section 5 offers concluding insights.

Brief Literature Review

Public debt as a share of GDP has steadily increased over the past four decades, with concerns about its sustainability intensifying post-global financial crisis. Cecchetti et al. (2011) highlight that debt has risen alongside economic growth, but

sustaining high debt levels depends on robust GDP growth to generate necessary revenues. While standard macroeconomic theories link government debt to tax smoothing, safe asset provision, and dynamic efficiency, political economy perspectives attribute rising debt to factors like an aging population, political polarization, and party turnover (Yared 2019).

Public debt can foster economic growth and welfare, but its effectiveness depends on its utilization, the business cycle, and financial market expansion. Kose et al. (2020) argue that the negative effects of rising debt, such as crowding out private and public investment, often outweigh the benefits. High interest rates may limit private investment and slow economic growth, while increased debt servicing costs could reduce essential public investment in education, healthcare, and infrastructure (Aiyagari and McGrattan 1998; Gasper et al. 2019). Additional risks include rising risk premia, constrained fiscal space, and heightened debt distress (Cecchetti et al. 2011; Yared 2019; Kose et al. 2020). Consequently, the debate on optimal debt levels remains central in economic literature.

Public Debt and Income Inequality Reinhart and Rogoff (2010) argue that when debt surpasses 90% of GDP, economic performance declines. They classify debt levels into four categories—low (0-30%), medium (30-60%), high (60-90%), and very high (>90%)—noting a weak link between debt and growth at lower levels but a significant negative impact beyond 90%. Their findings spurred extensive research on optimal debt levels and economic performance (Cecchetti et al. 2011; Taylor et al. 2012; Herndon et al. 2013).

Discussions on public debt and equity focus on how debt-financed expenditures impact welfare rather than direct causation. Bartak et al. (2022) find that rising public debt correlates with short-term income inequality increases, mainly due to fiscal adjustments affecting employment. Furceri et al. (2022) analyze pandemic-related debt sustainability, showing that GDP declines and inequality rises after pandemics, with fiscal balances deteriorating by 2.5 percentage points. They, along with Ghosh et al. (2013) and Ostry et al. (2015), emphasize that fiscal space, rather than absolute debt levels, determines a country's economic resilience.

Research suggests austerity exacerbates inequality via wage and employment channels (Agnello and Sousa 2011, 2012; Ball et al. 2013; Heimberger 2020). Revenue-based measures, like higher income taxes, may also worsen inequality by reducing net wages (Woo et al. 2013; Bova et al. 2018). Expenditure cuts in social benefits and public sector jobs further contribute to inequality, as lower-skilled workers face wage suppression and higher unemployment (IMF 2014). Ball et al. (2013) and Woo et al. (2013) estimate that unemployment accounts for 15-20% of increased income inequality.

Hypothesis development

From a Keynesian perspective, austerity policies have failed to drive economic recovery due to macroeconomic dynamics differing from micro-level behavior. While individuals accumulate assets by saving, at the macro level, increased savings reduce output by lowering aggregate expenditure (Steindl 1985). Keynes warned against equating household and government finances, a view often ignored by pre-Keynesian economists and austerity proponents. De Carvalho (2018) refutes this analogy, arguing that government spending raises aggregate income and tax revenues, unlike household spending.

Post-Keynesians view debt as both a driver of growth and a source of financial instability (Botta 2020). Unlike neoclassical economists who see debt as a future burden, they argue that debt is sustainable if productively used (Alexiou 2003, 2011). Economic activity influences debt levels: recessions reduce debt through lower activity, while growth increases it. Palley (2012) highlights the link between debt and inequality, emphasizing that inequality depresses aggregate demand, exacerbating unemployment and poverty.

High debt levels often lead to austerity, which can deepen inequality by cutting social programs, reducing access to essential services, and imposing tax increases that disproportionately impact lower-income groups. Additionally, austerity weakens economic growth by lowering demand, increasing unemployment, and worsening labor market conditions for disadvantaged groups.

While extensive research examines fiscal adjustments' effects on debt, growth, and inequality, the interaction between public debt and inequality through the fiscal channel remains underexplored. This leads to the hypothesis:

H1: Different public debt levels significantly impact income inequality during fiscal consolidation.

To test this, debt thresholds are analyzed alongside fiscal adjustment size and type (spending vs. taxation) to determine which adjustments drive inequality. Understanding these dynamics is crucial for policymakers, particularly in highly indebted and unequal economies, to anticipate austerity's potential consequences.

Empirical investigation

This study employs panel threshold and panel quantile methodologies (Seo & Shin 2016) to identify unknown threshold parameters and structural breaks in the relationship between variables (Wang 2015). The dataset spans 1980–2019 and includes 16 OECD countries, selected based on fiscal adjustment data availability. While inequality data captures trends up to 2019, post-pandemic indicators are excluded to avoid bias from COVID-19-related fiscal policies.

Income Inequality Data

The study uses multiple inequality proxies, including the Gini coefficient, top income shares, and labor income share, to provide a comprehensive view (Cobham & Sumner 2013; Kumhof & Ranciere 2010). These indicators ensure robustness by capturing shifts across the income distribution. Tables 1A and 2A in the appendix provide data sources and summary statistics.

Fiscal Adjustment Data

Narrative methodology, as used by Romer & Romer (2010), Devries et al. (2011), and Alesina et al. (2015), is preferred over CAPB-based approaches, which suffer from measurement errors and reverse causality (IMF 2010; Jorda & Taylor 2015). The dataset, extending Alesina et al. (2015) and Heimberger (2020), includes 227 fiscal adjustment episodes across the 16 OECD countries, with adjustment sizes ranging from -0.309% to 9.748% of GDP (Table 2B).

Public Debt Data

Debt-to-GDP ratios, sourced from the IMF's World Economic Outlook, reveal significant variation: Ireland, Italy, Portugal, Belgium, and Japan exceed 120%, while Australia records the lowest average (23.47%). Debt levels are categorized following Reinhart & Rogoff (2010) into "low" (<60% GDP) and "high" (>60% GDP) to align with existing literature (Herndon et al. 2013). Table 2C provides an overview of debt ratios and classifications.

Methodologies Considered

The baseline panel regression employs (i) a panel threshold model and (ii) a quantile panel regression model. Robustness checks include a fixed effects (FE) model with Driscoll-Kraay standard errors and an ordinary least squares (OLS) model with cross-section SUR.

Following Seo & Shin (2016), the panel threshold and quantile regression models use first-difference transformations. To address potential bias from correlation between transformed regressors and the error term, GMM estimation is applied with instrumental variables. Given the role of fiscal adjustment and debt in distributional impacts, an interaction term between these variables is included. Additionally, by explicitly modeling the interaction between debt levels and adjustment type (spending vs. taxation), the analysis assesses how different fiscal adjustment strategies affect inequality at various debt thresholds.

Results

Diagnostic Tests and Model Estimation

Before estimating the baseline panel regression, standard diagnostic tests—including stationarity, heteroskedasticity, correlation, and cross-sectional dependency—were conducted to assess variable fitness. Results indicated cross-sectional dependency among some panels. To correct for this in the pooled model, estimation was performed using generalized least squares (GLS) weights, along with cross-section seemingly unrelated regression (SUR). While full diagnostic test results are not presented for brevity, they are available upon request.

Classification of Fiscal Adjustments

Most fiscal adjustments in the dataset span multiple years and consist of a mix of tax hikes and spending cuts. To differentiate their distributional effects, adjustments are categorized based on the dominant instrument, following existing literature (e.g., Guajardo et al. 2011; Ball et al. 2013; Furceri et al. 2016). Spending-based adjustments occur when spending cuts exceed tax hikes, while tax-based adjustments are characterized by the opposite pattern.

Key Findings from the Panel Threshold Model

Gini Coefficient

The estimated debt threshold parameter is 60.73% of GDP (significant at the 1% level). Below this threshold, fiscal adjustments are associated with a 0.045 percentage point (ppt) decrease in inequality, while above the threshold, inequality increases by the same magnitude. Tax-based adjustments exhibit stronger inequality effects, with a slightly higher threshold of 64.47% of GDP and an inequality increase of 0.239 ppts. These findings align with Keynesian theory, austerity literature, and inequality research, which indicate that tax-based consolidations tend to have contractionary and regressive effects, particularly when reliant on indirect taxation (e.g., Bova et al. 2018; Ciminelli et al. 2019).

Labour Income Share

Both spending- and tax-based adjustments contribute to rising inequality. At lower debt thresholds (38.33% and 36.46% of GDP), spending cuts increase inequality by 0.225 ppts, while tax hikes have a much stronger effect, increasing inequality by 1.139 ppts. This supports findings by Alesina et al. (2019), which suggest that joint implementation of tax and spending adjustments accelerates debt reduction but may amplify inequality.

Income Share Ratios

- Top 1% (Top1): Below a debt threshold of 37.08% of GDP, inequality decreases by 1.404 ppts, while above this level, it increases by 1.402 ppts.

- Top 10% (Top10): Below a threshold of 37.70% of GDP, inequality decreases, but at higher debt levels, inequality rises by 3.914 ppts (1% significance).
- Bottom 40% (BOT40): Below a debt threshold of 66.34% of GDP, income share gains reduce inequality (0.042 ppt), but above this level, losses lead to increased inequality of the same magnitude.
- Bottom 50% (BOT50): Inequality increases at spending and tax thresholds of 38.33% and 66.96% of GDP, respectively, with spending adjustments contributing 0.664 ppts and tax-based adjustments 0.028 ppts.
- Palma Ratio: Spending-based adjustments primarily drive inequality increases at lower thresholds (38.11% of GDP), while tax-based adjustments exert similar effects at 51.11% of GDP.

Across different inequality measures, tax-based adjustments generally exhibit stronger adverse distributional effects than spending-based adjustments, particularly at medium and high debt levels. These findings highlight the significant role of debt levels in shaping the inequality consequences of fiscal consolidation. Full regression results are available upon request.

Robustness Assessment of Panel Threshold Regression Findings

To ensure the robustness of the Panel Threshold Regression results, the Driscoll-Kraay Fixed Effects (FE) model and the Pooled Ordinary Least Squares (OLS) model are employed. The analysis incorporates dummy variables interacted with fiscal adjustment size and adjustment type (spending vs. taxation) to assess their impact on inequality at different debt thresholds.
Results from the Driscoll-Kraay FE model closely align with those from the Pooled OLS model, with only slight variations in point estimates. For brevity, the results are not presented separately, except where significant differences exist. A summary of the key results for the Driscoll-Kraay model is provided in Table 2.

Table 1. *Model 1: Dynamic Threshold Panel Regression - Summary of Significant Results*

Gini						**Gini**					
Debt-Adj (Debt*Adjustment Size) Model						**Debt-Tax (Debt*Tax) Model**					
Regime 1: Debt ≤ 60.74%* **			**Regime 2: Debt ≥ 60.74%*** **			**Regime 1: Debt ≤ 64.47%*** **			**Regime 2: Debt ≥ '64.47%*** **		
Variable	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**
GiniLag(1)	-0.528	0.576	GiniLag(1)	0.131	0.441	GiniLag(1)	-1.221	2.575	GiniLag(1)	0.4528	1.955
Debt-Adj	-0.0005**	0.0002	Debt-Adj	0.0004**	0.0002	Debt-Tax	0.002**	0.001	Debt-Tax	-0.0023638*	0.001
Labour Income Share						**Labour Income Share**					
Debt-Spend (Debt*Spend) Model						**Debt-Tax (Debt*Tax) Model**					
Regime 1: Debt ≤ 38.33%* **			**Regime 2: Debt ≥ 38.33%%*** **			**Regime 1: Debt ≤ 36.46%*** **			**Regime 2: Debt ≥ 36.46%*** **		
Variable	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**
LabourShareLag(1)	1.520***	0.402	LabourShareLag(1)	-0.906***	0.272	LabourShareLag(1)	1.460	1.983	LabourShareLag(1)	-2.242	2.009
Debt-Spend	-0.2270**	0.110	Debt-Spend	0.225**	0.110	Debt-Tax	-1.138**	0.497	Debt-Tax	1.142**	0.499
TOP 1						**TOP 1**					
Debt-Spend(Debt*Spend) Model						**Debt-Tax (Debt*Tax) Model**					
Regime 1: Debt ≤ 53.27%* **			**Regime 2: Debt ≥ 53.27%****			**Regime 1: Debt ≤ 39.57%*** **			**Regime 2: Debt ≥ 39.57%*** **		
Variable	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**
TOP1Lag(1)	0.303	1.5736	TOP1Lag(1)	0.014	0.824	TOP1Lag(1)	0.514	2.045	TOP1Lag(1)	-0.800	1.707
Debt-Spend	-0.0026**	0.0012	Debt-Spend	0.002**	0.001	Debt-Tax	-0.014***	0.004	Debt-Tax	0.014***	0.004
TOP 10						**PALMA**					
Debt-Adj (Debt*Adjustment Size) Model						**Debt-Spend Model**					
Regime 1: Debt ≤ 37.70%* **			**Regime 2: Debt ≥ 37.70%****			**Regime 1: Debt ≤ '38.11%*** **			**Regime 2: Debt ≥ '38.11%*** **		
Variable	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**
TOP10Lag(1)	-0.607	10.681	TOP10Lag(1)	-0.052	10.562	PalmaLag(1)	-1.257	11.445	PalmaLag(1)	0.100	0.948
Debt-Adj	-0.039**	0.015	DebtAdj	0.039**	0.015	Debt-Spend	0.045**	0.021	Debt-Spend	-0.046**	0.020
PALMA											
Debt-Tax Model											
Regime 1: Debt ≤ '51.11%* **			**Regime 2: Debt ≥ '51.11%*** **								
Variable	**Coef.**	**Std. Err.**	**Variable**	**Coef.**	**Std. Err.**						
PalmaLag(1)	0.532	2.524	PalmaLag(1)	-0.546**	0.211						
Debt-Tax	-0.022**	0.010	Debt-Tax	0.022**	0.0106						

Notes: *** = significant at 1% level; ** = significant at 5% level; * = significant at 1% level; Debt-Adj = (Debt*Adjustment Size); Debt-Spend = (Debt*Spend; Debt-Tax = (Debt*Tax): interacts debt and; Debt-Adj = (Debt*Adjustment Size); Debt-Spend = (Debt*Spend); Debt-Tax = (Debt*Tax).

Table 2. *Driscoll Kraay Fixed Effects Summary of Estimated Result*

GINI			GINI			LABOUR INCOME SHARE			LABOUR INCOME SHARE		
DEBT-ADJ (DEBT*ADJUSTMENT SIZE)			DEBT-TAX (DEBT*TAX)			DEBT-SPEND (DEBT*SPEND)			DEBT-TAX (DEBT*TAX)		
Variable	**Coef.**	**Std. Error**	**Variable**	**Coef.**	**Std. Error**	**Variable**	**Coef.**	**Std. Error**	**Variable**	**Coef.**	**Std. Error**
GiniLag(1)	0.834***	0.0285	GiniLag(1)	0.834***	0.0285	LabourLag(1)	0.017	0.112	LabourLag(1)	0.034	0.112
Debt	-0.0002*	0.0001	Debt	-0.0002	0.0001	Debt	0.003	0.015	Debt	-0.010	0.015
SDDAD	-0.0004	0.0008	SDDTAX	-0.001	0.0024	SDDSPEND	0.378	0.238	SDDTAX	0.967***	0.253
MDDAD	-0.001	0.0014	MDDTAX	-0.001	0.0023	MDDSPEND	-0.754***	0.107	MDDTAX	-0.265	0.243
LDDAD	-0.001**	0.0006	LDDTAX	-0.004**	0.0014	LDDSPEND	-0.177	0.197	LDDTAX	-0.046	0.240
VLDDAD	-0.0004	0.0004	VLDDTAX	-0.001	0.0010	VLDDSPEND	-0.287***	0.040	VLDDTAX	-0.134	0.088
ELDDAD	0.001**	0.0006	ELDDTAX	0.003***	0.0009	ELDDSPEND	-0.221***	0.080	ELDDTAX	-0.226	0.135
Inflation	-0.001**	0.0002	Inflation	-0.001***	0.0002	Inflation	0.025	0.031	Inflation	0.035	0.030
Unemployment	0.0002	0.0001	Unemployment	0.0002	0.0001	Unemployment	-0.135***	0.029	Unemployment	-0.160***	0.033
GDPG	0.0001	0.0002	GDPG	0.0002	0.0002	GDPG	-0.225***	0.065	GDPG	-0.237***	0.071
Stock	0.0000	0.0000	Stock	0.00002	0.0000	Stock	0.002	0.003	Stock	0.002	0.002
C	0.066***	0.0115	C	0.066***	0.0116	C	1.577***	0.353	C	1.711***	0.387
TOP 1			**TOP 10**			**PALMA RATIO**			**PALMA RATIO**		
DEBT-SPEND (DEBT*SPEND)			**DEBT-SPEND (DEBT*SPEND)**			**DEBT-SPEND (DEBT*SPEND)**			**DEBT-TAX (DEBT*TAX)**		
Variable	**Coef.**	**Std. Error**	**Variable**	**Coef.**	**Std. Error**	**Variable**	**Coef.**	**Std. Error**	**Variable**	**Coef.**	**Std. Error**
TOP1Lag(1)	-0.205***	0.0455	TOP10Lag(1)	-0.205***	0.0499	Palma(Lag1)	0.971***	0.0080	PalmaLag(1)	0.970***	0.0077
Debt	-0.00001	0.0001	Debt	-0.0001	0.0001	Debt	-0.0005**	0.0002	Debt	-0.0003	0.0003
SDDSPEND	0.001	0.0011	SDDSPEND	0.001	0.0011	SDDSPEND	0.001	0.0016	SDDTAX	-0.002	0.0027
MDDSPEND	0.002**	0.0007	MDDSPEND	0.002*	0.0010	MDDSPEND	0.001	0.0015	MDDTAX	-0.009**	0.0045
LDDSPEND	0.0002	0.0006	LDDSPEND	-0.0003	0.0007	LDDSPEND	-0.005	0.0034	LDDTAX	-0.004	0.0057
VLDDSPEND	0.001	0.0005	VLDDSPEND	0.0001	0.0004	VLDDSPEND	0.005	0.0035	VLDDTAX	0.002	0.0064
ELDDSPEND	0.001	0.0005	ELDDSPEND	0.0005	0.0006	ELDDSPEND	0.006**	0.0024	ELDDTAX	0.007**	0.0034
Inflation	-0.00001	0.0001	Inflation	0.0002	0.0002	Inflation	0.0005*	0.0002	Inflation	0.0005**	0.0002
Unemployment	0.0004***	0.0001	Unemployment	0.001***	0.0002	Unemployment	-0.0002	0.0003	Unemployment	-0.0002	0.0004
GDPG	0.001***	0.0002	GDPG	0.001***	0.0002	GDPG	-0.001*	0.0003	GDPG	-0.0005	0.0004
Stock	0.00001	0.0000	Stock	0.00003	0.0000	Stock	0.0001	0.0001	Stock	0.0001	0.0001
C	-0.005***	0.0012	C	-0.005***	0.0013	C	0.035***	0.0101	C	0.035***	0.0100

Note: *** = significant at 1% level; ** = significant at 5% level; * = significant at 1% level*;* SDDAD = (SmallDebtDummy*Adjustment Size); MDDAD = (MediumDebtDummy*Adjustment Size); LDDAD = (LargeDebtDummy*Adjustment Size); VLDDAD = (VeryLargeDebtDummy*Adjustment Size); ELDDAD = (ExtremelyLargeDebtDummy*Adjustment Size); SDDSPEND = (SmallDebtDummy*Spend); MDDSPEND = (MediumDebtDummy*Spend); LDDSPEND = (LargeDebtDummy*Spend); VLDDSPEND = (VeryLargeDebtDummy*Spend); ELDDSPEND = (ExtremelyLargeDebtDummy*Spend); SDDTAX = (SmallDebtDummy*Tax); MDDTAX = (MediumDebtDummy*Tax); LDDTAX = (LargeDebtDummy*Tax); VLDDTAX = (VeryLargeDebtDummy*Tax); ELDDTAX = (ExtremelyLargeDebtDummy*Adjustment Size).

TOP10/BOTTOM50			TOP10/BOTTOM50		
DEBT-SPEND (DEBT*SPEND)			DEBT-TAX (DEBT*TAX)		
Variable	**Coef.**	**Std. Error**	**Variable**	**Coef.**	**Std. Error**
TOP10BOT50Lag(1)	0.851***	0.038	TOP10BOT50Lag(1)	0.846***	0.037
Debt	-0.002	0.004	Debt	-0.00020	0.004
SDDSPEND	-0.088	0.076	SDDTAX	-0.393***	0.114
MDDSPEND	-0.074	0.060	MDDTAX	-0.09300	0.069
LDDSPEND	-0.034	0.034	LDDTAX	-0.05800	0.042
VLDDSPEND	-0.010	0.028	VLDDTAX	-0.128**	0.051
ELDDSPEND	0.066**	0.027	ELDDTAX	0.081***	0.023
Inflation	-0.016**	0.006	Inflation	-0.012***	0.006
Unemployment	0.00700	0.004	Unemployment	0.00700	0.004
GDPG	0.021***	0.007	GDPG	0.021***	0.008
Stock	0.001*	0.001	Stock	0.001*	0.001
_cons	1.029***	0.277	_cons	1.075***	0.283

Note: *** = significant at 1% level; ** = significant at 5% level; * = significant at 1% level; SDDSPEND = (SmallDebtDummy*Spend); MDDSPEND = (MediumDebtDummy*Spend); LDDSPEND = (LargeDebtDummy*Spend); VLDDSPEND = (VeryLargeDebtDummy*Spend); ELDDSPEND = (ExtremelyLargeDebtDummy*Spend); SDDTAX = (SmallDebtDummy*Tax); MDDTAX = (MediumDebtDummy*Tax); LDDTAX = (LargeDebtDummy*Tax); VLDDTAX = (VeryLargeDebtDummy*Tax); ELDDTAX = (ExtremelyLargeDebtDummy*Adjustment Size).

Control Variables and Their Effects on Inequality

The control variables show consistent effects across different interaction models (debt-adjustment, debt-spending, and debt-tax). More specifically, inflation contributes to higher inequality, regardless of adjustment composition whilst unemployment has already been discussed as a transmission channel for inequality through labor share effects. GDP growth significantly increases inequality across most indicators, except for the Gini coefficient, Palma ratio, and Bottom 40% & 50% income shares.

Financialization and Inequality

Financialization, reflecting the growing role of financial markets and institutions in economic policy and outcomes, is measured using the stock-to-GDP ratio (Epstein 2001; Palley 2007; Huber et al. 2020; Kaldor 2021). The analysis explores its interaction with public debt levels and fiscal adjustments: The debt-stock interaction suggests that public debt does not amplify financialization's impact on inequality, as inequality effects are smaller when both factors are considered together. However, when the stock ratio is interacted with adjustment size, results indicate that tax-based adjustments reduce inequality. This implies that taxation may erode financialization-driven wealth gains, leading to a decline in inequality.

Private Debt and Inequality

To examine the influence of private debt on the public debt-adjustment-inequality relationship, private debt is introduced as a control variable. Literature suggests that private debt overhang during fiscal consolidations exacerbates inequality (Klein & Winkler, 2019). The private debt data, sourced from the Bank for International Settlements (BIS), is analyzed separately through:

1. Total Credit to the Non-Financial Sector (NFS)
2. Total Credit to Households (HHC)

To gauge the responsiveness of inequality to private debt, interaction terms with public debt and fiscal adjustment are introduced (debt-hhc-adj & debt-nfs-adj). The results reveal that a significant inequality increases for both private debt components, particularly through the Top 1% income share and Palma ratio indicators. Inequality rises at large debt thresholds (60-90%) for both household and non-financial sector credit under the Palma ratio, whereas for the Top 1%, increases occur at small (0-30%) and very high (90-120%) debt levels. Household debt appears to have a greater inequality effect than non-financial sector debt, supporting the view that high savings at the top and increased borrowing at lower income levels magnify inequality (Kumhof & Rancière, 2010). These findings align with Wood (2020), who shows that rising household debt contributes to greater income

concentration at the top (Top 10%) while reducing the income share of the Bottom 40%.

The robustness checks confirm the main findings from the Panel Threshold Regression. Private debt and financialization play crucial roles in shaping inequality effects, with tax-based adjustments mitigating financialization-driven inequality while household debt amplifies income concentration at the top. For conciseness, full results are not presented but are available upon request (see Table 2 for a summary of the Driscoll-Kraay Fixed Effects results).

Discussion

The analysis identifies several important threshold effects on inequality: Inequality effects are mostly significant at debt thresholds equal to or greater than medium levels. Inequality effects for the Top 10% and Top 1% income groups are significant at low to medium debt ratios, whereas those occurring through the Gini coefficient, Labour share, Palma ratio, and Bottom 40% & 50% income groups are significant at high to extremely high debt levels. While both spending and tax-based adjustments contribute to rising inequality, tax-based adjustments lead to larger increases. Inequality increases via the labour share channel are the largest among all indicators and are more prevalent across various debt thresholds. The interaction of public debt with fiscal adjustments exerts a stronger effect on inequality than public debt alone.

Public Debt and Inequality: The Role of the Top 1%

The distinct public debt variable is significant for both the Top 1% and Labour share in increasing inequality. The effect on the Top 1% is not surprising, given that government debt holders—primarily financial markets and high-income earners—receive interest payments that often exceed the taxes they pay (Anselmann & Kramer, 2016). This dynamic further widens income disparities.

However, the impact of public debt alone is smaller compared to when it is interacted with fiscal adjustments (spending or tax). This suggests that the debt-adjustment nexus cannot be ignored, as it amplifies distributional consequences. Mixed fiscal adjustments (spending & tax) contribute significantly to inequality increases, as reflected in the Labour share, Top 1%, Bottom 40% & 50%, and Palma ratio indicators. This aligns with findings by WIR (2022), which suggest that combining spending cuts and tax increases intensifies adverse distributional effects, disproportionately harming lower-income groups. These effects are particularly pronounced at very high debt levels, indicating that greater austerity measures are often required when debt is excessive.

However, some research argues against aggressive debt reduction. Ostry et al. (2015) maintain that if fiscal space is ample, deliberate debt reduction may be economically inefficient, as the costs of such policies often exceed their crisis-prevention benefits. Furceri et al. (2022) echo this perspective.

Labour share emerges as the strongest driver of inequality, with the largest increases observed at medium (30-60%) to extreme (≥120%) debt levels. A non-linear relationship is evident between low (0-30%) and medium (30-60%) debt thresholds: At low debt levels (0-30%), the labour share reduces inequality; At medium debt levels (30-60%), inequality rises through both spending and tax channels. This non-linearity aligns with findings from Herndon et al. (2013), which highlight a similar pattern between public debt and economic growth.

The findings emphasize that inequality effects depend on both debt levels and the type of fiscal adjustments. Tax-based adjustments and labour share reductions exacerbate inequality, particularly at medium to high debt thresholds. Moreover, mixed adjustment strategies amplify adverse distributional consequences, especially at high debt levels. The results also support the view that fiscal policy decisions should account for debt sustainability trade-offs, as aggressive debt reduction may come at significant social costs.

Concluding remarks

The existing literature acknowledges that business cycle conditions, economic context, adjustment size, duration, composition, and private debt dynamics influence distributional outcomes during fiscal adjustments. However, it is relatively silent on the role of public debt levels. This study fills this gap by examining how public debt dynamics affect income inequality during fiscal adjustment episodes.

Using a dynamic panel threshold methodology applied to 16 OECD countries over a 40-year period, the findings—robust across different model specifications—suggest the following:

1. Public debt levels impact income inequality, but the effects are more pronounced during fiscal adjustment (austerity) periods.
2. Different inequality indicators suggest varying threshold parameters, but adverse effects generally begin at medium and increase toward extreme debt levels.
3. Tax-based fiscal adjustments are more persistent in driving inequality increases compared to spending-based adjustments.

The findings suggest that a one-size-fits-all debt threshold for mitigating inequality is unrealistic, as the transmission channel determines the impact. While fiscal sustainability is important, lessons from post-2007/08 financial crisis consolidations highlight the risks of excessive austerity. In this regard, a short- to medium-term Keynesian approach—balancing spending increases and tax hikes—could be more prudent (Taylor et al., 2012). However, for spending to be effective, it should be directed toward productive investments (e.g., employment creation) rather than consumption-based transfers. This approach would stimulate aggregate demand and foster economic growth.

Since tax-based fiscal adjustments contribute more significantly to inequality, policymakers should design tax policies that emphasize progressive taxation, ensuring higher-income groups and corporations contribute a fair share; expand the tax base, incorporating short-term measures such as one-off windfall taxes to mitigate inequality without dampening economic activity; Utilize tax revenues to fund productive spending, reinforcing economic stability and growth.

Structural Nature of Inequality and Long-Term Solutions

Inequality is a structural issue rooted in capitalist power dynamics, where income and wealth distribution favor those with greater economic influence. Addressing this requires policy interventions that reshape power relations in economic structures. Potential solutions include progressive taxation policies to reduce income disparities, minimum wage laws to enhance labor market equity, robust social welfare programs to redistribute wealth, enhance aggregate demand, and support economic growth.

The study underscores that public debt matters for inequality, particularly during fiscal adjustment periods. The policy response should be tailored—a balanced approach of strategic spending and progressive taxation could mitigate inequality while supporting sustainable growth. Recognizing inequality as a systemic issue reinforces the need for structural policies that ensure fairer wealth distribution and long-term economic stability.

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Appendix

Table 1A. *Definition of variables*

Variables	Definition	Source
GINI	The Gini coefficient measures the distribution of income in a population. It ranges between 0 and 1; where 0 denotes perfect equality and 1 perfect inequality	OECD
LABOUR SHARE	It is that part of national income which is allocated for labour compensation.	OECD
TOP1	This refers to the share of all income received by the 1% with the highest income in the population.	https://wid.world
TOP10	This refers to the share of all income received by the 10% with the highest income in the population.	https://wid.world
BOTTOM40	This is the share of all income received by the bottom 40% in the income distribution ladder i.e. the 40% with the lowest income in the population (wid.world). It is measured in percentages.	https://wid.world
BOTTOM50	This is the share of all income received by the bottom 50% in the income distribution ladder i.e. the 50% with the lowest income in the population (wid.world). It is measured in percentages.	https://wid.world
PALMA RATIO	The Palma ratio is the share of all income received by the 10% people with highest disposable income divided by the share of all income received by the 40% people with the lowest disposable income. In other words, the Palma ratio indicator measures the income share of the top decile relative to the bottom 40.	OECD
TOP10BOT50	This is the ratio of the top decile to the bottom 50 in the income distribution i.e. the income share of the richest 10% in the population divided by the income share of the poorest 50%.	https://wid.world
INFLATION	This refers to the inflation rate and is the annual percentage change in the cost of living and is measured by the consumer price index.	oecd.org; un.org; imf.org
UNEMPLOYMENT	The annual unemployment rate measures the numbers of unemployed people as a percentage of the labour force.	OECD
TRADE	Trade refers to trade openness and captures the sum of total exports and imports as a percentage of GDP.	oecd.org; worldbank.org; imf.org
GDPG	This refers to the gross domestic product growth rate and it measures the total annual income earned from productive capacities (i.e. economic activities) less imports.	OECD
EPISODE DUMMY	This is a dummy variable which represents the fiscal adjustment episodes - with 1 corresponding to the start of an episode and 0 otherwise.	Agnello et al. (2013); Ball et al. (2013); Furceri et al. (2013); Heimberger (2020)

ADJUSTMENT SIZE	This is the budgetary impact of the fiscal adjustments scaled relative to GDP i.e. the fiscal adjustment size measured as a percentage of GDP.	Devries et al. (2011); Alesina et al. (2015)
PUBLIC DEBT	Public Debt to GDP ratio is also referred to as the general government debt-to-GDP ratio. It measures the gross debt of the general government as a percentage of GDP. It is a key indicator for the sustainability of government finance	OECD

Table 2A. *Descriptive Statistics*

	Mean	**Maximum**	**Minimum**	**Std. Dev.**
ADJUSTMENT SIZE	0.56811	9.74799	-0.30894	1.183494
DEBT	67.90231	236.139	-75.514	42.35493
INFLATION	3.449047	28.38	-4.48	3.77455
UNEMPLOYMENT	8.042225	26.09	1.46	3.999918
GDPG	2.284429	25.17625	-8.074447	2.414256
STOCK	53.95619	396.8041	-29.60648	67.7945
LONG-TERM INTEREST RATE	6.255156	38.5	-12	5.244525
PRIVATE DEBT - HOUSEHOLD	53.79313	137.9	-100.4	30.38745
PRIVATE DEBT - NON FIN SECTOR	142.3692	323	53.9	48.4377
GINI	0.390219	0.56	0.26	0.069098
LABOUR SHARE	75.35078	97.65	50.83	6.022229
TOP1	0.090494	0.1933	0.0324	0.029767
TOP10	0.303382	0.4602	0.2076	0.05696
BOT40	0.169187	0.2565	0.0942	0.038272
BOT50	0.240187	0.3355	0.1282	0.049734
PALMA	1.289247	4.04	-1.56	0.753712
TOP10BOT50	6.901562	18	3	3.121634
TOTAL INCOME SHARE (log)	25.03614	28.71069	21.31436	1.413233
LARGE-VLGE-EXT LGE COUNTRIES	95.70406	236.139	23.193	42.88008
SMALL MED DEBT COUNTRIES	46.27872	108.8	-75.514	26.31389

Table 2B. *Fiscal Adjustment Episodes*

16 OECD COUNTRIES	**1980 – 2014**
Countries	**Fiscal Adjustment Episodes**
Australia	1985-88; 1994-99
Austria	1980-81; 84; 1996-97; 2001-02;2011-14
Belgium	1982-87;1990; 1992-94;1996-97;2010-14
Canada	1983-97;2010-14
Denmark	1982-85;1994-95;2009-13
Finland	1992-97;2010-14
France	1987-89;1991-92;1995-00;2010-14
Germany	1982-84;1991-95;1997-00;2003-07;2011-13
Ireland	1982-88;2008-14
Italy	1991-98;2004-07;2010-14

Japan	1980-83;1997-98;2003-07
Portugal	1983;2000;2002;2005-07;2010-14
Spain	1983-84;1989-90;1992-97;2009-14
Sweden	1984;1993-98
United Kingdom	1980-82;1993-99;2010-14
United States	1980-81;1985-88;1990-98;2011-13

Source: Alesina et al. (2015) dataset available at www.igier.unibocconi.it/fiscalplans

Table 2C. *Public Debt to GDP Ratio Categories*

DEBT CATEGORY					
Debt Size	**0-30%**	**30-60%**	**60-90%**	**90-120%**	**≥ 120%**
Category	Small	Medium	Large	Very Large	Extremely Large

	Debt Range, Frequency & Category (1980 -2019)											
	0-30% (Small)		30-60% (Medium)		60-90% (Large)		90-120% (Very Large)		120% & Above (Extremely Large)			
Country	**Year Range**	**Debt Ratio Range % & Frequency**	**Year Range**	**Debt Ratio Range % & Frequency**	**Year Range**	**Debt Ratio Range % & Frequency**	**Year Range**	**Debt Ratio Range % & Frequency**	**Year Range**	**Debt Ratio Range % & Frequency**	**DebtCategory**	**Ave Debt Ratio % GDP**
Australia	80-92; 96-12	9.68 - 29.36; 30x	93-95; 13-19	30.49 - 46.80; 10x	-	-	-	-	-	-	SmallDebtRatio	23.47
Austria	-	-	86-92	55.93 - 59.43; 7x	80-85; 93-19	60.46 - 84.40; 33x	-	-	-	-	LargeDebtRatio	67.72
Belgium	-	-	-	-	80-81; 07	76.80 - 89.69; 3x	82-85; 98-06; 08-19	91.49 - 119.388; 25x	86-97	124.271 - 138.926; 12x	VLargeDebtRatio	110.82
Canada	-	-	80-83	44.59 - 57.21; 4x	84-92; 99-14; 17-19	60.21 - 88.97; 28x	93-98; 15-16	91.22 - 100.24; 8x	-	-	LargeDebtRatio	78.26
Denmark	80-88; 07	-75.51 - 27.35; 10x	89-91; 99-06; 08-19	31.20 - 56.76; 23x	92-98	60.28 - 78.63; 7x	-	-	-	-	MediumDebtRatio	30.76
Finland	80-91	10.89 - 21.89; 12x	92-14; 18-19	32.56 - 59.83; 25x	15-17	61.17 - 63.64; 3x	-	-	-	-	MediumDebtRatio	38.83
France	80-84	20.83 - 29.09; 5x	85-96; 00-01	30.70 - 59.99; 14x	97-99; 02-11	60.26 - 87.84; 13x	44914.00	90.60 - 98.13; 8x	-	-	MediumDebtRatio	59.77
Germany	80-87	11.83 - 29.11; 8x	85-98; 00-02; 19	31.58 - 59.95; 15x	99; 03-18	60.39 - 82.00; 17x	-	-	-	-	MediumDebtRatio	52.39
Ireland	44627.00	27.65 - 29.82; 5x	98-02; 08; 19	30.87 - 57.22; 7x	94-97; 09-10; 15-18	61.58 - 87.21; 10x	91-93; 11-12; 14	95.90 - 119.67; 6x	80-90; 13	120.04 - 208.86; 12x	VLargeDebtRatio	93.62
Italy	-	-	-	-	80-86	73.89 89.86; 7x	87-92; 95-11	92.53 - 119.69; 23x	93-94; 12-19	123.417 - 135.37; 10x	VLargeDebtRatio	109.85
Japan	-	-	80-82	47.84 - 57.78; 3x	83-94	63.62 - 84.36; 12x	95-98	92.53 - 116.02; 4x	99-19	129.50 - 236.14; 21x	ELargeDebtRatio	136.82
Portugal	80-81	23.19 - 26.90; 2x	82-89; 92-93; 97-01	30.60 - 58.72; 15x	90-91; 94-96; 02-09	60.04 - 87.80; 13x	10-11; 19	100.21 - 116.61; 3x	44913.00	121.48 - 132.94; 7x	LargeDebtRatio	72.83
Spain	80-82	16.58 - 25.14; 3x	83-94; 00-09	30.38 - 58.68; 22x	95-99; 10-12	63.38 - 86.31; 8x	13-19	95.54 - 100.70; 7x	-	-	MediumDebtRatio	56.94
Sweden	-	-	80-90; 00-19	34.00 - 58.39; 31x	91-99	60.07 - 68.68; 9x	-	-	-	-	MediumDebtRatio	48.83
United Kingdom	90-91	28.44 - 28.52; 2x	80-89; 92-08	42.59 - 49.03; 27x	44823.00	62.84 - 86.02; 11x	-	-	-	-	MediumDebtRatio	50.68
United States	80-91	2.91 - 29.23; 12x	92-03	31.62 - 58.63; 12x	44660.00	64.22 - 84.64; 6x	44853.00	95.20 - 108.80; 10x	-	-	MediumDebtRatio	54.83

Notes: Year Range: for e.g. 80-92 = 1980 to 1992; Debt Ratio Range: for e.g. 9.68 - 29.36 = debt ratio range for 1980 to 1992 and 1996 to 2012. Debt for the period ranged between 9.68% and 29.36%; Frequency: for e.g. 30x = the number of years debt ratio fell within the identified range. In other words, out of 40 years, Australia had low debt ratios for a total of 30 years.