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Fiscal redistribution, household debt, and
consumption: Evidence of a non-linear moderating
effect

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Abstract

Michal Škára and Ladislava Issever Grochová: **Fiscal redistribution, household debt, and consumption: Evidence of a non-linear moderating effect**

This paper examines whether fiscal redistribution moderates the consumption effects of household debt shocks and whether this moderating role is non-linear. Using panel local projection methods for 31 countries over the period 1980–2023, the analysis focuses on the household consumption channel and distinguishes between the debt-service peak phase and the subsequent labor market stress phase following a credit expansion. The results reveal a hump-shaped non-linearity in the moderating effect of overall redistribution: the stabilizing impact strengthens with redistribution intensity up to an intermediate level and weakens thereafter. While the effect is economically meaningful during the debt-service peak, it becomes statistically significant and quantitatively stronger when unemployment rises and wage growth declines, suggesting that redistribution operates primarily through income-support mechanisms. In contrast, redistribution targeted solely at the tails of the income distribution does not provide measurable stabilization of consumption. The findings highlight that the macroeconomic effectiveness of fiscal redistribution depends on both its intensity and its design, and that broad-based redistribution plays a more robust stabilizing role in the aftermath of household debt shocks.

Key words

Fiscal redistribution, non-linearity, consumption growth, household debt

JEL: D14, D31, E21, E62, H24

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Introduction

The accumulation of private debt has been recognized as a key source of macroeconomic fragility. While the Global Financial Crisis of 2008 provided a clear illustration of the risks associated with excessive leverage and housing market imbalances (Boone et al., 2022), the current rise in indebtedness reflects a much deeper structural trend unfolding since the post-war period (Jordà, Schularick and Taylor, 2017). This persistent build-up of household debt liabilities has not only reshaped monetary policy frameworks (Friedman and Kuttner, 1992; Schularick and Taylor, 2012), but has also fundamentally altered the transmission of macroeconomic shocks by placing household balance sheets at the center of aggregate demand dynamics.

The existing literature shows that expansions in household credit can temporarily stimulate private consumption and economic activity (Mian, Sufi and Verner, 2017; Müller and Verner, 2024). This expansionary phase is, however, systematically followed by a contraction in spending once households enter the repayment period (Mian, Sufi and Verner, 2017). Rising debt-service obligations gradually become a binding constraint on household budgets, forcing indebted households to reduce consumption in order to meet repayment commitments (Drehmann, Juselius and Korinek and Simsek, 2017; Tunc and Kilinc, 2023). As a result, household consumption emerges as the primary channel through which debt shocks propagate to the broader economy (Mian and Sufi, 2018). For this reason, the present analysis focuses exclusively on the household sector and on final consumption as the key margin of adjustment.

Beyond documenting the dynamic relationship between household indebtedness and economic activity across different horizons, prior research has increasingly emphasized the role of institutional and policy-related factors that condition the macroeconomic consequences of household debt. These include monetary policy regimes (Mian, Sufi and Verner, 2017; Alter, Feng and Valckx, 2018; Kim and Zhang, 2021), financial market development (Alter, Feng and Valckx, 2018; Bahadir, De and Lastrapes, 2020), regulatory frameworks (Mian, Sufi and Verner, 2020), trade openness (Kim and Zhang, 2021), stages of economic development (Mian, Sufi and Verner, 2017; Alter, Feng and Valckx, 2020), income inequality (Bahadir, De and Lastrapes, 2020; Škára and Grochová, 2025), and fiscal redistribution implemented through personal taxes and transfers (Škára and Grochová, 2025). However, the extent to which the level and composition of fiscal redistribution shape the macroeconomic impact of household debt remains largely unexplored.

Fiscal redistribution is intrinsically linked to household consumption, which constitutes the largest and most volatile component of aggregate demand after positive household debt shock (Mian, Sufi and

Verner, 2017). By reallocating resources toward budget-constrained households, redistribution can relax binding liquidity constraints and support private consumption (Duncan and Peter, 2016; Carbonell-Nicolau and Llavador, 2021), particularly during periods of rising debt-service burdens when household budgets are under pressure (Škára and Grochová, 2025). Given that the primary transmission mechanism of household debt to the real economy operates through fluctuations in household demand (Mian and Sufi, 2018), focusing on consumption allows for a more direct identification of the moderating role of fiscal redistribution.

However, the capacity of fiscal redistribution to stabilize consumption is unlikely to be uniform across different levels and forms of redistribution. When redistribution is limited, it may be insufficient to meaningfully ease household budget constraints. Conversely, at higher levels its additional stabilizing effect may diminish, suggesting a potentially non-linear relationship between redistribution and economic performance (Berg et al., 2018). Moreover, the effectiveness of redistribution depends on its targeting, as policies directed toward low-income households appear to be more growth-supportive than untargeted transfers (Christl, De Poli and Köppl-Turyna, 2025). Although Škára and Grochová (2025) show that redistribution alleviates the adverse effects of household debt across different income-inequality environments, they do not explicitly examine whether the moderating effect varies with the intensity of redistribution itself. Building on this gap, the present article investigates whether the moderating role of fiscal redistribution in the transmission of household debt shocks to consumption differs across varying degrees of redistribution and according to the groups toward which redistribution is directed.

The rest of this paper is organized as follows. Section 2 presents the theoretical background on the effect of household debt on consumption and the role of fiscal redistribution in easing household budget constraints, including its potential non-linear effects. Section 3 describes the data and methodology. Section 4 presents the empirical results. Section 5 discusses the main findings and Section 6 offers policy conclusions.

1 Theoretical background

An increase in household indebtedness tends to support economic activity in the short run, but constrains it over the medium and longer horizons (Mian, Sufi and Verner, 2017). As emphasized by Mian and Sufi (2018), household demand represents the central transmission channel through which debt affects the final output. In the initial phase, a positive credit shock leads to higher household consumption of goods and services (Mian, Sufi and Verner, 2020). This expansionary effect, however, is temporary. Once the borrowing phase ends, typically within three years (Mian, Sufi and Verner,

2017), households enter the repayment period. During this phase, highly leveraged households are forced to allocate a growing share of their income to debt servicing, resulting in a sharper contraction of consumption relative to less indebted households, which occur from three to four years after the peak in borrowing phase (Drehmann, Juselius and Korinek and Simsek, 2017). Since debt-service ratios tend to reach their maximum several years after the initial credit expansion, the most pronounced decline in consumption materializes between the fourth and seventh year following the household credit shock (Škára and Grochová, 2025).

In addition to its effects on demand, credit expansion induces structural adjustments that weigh on long-term GDP performance. Periods of rapid household credit growth tend to stimulate consumption primarily in the non-tradable sector, accelerating growth in employment, wages, and prices in this segment relative to the tradable sector. Such sectoral imbalances contribute to mounting inflationary pressures (Mian, Sufi and Verner, 2020). At the same time, the non-tradable sector typically exhibits lower productivity in comparison to tradable sector (Müller and Verner, 2024). As labor shifts toward this sector, the reallocation of human capital leads to a decline in aggregate productivity. When combined with nominal rigidities, these cost pressures ultimately result in job losses and higher unemployment (Schmitt-Grohé and Uribe, 2016). This structural adjustment further suppresses household demand and reinforces the long-run contraction in GDP.

The literature on redistribution and growth highlights that the effects of fiscal redistribution on economic activity depend on both its scale and its design. Classical efficiency-based arguments emphasize that redistribution financed through distortionary taxation may weaken incentives to work, save, and invest, implying rising marginal efficiency costs as redistribution intensifies (Okun, 2015; Barro, 2000). In contrast, more recent cross-country evidence suggests that redistribution is generally benign for growth and may even enhance growth durability by reducing inequality, with negative growth effects emerging only at very high levels of redistribution (Ostry, Berg and Tsangarides, 2014; Berg et al., 2018). These findings point to a non-linear relationship between redistribution and economic performance, where the marginal growth impact of redistribution varies with its intensity.

A key mechanism behind this non-linearity operates through consumption smoothing and household balance sheets. Redistribution provides disproportionately strong consumption-smoothing benefits to borrowing-constrained households, particularly when access to credit is limited and households rely on future income to finance current consumption (Bertola and Koeniger, 2007). By raising current disposable income, redistribution can relax effective borrowing constraints, reduce reliance on debt, and stabilize consumption, especially for low-income households with high marginal propensities to consume (Jappelli and Pistaferri, 2014). Recent evidence confirms that redistribution targeted to low-

income households supports growth primarily through the consumption and private-investment channels, while redistribution directed toward high-income households or pensioners has weaker or negative growth effects (O'Reilly, 2018; Hammer, Christl and De Poli, 2023; Christl, De Poli and Köppl-Turyňa, 2025). Taken together, these insights suggest that the moderating effect of fiscal redistribution is inherently conditional on its targeting: the macroeconomic impact of redistribution depends critically on who benefits from it, as the stabilizing capacity of fiscal policy may differ substantially across income groups.

Although these relationships are well established, the capacity of fiscal redistribution, particularly in terms of its intensity and design, to moderate the macroeconomic consequences of household debt remains underexplored. Policy instruments such as personal taxes, social security contributions, and transfers can, in principle, weaken the connection between rising household indebtedness and subdued economic performance (Škára and Grochová, 2025). This paper contributes to the literature by examining whether fiscal redistribution can moderate the adverse effects of household debt on consumption and by assessing how this moderating role varies across different levels and designs of redistribution. Particular attention is devoted to the medium-term adjustment phase following a household debt shock, when debt-service burdens intensify and household liquidity constraints become increasingly binding. During this period, fiscal redistribution may play an important role in mitigating balance sheet pressures. The analysis further extends beyond the debt-service peak to the subsequent labor market stress phase, characterized by rising unemployment and declining wage growth. In this later stage, redistribution can contribute to stabilizing consumption through income-support mechanisms. While household debt may also affect long-run outcomes through structural labor market adjustments and human capital reallocation, such mechanisms unfold gradually and lie beyond the primary focus of this study. Accordingly, the analysis centers on the consumption channel, allowing for a clearer identification of how fiscal redistribution interacts with household balance sheet constraints and labor income shocks in the aftermath of household debt expansions.

2 Data and methods

This section describes the dataset used to analyze the interaction between household debt shocks, fiscal redistribution, and private consumption, with particular attention to the potential non-linear moderating role of redistribution. It then presents the local projection framework employed to estimate the dynamic consumption responses.

2.1 Data

In this paper, an unbalanced panel dataset was constructed including information on household consumption at constant prices obtained from the World Development Indicators (World Bank, 2025) database. Household debt data are drawn from the BIS's Credit to the non-financial sector data set. Debt takes the form of loans, debt securities, and currency and deposits, provided by domestic banks, foreign banks, and other financial institutions. The dataset also contains control variables, including long-run interest rates, reflecting financing conditions and investor expectations, defined as yields on government bonds with a ten-year maturity. Short-run interest rates, capturing the cost of short-term financing and the monetary policy stance, defined as money market rates, typically three-month interbank rates or Treasury bill rates. Both long-run and short-run interest rates are obtained from IMF International Financial Statistics (IFS) and OECD Economic Outlook. The consumer price index (CPI), measuring price stability, the investment-to-GDP ratio, distinguishing whether credit booms are driven by consumption or capital formation and the current-account-to-GDP ratio, capturing the role of international capital flows, are obtained from World Development Indicators database (World Bank, 2025) and IMF World Economic Outlook (WEO). Share of individuals employed in tradable sector to the overall employed people controls for the shift of the labor force caused by household debt shock obtained from OECD Structural Analysis Database. Additionally, to help explain the effect of household debt, data on the credit-market participation of households in the bottom 40 percent of the income distribution are used. These data are sourced from the World Bank's Global Findex survey and are available only for a limited set of years. Their limited coverage implies that these variables are used for descriptive purposes rather than as controls in the regression models. Finally, Income inequality is measured using the Gini coefficient and the Palma ratio.

Both income inequality measures, from which the redistribution indicators are derived, are available in pre-tax and post-tax national income versions as defined by the World Inequality Database (WID). The pre-tax measures capture income inequality prior to the operation of the fiscal system, that is, before the payment of personal taxes and the receipt of government transfers, while still including replacement income such as pensions and unemployment benefits. In contrast, the post-tax measures reflect inequality after the fiscal system has operated, netting out personal taxes and social security contributions and allocating to households both cash transfers and the imputed value of in-kind transfers.

In the empirical analysis, inequality measures labeled as “pre-tax” and “post-tax” refer to income inequality before and after fiscal redistribution, respectively, in line with WID terminology. The final sample consists of 31 countries observed annually over the period 1980–2023.

Table I Descriptive statistics

Variables	(1) N	(2) Mean	(3) St. Dev.	(4) Min	(5) Q1	(6) Med	(7) Q3	(8) Max
d^{HH}	1,089	55.55	28.04	5.00	34.80	52.60	70.20	132.40
$Palma_1$	1,089	3.89	3.84	1.17	2.09	2.56	3.41	23.46
$Palma_2$	1,089	2.19	2.12	0.57	1.06	1.47	2.18	14.10
$Gini_1$	1,089	48.22	9.50	31.88	42.09	45.65	50.30	76.42
$Gini_2$	1,089	36.05	12.45	14.70	27.39	34.07	39.79	72.60
<i>overall</i>	1,089	12.17	5.17	-1.35	8.99	12.04	15.75	27.56
<i>top-to-bottom</i>	1,089	1.71	1.98	0.10	0.92	1.16	1.51	16.88
$\Delta_1 d^{hh}$	1,089	0.88	3.09	-22.60	-0.60	0.80	2.40	12.30
$\Delta_1 cons$	1,087	2.45	3.02	-14.20	1.05	2.43	3.98	18.93
<i>cons_share</i>	1,087	0.52	0.09	0.28	0.47	0.52	0.58	0.76
$\Delta_1 overall$	1,079	0.07	0.77	-4.43	-0.27	0.05	0.40	6.49
$\Delta_1 top-to-bottom$	1,079	0.02	0.50	-5.27	-0.03	0.01	0.06	8.97

Note: Variables *cons*, d^{HH} , $Gini_1$, $Gini_2$, $Palma_1$, $Palma_2$, *overall*, *top-to-bottom* and *cons_share* represent, the logarithm of GDP at constant local currency prices, household debt to GDP ratio in percent, the Gini coefficient pre-tax and post-tax, the Palma ratio pre-tax and post-tax and the level of redistribution defined by Berg et al. (2018) as the difference between $Gini_1$ and $Gini_2$ and difference between $Palma_1$ and $Palma_2$ and household consumption as a share of GDP, respectively.

Table 1 presents descriptive statistics for the key variables employed in the analysis. The data reveal a sustained increase in household debt alongside continued growth in household consumption over the period under study. An additional notable pattern concerns redistribution dynamics. Overall redistribution expanded at a substantially faster pace than redistribution measured at the tails of the income distribution. The divergence between these two measures reflects their different underlying scaling properties, as the Gini coefficient captures broad distributional changes across the entire income spectrum, whereas the Palma ratio concentrates specifically on disparities between the top and bottom segments of the distribution.

2.2 Methods

In the empirical analysis, the selected variables are expressed in first differences. To capture the cumulative effect of shocks, the dependent variable household consumption is transformed into the h-step-ahead long difference, defined as:

$$\Delta_h cons_{it+h} = cons_{it+h} - cons_{it}$$

where $cons_{it}$ denotes the logarithm of household consumption of country i in period t.

To examine the effect of fiscal redistribution on subsequent economic activity in the presence of household debt shocks, local projection models following Jordà (2005) are estimated based on Equation (1) using panel data. This approach allows for tracing how fiscal redistribution modifies the dynamic impact of household debt across different time horizons. The analysis focuses on selected horizons corresponding to the period during which household budget constraints become most binding:

$$\begin{aligned}
\Delta_h cons_{it+h} = & \alpha_i^h + \sum_{j=0}^p \beta_{HH,j}^h * \Delta_1 d_{it-j}^{HH} + \sum_{j=0}^p \beta_{redist\ k,j}^h * d_{it-j}^{redist\ k} + \sum_{j=0}^p \beta_{redist^2\ k,j}^h * d_{it-j}^{redist\ k^2} \\
& + \sum_{j=0}^p \beta_{int,j}^h * (\Delta_1 d_{it-j}^{HH} * d_{it-j}^{redist\ k}) + \sum_{j=0}^p \beta_{int^2,j}^h * (\Delta_1 d_{it-j}^{HH} * d_{it-j}^{redist\ k^2}) \\
& \sum_{j=0}^p \delta_j^h * \Delta_1 cons_{it-j} + \sum_{j=0}^1 \Gamma_j^h * X_{it-j} + \sum_{j=0}^2 \theta_j^h * Z_{it-j} + \epsilon_{it+h}^h
\end{aligned} \tag{1}$$

where α_i^h is a country fixed effect, $cons_{it}$ denotes the logarithm of real household consumption. Household consumption is used instead of aggregate (total) consumption because the objective of the paper is to examine the transmission of household debt shocks through the household demand channel. Since household debt directly affects the balance sheets and intertemporal budget constraints of households, household consumption provides the most appropriate outcome variable for identifying this mechanism. Moreover, household consumption accounts for approximately 52 percent of GDP (see Table 1), implying that the results remain economically meaningful in terms of aggregate activity despite the narrower focus. d_{it}^{HH} represents household debt and $d_{it}^{ineq\ k}$ denotes redistribution. The index $k \in \{1,2\}$ distinguishes between overall redistribution ($k=1$) and top-to-bottom redistribution ($k=2$). The interaction term $\Delta_1 d_{it}^{HH} * d_{it}^{ineq\ k}$ captures the linear moderating effect of redistribution on the impact of household debt shocks, while the quadratic interaction term $\Delta_1 d_{it}^{HH} * d_{it}^{ineq\ k^2}$ allows for a potential non-linear moderating effect. The model includes two sets of control variables that differ in its lag structure. First, Z_{it} captures the monetary policy controls, namely the long-term and short-term interest rates. Given that the transmission of monetary policy typically unfolds over a horizon of twelve to twenty-four months (Havránek and Rusnák, 2012), the specification includes contemporaneous values, one-year lags, and two-year lags of the interest rate variables. Second, X_{it} includes additional macroeconomic controls, largely following Jordà, Schularick and Taylor (2013). These comprise the consumer price index (CPI), the investment-to-GDP ratio, the current account balance as a share of GDP, and the share of employment in the tradable sector. These variables

enter the model in contemporaneous form and with one-year lags. All control variables are included in levels rather than first differences, with the exception of the investment-to-GDP ratio and the CPI. Finally, ϵ_{it} denotes the error term. To account for potential correlation of shocks both within countries over time and across countries in a given year, standard errors are clustered by country and time. The lag length is set to $p = 4$ based on the Akaike Information Criterion (AIC).

A central aspect of the empirical strategy concerns the measurement of fiscal redistribution. Christl, De Poli and Köppl-Turyna (2025) argue that the standard measure of overall redistribution, defined by Berg et al. (2018) as the difference between the Gini coefficient of market and disposable income, may conflate redistribution across income groups with life-cycle redistribution, particularly through pension systems. Since pension schemes primarily smooth income over the life cycle rather than redistribute across income groups, aggregate redistributive measures may obscure heterogeneity in macroeconomic effects.

Despite these considerations, the present analysis relies primarily on the conventional Gini-based redistributive measure. Alternative microdata-based indicators, such as Net Benefit Shares derived from EUROMOD simulations, suffer from limited time coverage (2007–2019), beginning with the Global Financial Crisis and excluding the post-pandemic period. Such constraints render them unsuitable for a long-horizon cross-country analysis. The Gini-based measure therefore provides the most consistent and sufficiently long time series for the purposes of this paper.

At the same time, the design of redistribution may matter as much as its aggregate intensity. The Gini-based approach assigns equal weight to all parts of the income distribution and may therefore be less sensitive to changes at the lower and upper tails (Wood, 2020; Berisha and Meszaros, 2018; De Vita and Luo, 2021). This limitation is particularly relevant in the context of household debt, as low-income households are typically the most constrained when debt-service burdens rise (Korinek and Simsek, 2016; Bahadir, De and Lastrapes, 2020). To capture redistribution targeted toward the most vulnerable groups, the analysis additionally incorporates a Palma-based measure, defined as the difference between pre-tax and post-tax Palma ratios. The Palma ratio—measuring the income share of the top 10 percent relative to that of the bottom 40 percent—focuses explicitly on distributional changes at the extremes (Cobham and Sumner, 2014). Using both Gini-based (overall) and Palma-based (top-to-bottom) redistribution measures allows the analysis to distinguish between broad-based redistributive intensity and redistribution concentrated at the tails of the income distribution. This dual approach enables a comprehensive assessment of how both the level and the design of fiscal redistribution condition the consumption response to household debt shocks.

Finally, following Brambor, Clark and Golder (2006), the interaction-based framework is used to compute conditional marginal effects of household debt shocks across the observed distribution of redistribution. The inclusion of quadratic interaction terms makes it possible to test whether the stabilizing role of redistribution strengthens, weakens, or reverses at higher levels of redistribution intensity, thereby directly evaluating the presence of non-linear moderating effects.

Instead of presenting conventional impulse-response functions, the results are reported as conditional marginal effects of a one-standard-deviation household debt shock on consumption, evaluated across different levels of fiscal redistribution displayed on the horizontal axis. For each horizon, the marginal effect is calculated over the entire observed distribution of redistribution levels in the sample. The figures therefore display how the consumption response to a debt shock changes as redistribution increases, with confidence intervals constructed following Brambor, Clark and Golder (2006) to ensure correct inference for interaction terms. This visualization highlights whether the moderating effect of redistribution is linear or exhibits non-linear patterns across its range. To account for redistribution design, two complementary measures are employed. Overall redistribution is defined, following Berg et al. (2018), as the difference between the pre-tax and post-tax Gini coefficients, corresponding to the Reynolds-Smolensky index. This measure captures broad redistributive intensity across the entire income distribution. In contrast, top-to-bottom redistribution is measured as the difference between the pre-tax and post-tax Palma ratios, focusing explicitly on the income gap between the top 10 percent and the bottom 40 percent of households. While the Gini-based measure reflects general redistribution intensity, the Palma-based measure isolates redistribution concentrated at the tails of the distribution, where low-income households most exposed to debt-service pressures are located. Using both indicators allows the analysis to assess whether the moderating effect of redistribution depends not only on its intensity but also on its distributional focus. The dynamic effects are examined across selected horizons, and robustness checks assess whether the results remain stable after excluding the Covid-19 period from the sample, which was characterized by exceptional volatility in household debt dynamics that could bias the estimated results.

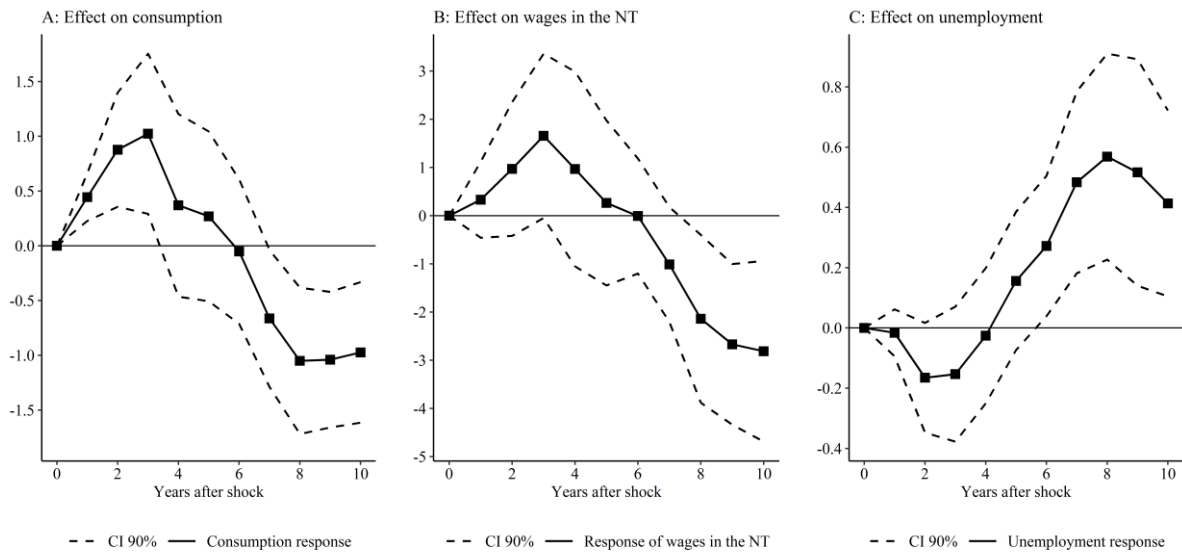
3 Results

The moderating impact of fiscal redistribution is expected to vary across different phases of adjustment following a household debt shock. The subsequent analysis therefore identifies and examines the horizons at which household debt most strongly constrains household budgets. Rather than imposing a single focal period *ex ante*, the empirical framework allows the relevant phases of post-shock adjustment to be evaluated systematically and assesses the moderating role of redistribution within these phases.

The moderating effect is hypothesized to exhibit a hump-shaped pattern across different levels of redistribution intensity. At low levels of fiscal redistribution, the stabilizing capacity of the fiscal system may be insufficient to meaningfully ease the budget constraints of indebted households. As redistribution increases, its consumption-stabilizing effect is expected to strengthen. However, beyond a certain threshold, further expansion of redistribution may generate diminishing marginal benefits due to rising efficiency costs associated with distortionary taxation, as emphasized by Okun’s “leaky bucket” argument and discussed in the redistribution–growth literature (Berg et al., 2018; Barro, 2000). This framework implies that the moderating effect of redistribution increases up to an intermediate level and weakens thereafter.

The empirical strategy proceeds in three steps. First, the baseline effect of household debt shocks on selected variables is estimated without interaction terms in order to document the underlying transmission mechanism. Second, the moderating role of overall redistribution is introduced and compared with the baseline specification. Finally, the analysis turns to top-to-bottom redistribution to assess whether redistribution explicitly targeted toward low-income households, who are particularly vulnerable to income losses during periods of tightening debt-service constraints, influences how household debt shocks translate into changes in household consumption.

Figure 1 Effects of household debt shocks on selected variables (baseline specification)



Note: NT means non-tradable sector and consumption represents household consumption

Consistent with Mian, Sufi and Verner (2017) and Bahadir, De and Lastrapes (2020), the initial phase after the credit expansion is characterized by a temporary increase in household consumption (Figure 1 Panel A), reflecting the relaxation of borrowing constraints and the frontloading of household

demand. This expansionary effect persists for approximately three years following the shock. As households move from the borrowing phase into the repayment phase, the dynamics gradually reverse. From around the fourth horizon onward, the positive consumption response weakens and turns negative after the ninth horizon, with the contractionary effects most pronounced between the fourth and ninth years. This pattern coincides with the rise in debt-service ratios, which tighten households' budgets.

Household debt shocks also affect labor market outcomes and wages. In the initial phase, credit-driven demand creates inflationary pressures and stimulates wage growth, particularly in the non-tradable sector (Figure 1 Panel B), consistent with the mechanism described in Mian, Sufi and Verner (2020). Wages increase until approximately the fourth year after the shock, after which the growth momentum weakens and eventually reverses. As nominal rigidities interact with declining household demand (Figure 1 Panel A), firms adjust through layoffs, resulting in higher unemployment. The unemployment rate peaks around the eighth horizon (Figure 1 Panel C), reflecting the delayed labor market adjustment following the consumption slowdown. These dynamics imply that fiscal redistribution may play a stabilizing role during the phase in which household balance sheet pressures intensify. In particular, redistribution is expected to ease constrained household budgets during the rise and peak of the debt-service ratio (horizons 4-7), when repayment obligations are most binding. Moreover, as the repayment phase is accompanied by rising unemployment and declining wage growth, fiscal redistribution may further moderate the adverse effects of deteriorating labor market conditions on household consumption. The subsequent analysis examines how fiscal redistribution moderates the impact of household debt shocks on household consumption during these periods.

Figure 2 Effect of overall redistribution on consumption after a household debt shock during the debt-service peak

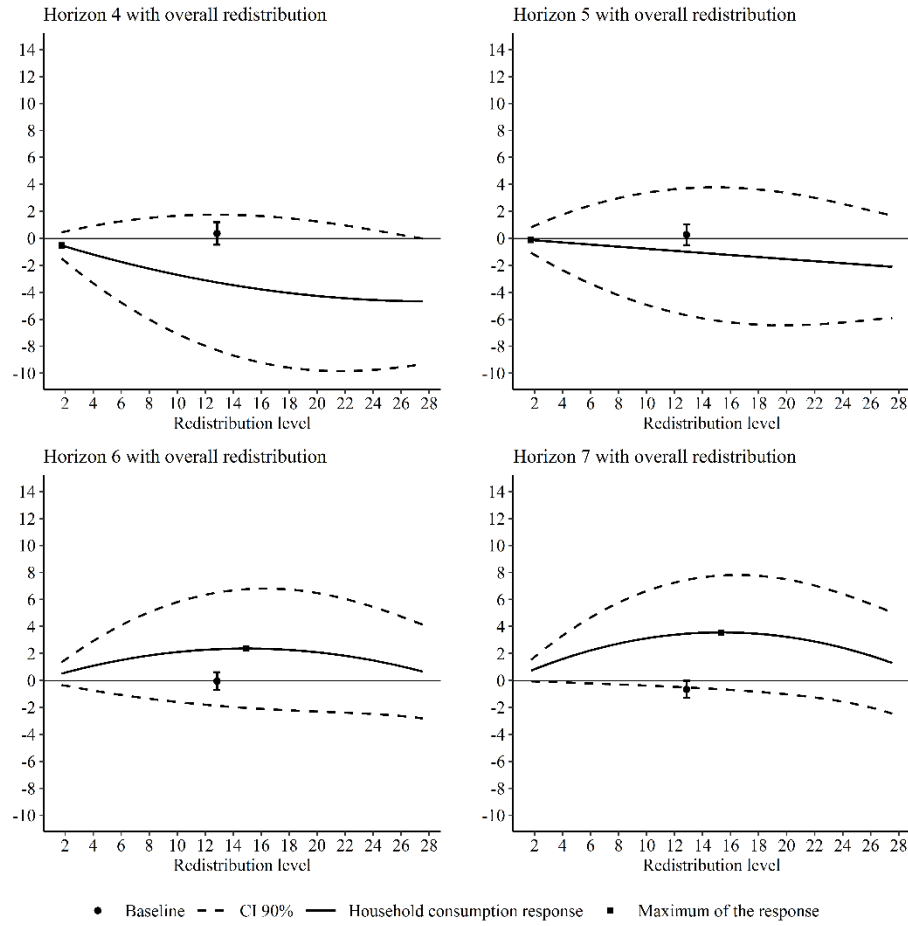


Figure 2 presents the results obtained for overall redistribution during the period of rising and peak debt-service burdens. The figure reports the conditional marginal effects of a household debt shock on consumption and allows for a comparison with the baseline specification at the same horizons, where the baseline response is evaluated at the mean level of overall redistribution.

The results indicate that overall redistribution moderates the adverse effects of household debt shocks at horizons six and seven, corresponding to the peak of the debt-service ratio. During this phase, redistribution appears to provide liquidity support to indebted households, thereby sustaining consumption. However, these findings should be interpreted with caution in cases where the consumption response remains statistically insignificant.

A further key feature of the results is the presence of non-linearity. The consumption response exhibits a hump-shaped pattern across different levels of overall redistribution, with the maximum effect occurring at a redistribution level of approximately 16. The magnitude of the moderating effect is economically meaningful. At the seventh horizon, the estimated marginal effect implies household

consumption that is 4.22 percentage points higher relative to the baseline specification. Given that the standard deviation of consumption growth is 3.06 (see Table 1), this represents a quantitatively substantial effect. Nonetheless, the overall statistical significance remains limited. For this reason, the subsequent analysis shifts attention to the period characterized by the highest unemployment and the lowest wage growth, where redistribution may exert additional stabilizing effects through labor market channels.

Figure 3 Effect of overall redistribution on consumption after a household debt shock during labor market stress phase

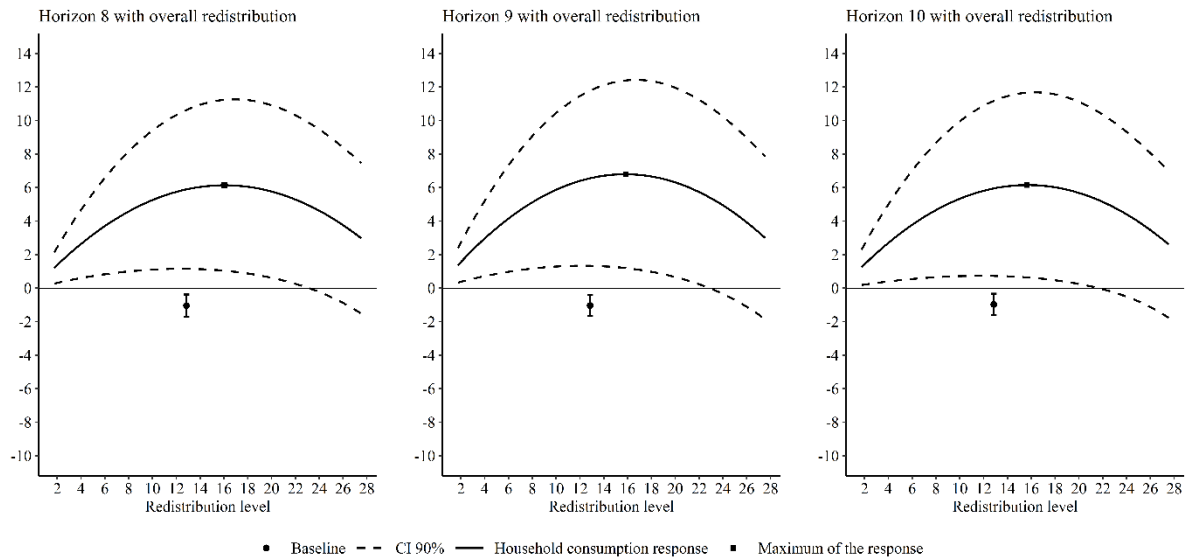


Figure 3 presents the moderating effect of overall redistribution at horizons 8–10, corresponding to the period in which unemployment reaches its peak and wages in the non-tradable sector fall below their pre-shock levels following a household debt shock. Unlike the earlier horizons, where statistical significance effect of redistribution was limited, the moderating effect at horizons 8-10 becomes statistically significant across a substantial range of redistribution levels. This indicates a more robust stabilizing role of redistribution during the phase of pronounced labor market deterioration.

The results suggest that during this period fiscal redistribution operates primarily through income-support mechanisms. Transfers such as unemployment benefits may partially offset income losses associated with rising unemployment and declining wages, thereby helping to sustain household consumption. A clear hump-shaped pattern is again observed, confirming the presence of non-linearity in the moderating effect of redistribution. The stabilizing impact increases with redistribution intensity up to an intermediate level, approximately 16, and declines thereafter. This pattern is consistent with earlier horizons but is now supported by stronger statistical significance. Importantly, the quantitative magnitude of the effect is substantial and exceeds that observed at earlier horizons. The divergence

from the baseline specification is largest at the ninth horizon, where the conditional marginal effect implies that cumulative household consumption is 7.83 percentage points higher relative to the baseline response.

Overall, the results indicate that overall redistribution moderates the adverse effects of household debt shocks, particularly during the repayment phase when debt-service burdens intensify and labor market conditions deteriorate. While the effect at horizons 6–7 is economically meaningful but only weakly supported by statistical significance, the stabilizing role of redistribution becomes statistically significant at longer horizons (8–10), precisely when unemployment reaches its peak and wages in the non-tradable sector fall to their lowest levels. This timing suggests that redistribution likely operates through income-support mechanisms, such as unemployment benefits and related transfers, which partially offset income losses and help sustain household consumption during periods of labor market stress. Across horizons, the moderating effect consistently exhibits a hump-shaped pattern, with the strongest impact occurring at intermediate levels of redistribution, around 16, indicating the presence of non-linearity in the stabilization mechanism.

While the previous results highlight the importance of overall redistribution, the macroeconomic impact of fiscal policy depends not only on its intensity but also on its design. Redistribution that is effectively targeted toward low-income households, who typically exhibit higher marginal propensities to consume and are more vulnerable to income losses during the repayment phase (Bahadir, De and Lastrapes, 2020), may exert a stronger stabilizing effect on economic activity (Christl, De Poli and Köppl-Turyna, 2025). This consideration is particularly relevant at longer horizons, when unemployment peaks and wage growth weakens. To account for this dimension, the analysis replaces overall redistribution with top-to-bottom redistribution, which focuses explicitly on changes at the tails of the income distribution. This specification allows us to assess whether redistribution concentrated on the most vulnerable households alters the transmission of household debt shocks to consumption differently from broad-based redistribution.

Figure 4 Effect of top-to-bottom redistribution on household consumption after a household debt shock during the debt-service peak

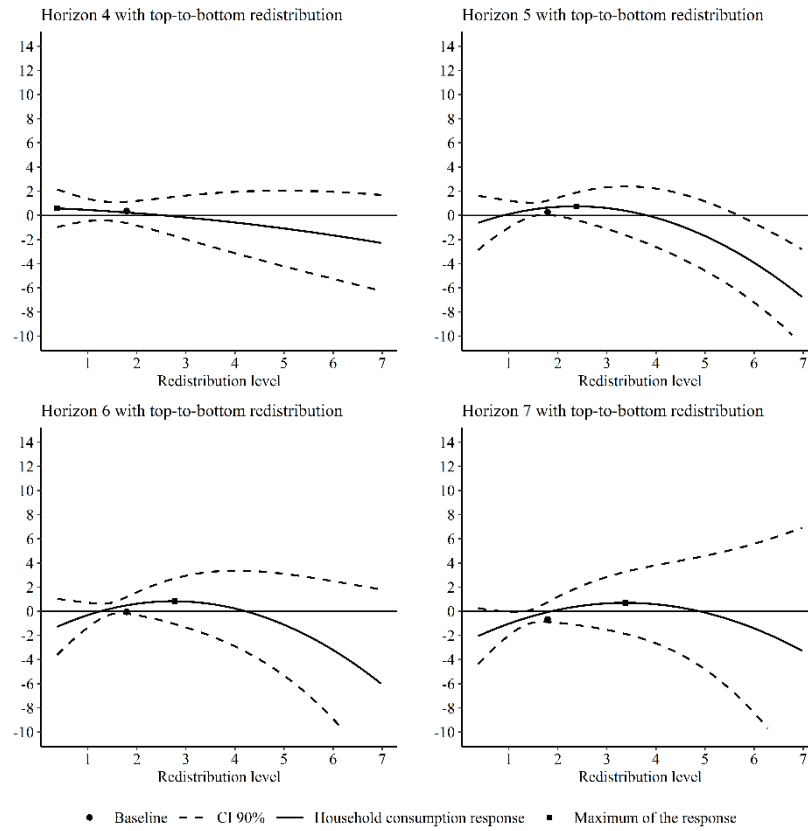


Figure 4 reports the moderating effect of redistribution targeted at the tails of the income distribution, as measured by the top-to-bottom indicator, at horizons 4-7. Similar to the results obtained for overall redistribution, the moderating effect of top-to-bottom redistribution is statistically insignificant across all examined horizons. In addition, the magnitude of the estimated effects is modest. Even at its maximum, observed at the seventh horizon, the conditional marginal effect reaches only 1.36 percentage points. This value is substantially smaller than the corresponding effect estimated for overall redistribution and remains statistically insignificant.

Overall, the evidence indicates that redistribution concentrated at the extremes of the income distribution does not meaningfully alter the transmission of household debt shocks to household consumption during the debt-service peak. Compared to overall redistribution, its stabilizing capacity appears weaker in magnitude and, similar to overall redistribution at these horizons, lacks statistical support.

Figure 5 Effect of top-to-bottom redistribution on consumption after a household debt shock during labor market stress phase

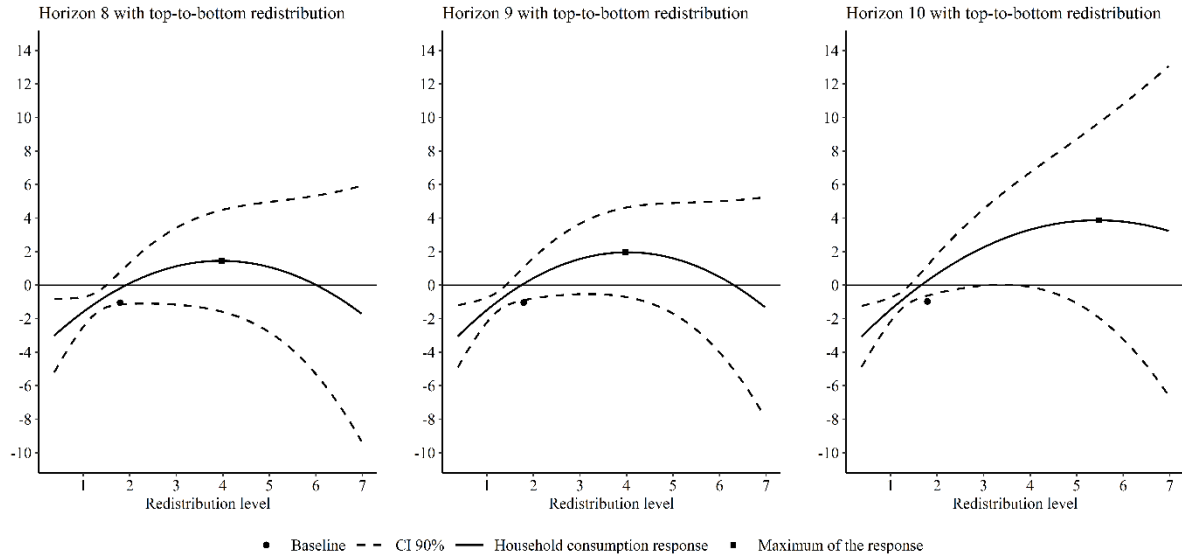


Figure 5 presents the moderating effect of top-to-bottom redistribution at horizons 8-10, corresponding to the period in which unemployment peaks and wages in the non-tradable sector fall below their pre-shock levels. In contrast to the results obtained for overall redistribution at these horizons, the moderating effect of redistribution targeted at the tails of the income distribution remains statistically insignificant across most redistribution levels. Notably, at lower levels of redistribution, the estimated marginal effect is negative, indicating that limited tail-targeted redistribution may be insufficient to counteract income losses during the repayment phase and may even be associated with weaker consumption outcomes relative to the baseline. This pattern stands in contrast to the results for overall redistribution, where the stabilizing effect becomes statistically significant at longer horizons.

Although a hump-shaped pattern is again observable, confirming the presence of non-linearity in the estimated relationship, the effect lacks statistical significance across the relevant range of redistribution levels. Taken together, the evidence suggests that redistribution explicitly concentrated at the extremes of the income distribution does not provide measurable stabilization of household consumption in the aftermath of a household debt shock. Moreover, at low levels, its limited scale appears insufficient to offset balance sheet pressures, leaving consumption particularly vulnerable during periods of labor market deterioration.

To ensure that the results are not driven by the exceptional dynamics observed during the Covid-19 period, an additional robustness check is performed excluding the post-2019 observations. The pandemic was characterized by an extraordinary surge in household indebtedness followed by rapid

deleveraging (Boone et al., 2022). These extreme fluctuations may distort the estimated relationship between household debt and consumption. Re-estimating the models without the Covid-19 episode allows us to assess whether the identified moderating effects of redistribution persist under more typical macroeconomic conditions.

Figure 6 Effect of overall redistribution on consumption after a household debt shock during the debt-service peak before Covid-19

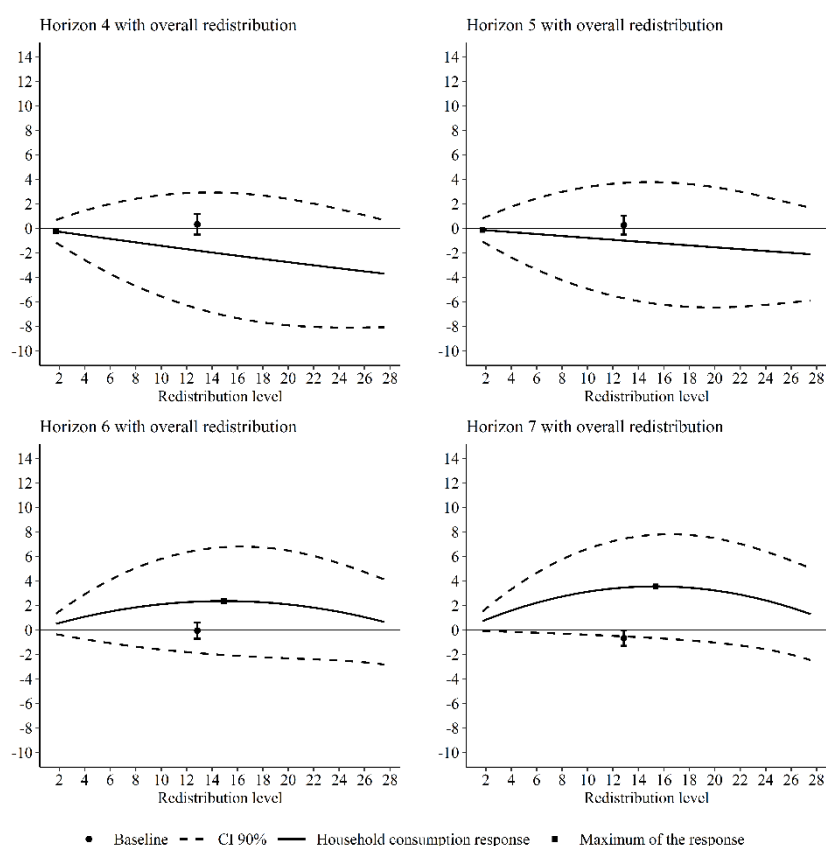


Figure 7 Effect of overall redistribution on consumption after a household debt shock during labor market stress phase Covid-19

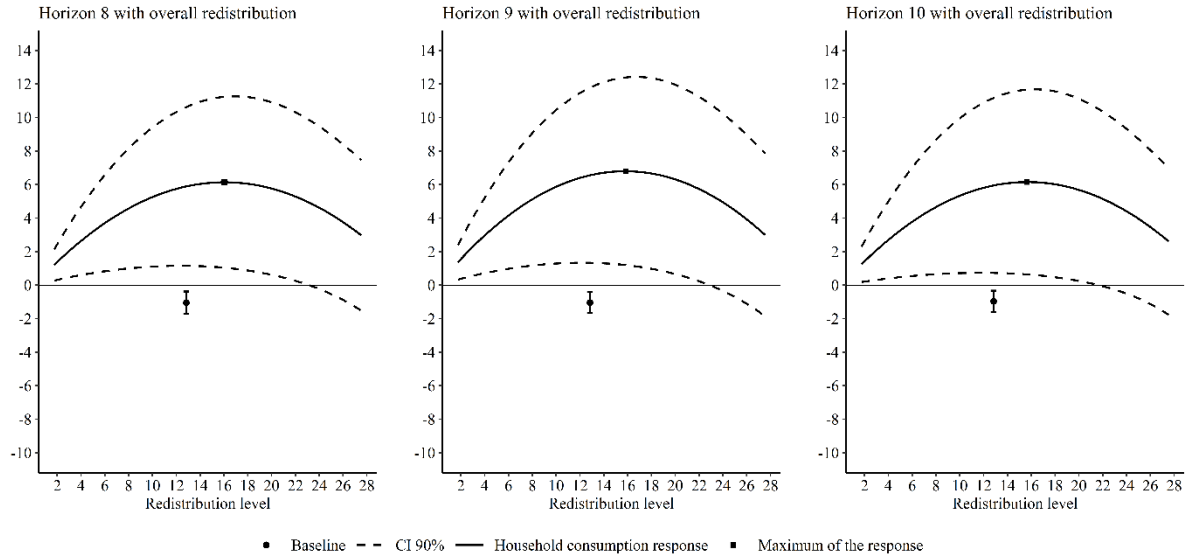


Figure 8 Effect of top-to-bottom redistribution on consumption after a household debt shock during the debt-service peak before Covid-19

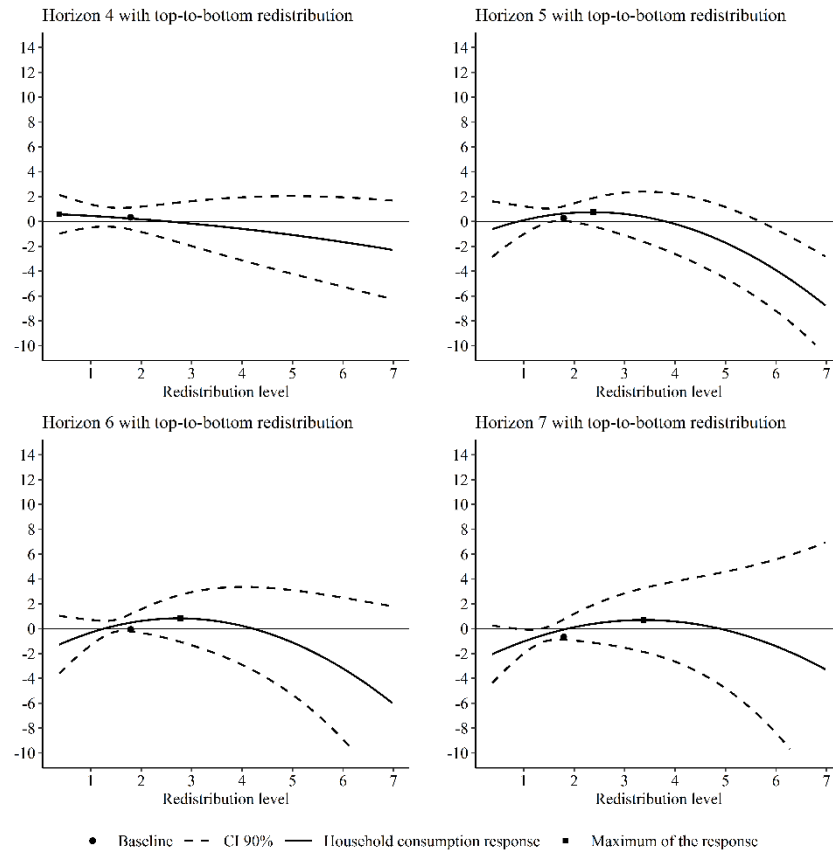
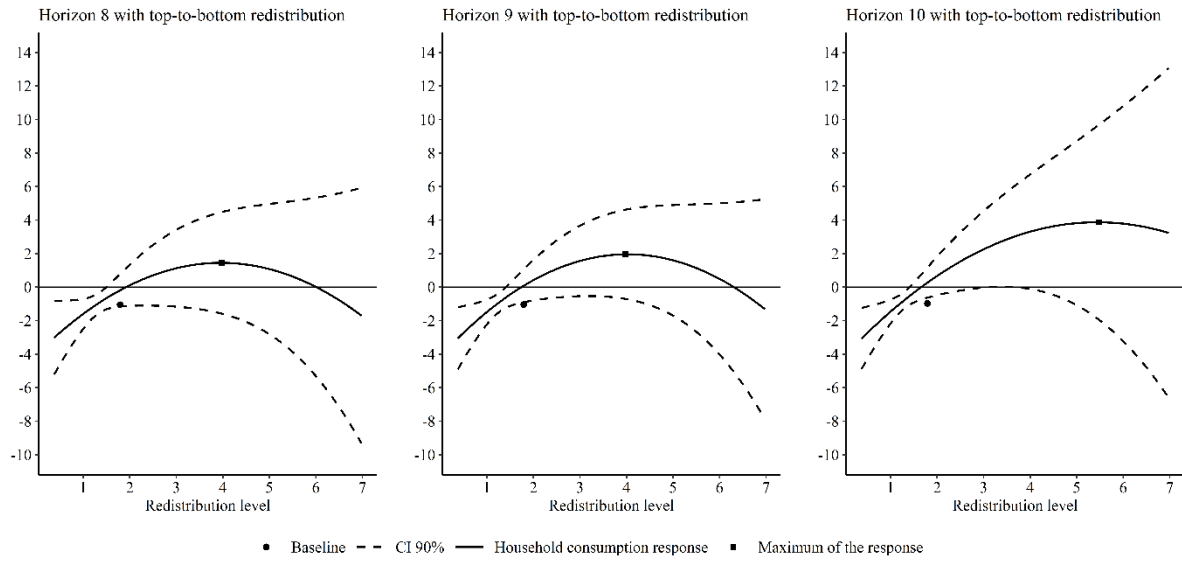


Figure 9 Effect of top-to-bottom redistribution on consumption after a household debt shock during labor market stress phase Covid-19



The results remain qualitatively unchanged after excluding the Covid-19 period, indicating that the findings are robust to the removal of this highly volatile episode. The hump-shaped non-linearity of overall redistribution persists, and its stabilizing effect remains statistically significant at longer horizons (8–10). In contrast, redistribution targeted at the tails of the income distribution (top-to-bottom) continues to be statistically insignificant across horizons and even exhibits negative marginal effects at low levels of redistribution. These findings confirm that the main conclusions are not driven by pandemic-specific debt dynamics but reflect a broader and stable macroeconomic relationship.

Discussion

The results provide several insights into the interaction between household debt, fiscal redistribution, and household consumption dynamics. First, the findings confirm the presence of a non-linear (hump-shaped) moderating effect of overall redistribution. The stabilizing impact of redistribution increases with its intensity up to an intermediate level of approximately 16 and declines thereafter. This pattern is broadly consistent with the redistribution–growth literature. Berg et al. (2018) document that redistribution begins to exhibit adverse growth effects at levels above roughly 13 when measured in a comparable manner. The slightly higher turning point identified in the present paper may reflect differences in model specification and the set of explanatory variables employed across studies.

Second, the timing of the stabilizing effect differs across phases of adjustment. During the debt-service peak (horizons 4–7), overall redistribution produces economically meaningful but only weakly significant effects. In contrast, during the labor market stress phase (horizons 8–10), when

unemployment peaks and wages in the non-tradable sector fall below pre-shock levels, the moderating effect becomes statistically significant and quantitatively stronger. The largest divergence from the baseline occurs at the ninth horizon. This timing suggests that redistribution operates primarily through income-replacement mechanisms. Transfers such as unemployment benefits and related social assistance programs appear particularly effective when labor income deteriorates, rather than during the initial tightening of debt-service constraints alone.

Third, redistribution targeted at the tails of the income distribution (top-to-bottom) does not exhibit a statistically significant stabilizing effect at any horizon. At low levels of such redistribution, the marginal effect is even negative. This finding contrasts with Christl, De Poli and Köppl-Turyna (2025), who argue that well-targeted redistribution toward low-income households can be especially growth-supportive. However, our results align closely with Škára and Grochová (2025), who show that overall redistribution is more effective in moderating the macroeconomic consequences of household debt.

Taken together, the results suggest that the effectiveness of fiscal redistribution depends primarily on its intensity and exhibits a clear non-linear pattern. The stabilizing impact on household consumption strengthens as redistribution increases up to an intermediate level and weakens beyond that point, indicating diminishing marginal benefits at higher levels. Moreover, broad-based (overall) redistribution proves more effective in moderating the consumption effects of household debt shocks than redistribution targeted solely at the tails of the income distribution. Redistribution therefore stabilizes consumption only within a certain range of intensity and primarily when implemented in a broad-based manner.

Conclusion

This paper examined whether fiscal redistribution moderates the consumption effects of household debt shocks and whether this moderating role is non-linear. Using panel local projections for 31 countries over the period 1980–2023, the analysis distinguished between two post-credit adjustment phases: the debt-service peak (horizons 4–7) and the subsequent labor market stress phase (horizons 8–10).

The results reveal a clear hump-shaped non-linearity in the moderating effect of overall redistribution. The stabilizing impact on household consumption increases with redistribution intensity up to an intermediate level of approximately 16 and declines thereafter, indicating diminishing marginal benefits at higher levels. The weakening of the effect beyond this threshold may reflect rising efficiency costs associated with extensive redistribution. In particular, mechanisms such as Okun’s “leaky

bucket”, emphasizing distortions from taxation and administrative inefficiencies, or Ricardian-type behavioral responses may attenuate the net stabilizing impact at very high levels of redistribution. This finding extends the redistribution literature by demonstrating that non-linearity characterizes not only long-run growth outcomes but also the short- and medium-run stabilization of household demand following debt shocks.

Importantly, the effectiveness of redistribution differs across adjustment phases. While the moderating effect during the debt-service peak is economically meaningful but only weakly significant, redistribution becomes statistically significant and quantitatively stronger during the labor market stress phase, when unemployment rises and wages decline. This timing suggests that fiscal redistribution operates not only by easing debt-service pressures but also through income-replacement mechanisms during periods of labor market deterioration.

In contrast, redistribution concentrated solely at the tails of the income distribution does not provide measurable stabilization of consumption. Broad-based redistribution proves more effective in moderating the adverse consumption effects of household debt shocks.

From a policy perspective, these findings imply that fiscal redistribution can enhance macroeconomic resilience in the aftermath of household credit booms, particularly when labor market conditions deteriorate. However, its effectiveness depends critically on both its intensity and its design. Redistribution that is narrowly targeted at the tails of the income distribution appears insufficient to provide meaningful stabilization, especially at low levels of redistribution. In contrast, broad-based (overall) redistribution demonstrates a stronger and more consistent moderating effect on household consumption. At the same time, excessively high levels of redistribution may yield diminishing returns, consistent with potential efficiency costs. Broad-based income-support mechanisms, particularly those operating automatically during periods of rising unemployment, therefore appear especially important for cushioning household consumption after household debt shock.

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