Dynamic Responses of Income Inequality to Fiscal Shocks

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Preliminary draft: November 7, 2024

Abstract

This paper examines fiscal consolidations' impacts on income inequality in advanced and emerging economies. Using data from 31 countries (1980-2016), it employs local projections to analyze how expenditure and tax consolidations affect income distribution. The findings indicate that fiscal consolidations typically increase income inequality, benefiting the top 1% at the bottom 50% and the middle 40% expense. Credit access is a mechanism that amplifies these effects, with more pronounced inequality in advanced economies and nuanced impacts in emerging ones. Capital accumulation counteracts the impact of fiscal consolidations on income inequality, especially for emerging economies after a tax consolidation. This study underscores the importance of understanding how fiscal policy choices influence income inequality through fiscal consolidation, mediated by access to credit, and capital accumulation.

1 Introduction

It is well established in the literature that fiscal policy has a direct impact on income inequality (Alesina and Rodrik, 1994, Perotti, 1996, Sinn, 1996)[1], and therefore on economic growth (Bourguignon, 1981, Galor and Zeira, 1993, Kaldor, 1955, Kuznets, 1955). Recent access to comparable data sets on income inequality and subsequent findings on the impact of income inequality on the world have fueled a resurgence of this topic in the literature (Atems, 2018, Atems and Jones, 2015, Atkinson, 2015, da Silva, 2020, Geiger et al., 2020, Muinelo-Gallo and Roca-Sagalés, 2013, Piketty and Saez, 2003, Woo, 2011, 2020). Furthermore, new information on fiscal consolidation announcements and their budgetary impact has become available as exogenous shocks to study their impact on macroeconomic aggregates (Alesina et al., 2015a,b, Beetsma et al., 2021, Carrière-Swallow et al., 2021, David et al., 2022, 2024, Devries et al., 2011, Guajardo et al., 2014, Romer and Romer, 2010).

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[1]See Gemmell (2001) for a brief overview of this literature

The recent availability of data on fiscal consolidations and income inequality provides a unique opportunity to understand the impact of fiscal shocks, more precisely fiscal consolidations, and its transmission channels on income inequality.

This paper sheds light on the impact of fiscal consolidations on income inequality and some of the transmission channels of the effects across different economies. I focused on two related transmission channels: credit channels and capital accumulation channels. I select these two types of channels following Galor and Moav (2004) where they find that, depending on the development stage of the economy, a policy maker could foster or not income inequality in order to foster economic growth. For example, in the early stages of development, the accumulation of physical capital was the main source of growth. Thus, funneling available resources to individuals with a higher propensity to save (that is, generating more income inequality) could lead to more economic growth (Bourguignon, 1981, Kaldor, 1955). In contrast, in later stages of development, the accumulation of human capital emerged as the main source of growth. Reducing income inequality could potentially reduce the effects of credit constraints on the accumulation of human capital, thus fostering growth (Galor and Zeira, 1993). In this sense, one could expect that the effect of fiscal consolidation on income inequality would be different for advanced economies (AE) and emerging economies (EME).

The interaction between fiscal policy and income inequality is influenced by its effects on household disposable income, consequently affecting income distribution. Fiscal policies that alter taxation, whether through increases or cuts, have an impact on this distribution based on the regressive or progressive nature of tax changes, thus affecting various segments of the income spectrum (Duncan and Peter, 2016). Transfers or negative taxes also modify the income distribution by influencing savings rates and addressing credit constraints (Galor and Zeira, 1993, Perotti, 1996). Specifically, Perotti (1996) indicates that fiscal policies frequently tend to redistribution, since payments correlate proportionally with individual income. However, although redistributive policies improve equity, they can concurrently impede economic growth by diminishing incentives for private savings and investment. Consistent with this view, Alesina and Rodrik (1994) contends that in more equitable societies, there is a reduced demand for redistribution, leading to lower taxation, increased investment, and greater growth.

Fiscal policy influences factor accumulation both indirectly, by modifying the incentives for private investment, and directly through public investment (King and Rebelo, 1990, Lucas, 1988, Mendoza et al., 1997, Rebelo, 1991, Stokey and Rebelo, 1995). However, extensive government intervention can block private investment, which adversely affects long-term growth (Barro, 1990, Devarajan et al., 1996, Milesi-Ferretti and Roubini, 1998). In addition, government expenditure has an impact on inequality through various mechanisms. Expenditures on health and education mitigate inequality by enhancing human capital, which is a crucial driver of inclusive growth (Galor and Moav, 2004, Galor and Zeira, 1993, Gründler and Scheuermeyer, 2018). Although infrastructure spending may initially reduce inequality, it could potentially increase inequality in the long run due to the taxation required to finance such projects (Chatterjee and Turnovsky, 2012). Moreover, budget deficits that are not neutralized by Ricardian equivalence have the potential to decrease savings and impede growth, with possible consequences for inequality (Gemmell, 2001). Social protection expenditures, designed to protect against risks that private agents cannot mitigate, contribute to reducing inequality by sustaining income-generating activities for vulnerable households (Sinn, 1996).

All of the above suggests that one can identify the dynamic response of income inequality to fiscal policy shocks. Specifically, given a fiscal policy shock, agents will adapt their behavior via both factor accumulation due to credit constraints becoming less binding and via changing their consumption preferences due to a different economic perspective. This, in turn, will impact how income is distributed in the economy. The main issue is to have exogenous fiscal policy shocks in the sense that they are not anticipated by the agents in the economy. Hence, these shocks have to comply with Ramey (2016)'s three characteristics: i) exogenous to current and lagged endogenous variables, ii) uncorrelated with other exogenous shocks, and iii) represent either unanticipated movements in exogenous variables or news about future movements of exogenous variables (p.75).

I used fiscal consolidation announcements that have been used as exogenous fiscal policy shocks to estimate fiscal multipliers and impacts on other macroeconomic aggregates (Alesina et al., 2015a,b, Beetsma et al., 2021, Carrière-Swallow et al., 2021, David et al., 2022, 2024, Devries et al., 2011, Guajardo et al., 2014, Romer and Romer, 2010). Consequently, this study is in line with the literature on narrative methods as an identification strategy (Ramey, 2016). Specifically, I use Devries et al. (2011) and Carrière-Swallow et al. (2021) narrative fiscal consolidation announcements and their budgetary impacts. The former includes yearly information for 17 advanced economies for the period 1980 and 2009, and the latter includes 14 emerging economies for the period 1989 and 2016.[2] More importantly, these two series have a consistent identification of fiscal consolidation and its budgetary impact. A word of caution about the budgetary impact is in order. The budget impact is rarely available retrospectively (Devries et al., 2011, Romer and Romer, 2010). The recent literature combines ex ante forecasts and real-time estimates of the impact on the primary balance (Beetsma et al., 2021, David et al., 2024). For this reason, I worked with indicator variables of the date of the announcements instead of the budgetary impact size.

Fiscal consolidations, defined as policies aimed at reducing government deficits through spending reductions or tax increases, could have a negative impact on income inequality. Empirical analysis suggests that these consolidations actually have a statistically significant impact on inequality, as they tend to diminish the income shares of the lower portions of the income distribution while disproportionately benefiting the upper portion of it. For example, expenditure consolidations typically lead to a reduction in the income share of the bottom 50% (that is, 0 to the 50th percentile) and the middle 40% (that is, the 50th to the 90th percentile), whereas the top 1% has substantial income share gains. Likewise, tax consolidations reallocate income distribution favorably towards the upper portion of the income distribution, further expanding the income divide. These effects are particularly pronounced in advanced economies, where fiscal consolidations have a more significant impact on income inequality.

The effects of fiscal consolidations on income inequality differ between various types of economies. In advanced economies, both expenditure and tax consolidations markedly decrease the income shares of the lower portion of the income distribution, while the top 1% experience significant gains. In contrast, emerging economies present more heterogeneous outcomes. Although expenditure consolidations exert a less pronounced effect on income distribution in these nations, tax consolidations can occasionally result in modest increases in the income share of the bottom 50%. However, the trend in both advanced and emerging economies is that fiscal consolidations generally intensify income inequality.

I analyzed how two types of channels can affect the dynamic response of income inequality to different fiscal consolidations. First, the channel of credit constraints could potentially affect the

[2] The advanced economies are: Australia, Austria, Belgium, Canada, Germany, Denmark, Spain, Finland, France, Great Britain, Ireland, Italy, Japan, Netherlands, Portugal, Sweden, and United States. Emerging economies are the following. Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Jamaica, Mexico, Peru, Paraguay and Uruguay

transmission of fiscal consolidations on income inequality. This channel functions through the credit limitations imposed on private agents, thus restricting their ability to access productive investments. During fiscal consolidations, particularly through changes in taxation, the disposable income of the household changes. In this sense, credit access could play a dual role during fiscal consolidations. On the one hand, increased access could potentially smooth the reduction of disposable income of those households affected by fiscal consolidation. Thus, one could expect that in economies with larger access to credit, it could potentially reduce or cancel out the adverse effects of fiscal consolidation on income inequality, whereas those with reduced access could increase income inequality. On the other hand, increased credit access could potentially increase income inequality, since credit access is not necessarily used by lower-income households due to lack of collateral (Beck et al., 2007). The analysis suggests that the latter effect takes place: fiscal consolidations, accompanied by increased credit access, lead to higher income inequality. In advanced economies, the impacts of easing credit constraints (that is, increasing the size of domestic credit to the private sector) are more pronounced toward increases in income inequality. That is, fiscal consolidations resulting in lower income shares of the bottom 50% and middle 40% groups while increasing the income share of the top 1%. In contrast, in emerging economies, while credit constraints tend to be more stringent, the impact of fiscal consolidations on income inequality is comparatively less pronounced. However, for a tax consolidation, there is an increase in the income share held by the bottom 50% that could suggest a reduction in income inequality.

The capital accumulation channel could potentially constitute a mechanism through which fiscal consolidations impact income inequality. This channel functions through both private and public investments. Fiscal consolidations, particularly through reductions in expenditure, may result in decreased public investment in infrastructure and other capital-intensive projects, as well as investments in the social protection net. Public investment usually leads to crowding-out effect that can impair long-term economic growth and intensify income inequality. Furthermore, private capital accumulation, closely related to household savings rates, typically increases with higher household income. Consequently, fiscal consolidations tend to impose a greater burden on lower-income groups, whereas higher-income groups, who already possess superior access to savings and investment opportunities, benefit from augmented returns on capital. In the case of tax consolidations, changes in disposable income could lead to two potential effects depending on the regressivity of the consolidation. In the first place, it could lead to an increase in income inequality due to the lack of disposable income by households to invest in capital accumulation activities, or it could transfer income for income-constrained households to invest in capital accumulation both in physical capital or in human capital, thus reducing income inequality. The evidence suggests that the capital accumulation channel matters in reducing income inequality. It seems to be more relevant in Emerging Economies than in Advanced Economies, and it is more relevant in tax consolidations than in expenditure consolidations.

This paper is related to the literature that looks at the impact of fiscal policy, in particular fiscal consolidations, on macroeconomic variables as in Alesina et al. (2015b), Beetsma et al. (2021), Carrière-Swallow et al. (2021), Cevik and Correa-Caro (2020), David et al. (2022), Devries et al. (2011), Muinelo-Gallo and Roca-Sagalés (2013), Woo (2011), and this paper aims at the impact on income inequality. Furthermore, this paper is embedded in the literature that looks at the nexus between income inequality and the financial system as in Beck et al. (2007), Chiu and Lee (2019), Duncan and Peter (2016), Gründler and Scheuermeyer (2018), Jeong and Kim (2018), Sotiropoulou et al. (2023), Weychert (2020). Additionally, this article belongs to the literature that focuses on capital accumulation and inequality as in Galor and Moav (2004), Hai and Heckman (2017).

The remainder of this paper is divided as follows. Section 2 presents and summarizes the data used for the analysis. Section 3 presents the effects of fiscal consolidation on income inequality, while Section 4 discusses the two main channels: credit constraints and capital accumulation. Section 5 concludes.

2 Data, Summary Statistics and Data Preparation

2.1 Data

This section presents the data used for the analysis of the dynamic response of income inequality to fiscal shocks. The data consists of annual data between 1980 and 2016. The data covers 31 countries divided, according to the IMF Fiscal Monitor, into two categories: advanced economies (17) and emerging economies (14). In total, there are 871 country-year observations. In all estimations, I include the real GDP per capita in US dollars in 2017 as a measure of the level of economic activity of the country taken from the Penn World Table.

The fiscal consolidation announcement data contain the year of the fiscal consolidation as well as if was tax or expenditure-related and their size as a share of GDP. The data comes from two sources. Devries et al. (2011) for 17 advanced economies from 1980 to 2009, and Carrière-Swallow et al. (2021) for 14 emerging economies in Latin America and the Caribbean between 1989 and 2016. Devries et al. (2011) records fiscal actions that aimed primarily at reducing budget deficits. They follow Romer and Romer (2010) to estimate the budgetary impacts of the fiscal consolidation measures and recorded them in the year they came into effect. Carrière-Swallow et al. (2021) follow a similar strategy for their country sample, where they claimed that such actions are unlikely to be systematically correlated with other economic developments in the short term. This implies that they can be treated as exogenous shocks that can help to establish a causal link between fiscal policy and changes in income inequality.

Also, I use the WID data on the income share held by the bottom 50% (BOT50), middle 40% (MID40), and top 1% (TOP1), which is the share held by the corresponding percentile of pre-tax income, including social insurance benefits (without the corresponding contributions) and excludes other forms of redistribution (i.e., income tax, social assistance benefits, among others).

For the proxy of credit constraints, I will use the different variables from the World Bank's Global Finance Development Database. The first is the debt to the private sector as a share of the GDP. This variable directly measures the size of the credit market for private agents in the economy, which an increase or decrease suggests a measure of how binding or not the credit constraint is for households and firms. A second measure is liquid liabilities as a share of GDP. This variable is also known as broad money, which measures the size, relative to the economy, of financial intermediaries (that is, central bank, deposit money banks, and other financial institutions). An increase in the size of financial intermediaries suggests increased access to credit and reduced credit restrictions for households and firms.

For the proxy of capital accumulation, I will use different variables. First, I use real capital stock per capita as a measure of capital accumulation. The interpretation of this variable is straightforward, as an increase in it suggests an increase in factor accumulation on the part of the private agents in the economy. Second, I will use the human capital index from the World Penn Tables. This variable is a combination of years of schooling and the returns to education from traditional mincer equations.

Table 1: Summary Statistics for Selected Variables

Variable	Mean	Standard Deviation	Observations
Expenditure Consolidation[a]	0.72	0.66	170
Tax Consolidation[a]	0.50	0.69	206
Credit to Private Sector (Share of GDP)	65.07	48.99	576
Liquid Liabilities (Share of GDP)	56.62	34.69	847
Real GDP per Capita	24,876.60	13,823.36	871
Real Capital Stock per Capita	129,227.76	82,015.71	871
Human capital index	2.76	0.48	871
Income Share Bottom 50%	16.34	7.07	871
Advanced Economies	21.94	3.51	493
Emerging Economies	9.04	2.15	378
Income Share Middle 40%	41.56	6.09	871
Advanced Economies	46.07	2.87	493
Emerging Economies	35.68	3.69	378
Income Share Top 1%	14.01	6.01	871
Advanced Economies	9.60	2.65	493
Emerging Economies	19.75	3.95	378

Source: Carrière-Swallow et al. (2021), Devries et al. (2011), Penn World Tables, WID, World Development Indicators, Global Finance Development Database and Global Finance Statistics.

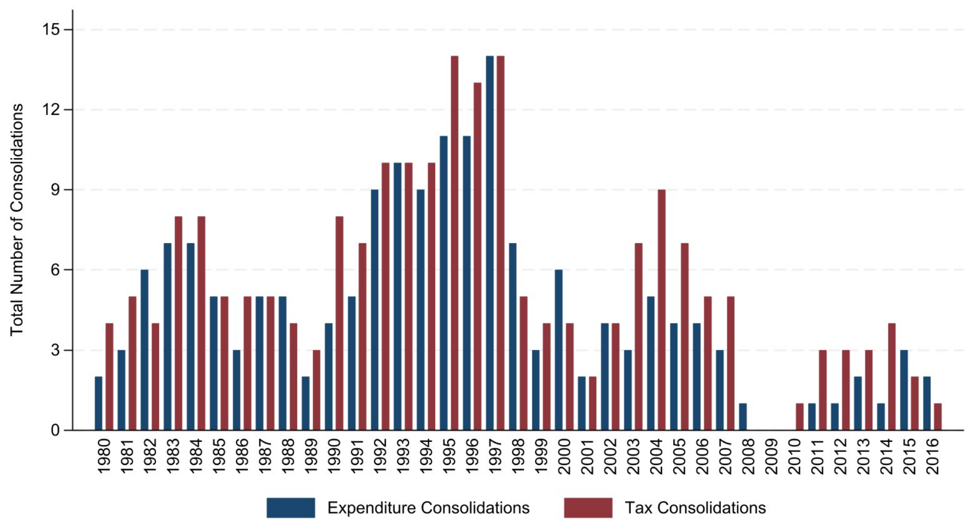
a. Conditional on fiscal consolidation taking place.

2.2 Summary of Selected Variables

Table 1 presents the summary statistics for the selected variables. The expenditure consolidation and the tax consolidation are estimated conditional on their value being different from zero. This condition implies that there are 170 (206) observations in which an expenditure consolidation (tax consolidation) took place in the sample. Figure 1 presents the total number of expenditure (blue) and tax (red) consolidations for the period. One can see that these consolidations are distributed throughout the period. The maximum number (14) of consolidations occurred in 1997 for both types of fiscal consolidation. There were no consolidations in 2009, during the crisis. Figures 11 and 12 in Appendix A show the different consolidations by country.

Fiscal consolidations varied in size over time. Figure 2 presents the distribution of expenditure consolidation (left) and tax consolidation (right) over the studied period. The median size for the expenditure consolidation ranged from 0.07% to 1.3% of GDP in the period, while for the tax

Figure 1: Total Number of Fiscal Consolidations over Time



Source: Carrière-Swallow et al. (2021), Devries et al. (2011)

consolidations it ranged from 0. 11% to 1. 8% of GDP.

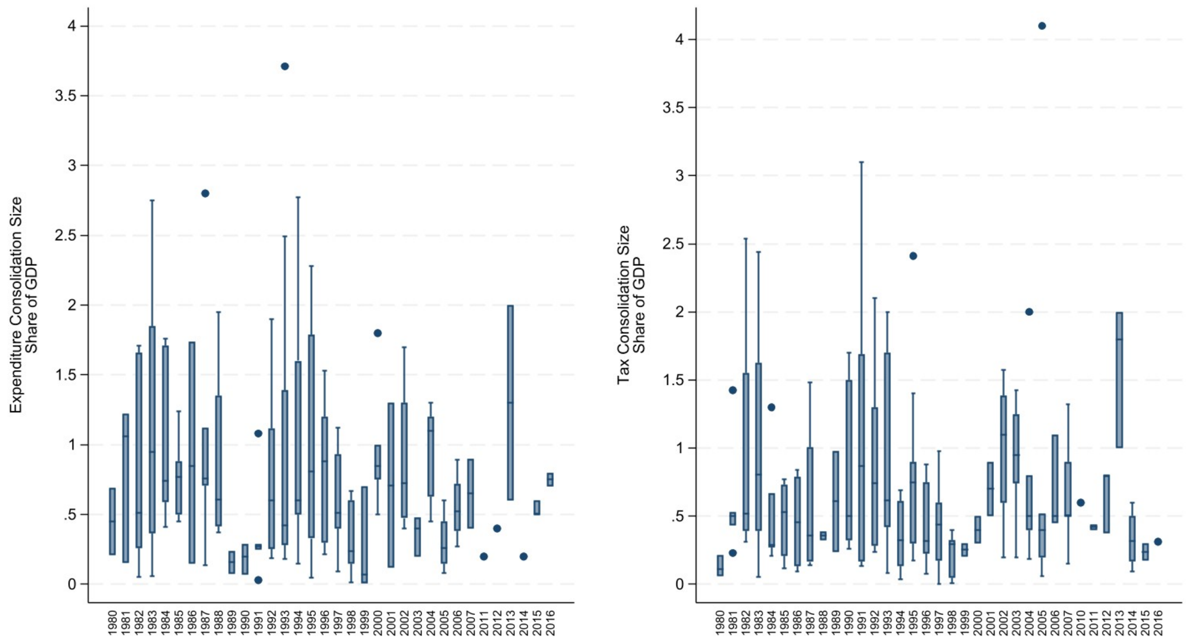
In terms of income inequality measures, around 17.6% of the income was held by the bottom 50% of the distribution and around 42.5% of the income was held by the middle 40% of the distribution, while 13.1% was held by the top 1% of the distribution. There are important differences between country types. For example, for AE the bottom 50% held 21% of the income while for EME this is only around 9%. In contrast, the top 1% holds only about 10% of the income share in the AEs and around 20% in the EMEs.

In terms of credit constraints, domestic credit to the private sector was on average around 71.16% of the GDP, while liquid liabilities are around 62.25% of GDP. In terms of capital accumulation, the real capital stock is around 6,468 million US dollars, and the human capital index, which is a measure that combines the number of years of schooling and the assumed rate of return to education, is around 2.87 on average across the sample.

2.3 Data Preparations

I transform the real GDP per capita and the real capital stock per capita into logs. The income inequality variables are left in their original units, since the Gini is already normalized between 0 and 1, and the remaining are income shares in percentages. Leaving the income inequality

Figure 2: Size of Fiscal Consolidations over Time



Source: Carrière-Swallow et al. (2021), Devries et al. (2011)

variables as it eases the interpretation.[3] Similarly, the credit constraint variables and remaining capital accumulation variables are left as is because they are shares of GDP (credit to the private sector and liquid liabilities), rates (internal rate of return) and indexes (human capital index). I demean the variables that will also serve as a capture country fixed effects and perform the analysis in first differences to account for the trend[4]

2.4 Addressing Concerns about Anticipation of Fiscal Consolidations

A primary concern is whether fiscal consolidation announcements are driven by changes in inequality pressures in the short term. That is, whether growth in income inequality could lead to fiscal consolidation in the next four years.[5] Carrière-Swallow et al. (2021) suggested that fiscal policy

[3]I also estimate the results below with the log difference of the income shares, with similar qualitative results.

[4]I have performed an unit root test on the variables in the Appendix B. They confirm that demeaning allows for stationarity of the variables.

[5]The time period is chosen arbitrarily. However, given that most of our sample has a four-year term for its main executive branch, a four-year period is a reasonable time horizon for such changes, if any, to be driven by the same

actions they focus on are those motivated by longer-term considerations instead of current or prospective economic conditions: reducing inherited budget deficits and ensuring long-term public financial stability. These consolidations might be motivated as well as to reduce inequality and/or to enhance economic efficiency. However, Romer and Romer (2010) and Devries et al. (2011) suggest that such fiscal consolidations are responses to past economic conditions or decisions that are unlikely to be systematically correlated with short-term developments and are valid for estimating short- to medium- term effects on economic activity.

Another concern is the possible anticipation from agents to the fiscal consolidation such that they change their behavior and distort the true timing of the shock. For example, if fiscal consolidation is anticipated, then income inequality is not likely to react to the announcement. To estimate whether anticipation effects are present within the five-year window suggested before, I ran a regression of the levels of each of the income inequality measures in subsequent fiscal consolidation announcements and past levels of income inequality. That is,

$$INEQ_{it} = \sum_{s=1}^{4} \beta_s FCONS_{i,t+s} + \sum_{m=1}^{4} \rho_m INEQ_{i,t-m} + \varepsilon_{i,t} \tag{1}$$

where $INEQ_{i,t}$ is either of the three measures of income inequality (BOT50, MID40, TOP1), and $FCONS_{i,t}$ is an expenditure consolidation or a tax consolidation. The $\varepsilon_{i,t}$ is the error term.

Table 2: Regression of Income Inequality Measure on Subsequent Fiscal Consolidations

	Expenditure Consolidation			Tax Consolidation		
Coefficients	BOT50	MID40	TOP1	BOT50	MID40	TOP1
β_1	-0.091	-0.114	0.140	-0.144	0.052	0.184
	(0.045)	(0.068)	(0.075)	(0.070)	(0.064)	(0.094)
β_2	-0.046	0.003	0.086	0.074	-0.066	0.004
	(0.098)	(0.093)	(0.110)	(0.043)	(0.108)	(0.088)
β_3	-0.054	0.100	-0.118	-0.146	-0.007	-0.010
	(0.092)	(0.105)	(0.110)	(0.102)	(0.090)	(0.139)
β_4	0.083	-0.071	-0.072	0.088	-0.085	-0.087
	(0.078)	(0.093)	(0.109)	(0.087)	(0.066)	(0.111)
Observations	469	469	469	469	469	469
R^2	.642	.638	.611	.644	.638	.611

Driscoll-Kray standard errors in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

The results of the estimation of (1) are presented in Table 2. The results in Table 2 suggest that there is no anticipation of fiscal actions for any of the measures of income inequality in the short

ruling party.

term. This is because none of the β_s coefficients is statistically significant. All the estimations of the standard errors are done using Driscoll-Kraay standard errors with two lags of autocorrelation that are heteroscedasiticity consistent and robust to cross-section and temporal dependence in panel data.

3 The effects of fiscal consolidations on income inequality

In this section, I present the main results of the analysis. I estimated such results using Jorda (2005) local projections. This is because the local projection framework is flexible enough to allow for a panel structure and does not limit the shape of the impulse response function. The benchmark specification is given by:

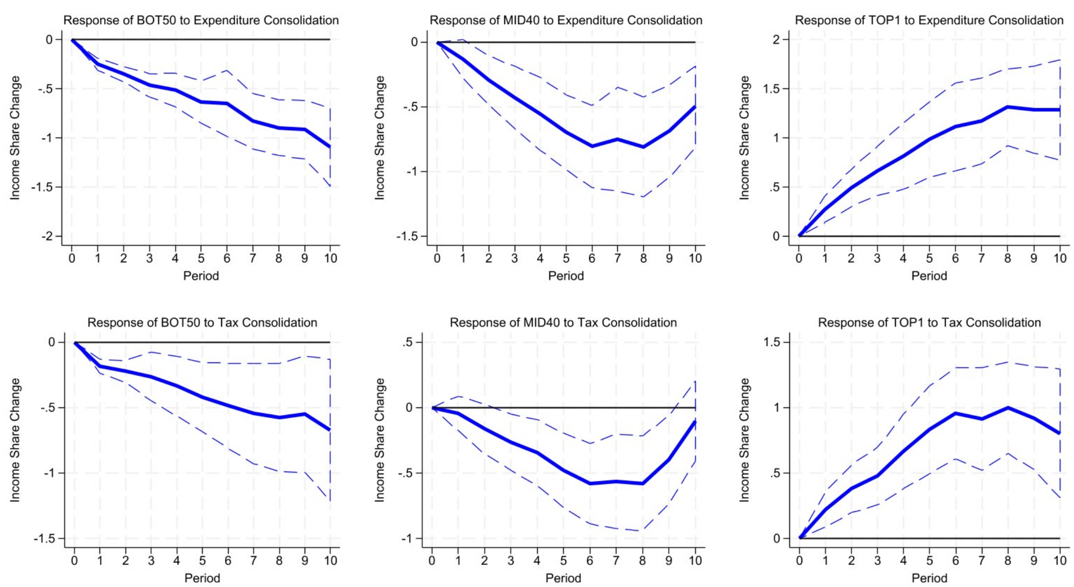
$$\Delta_{h,t} INEQ_i = \beta_h FCONS_{i,t} + \sum_{m=1}^{2} \alpha_m \Delta X_{i,t-s} + \varepsilon_{i,t+h} \tag{2}$$

where $\Delta_{h,t} INEQ_i \equiv INEQ_{i,t+h} - INEQ_{i,t-1}$, and $INEQ_{i,t}$ is one of the three measures of income inequality, $FCONS_{i,t}$ is the variable of the fiscal consolidation indicator that equals 1 if the country i had a fiscal consolidation in year t and 0 otherwise. The coefficient of interest is β_h, which would be the change in the level of $INEQ$ to an implementation of a fiscal consolidation in time $t-1$. The vector $X_{i,t}$ captures additional controlling variables such as real GDP growth and past growth of the $INEQ_{i,t}$ variable. The inclusion of this variable is to control for the economic activity as well as the behavior of income inequality of the country i in period t. The results are estimated for $h = 1, 2 \ldots, 10$ periods.

The results of the estimation of (2) in each of the three variables of income inequality (BOT50, MID40, TOP1) for each of the two of fiscal consolidation (Expenditure Consolidation and Tax Consolidation) are presented in Figure 3. The figure presents the cumulative change of income inequality in relation to the fiscal consolidation shock. The top panel presents the responses to an expenditure consolidation and the bottom panel presents those for the tax consolidation. The point estimate of the coefficient β_h is represented in the solid blue line, and the shaded area is the 90 percent confidence interval estimated from the Driscoll-Kraay standard errors. Note that the fiscal consolidations imply an increase in the gross primary budget for up to 6 periods (see Appendix C). This suggests that the effect of fiscal consolidations is not transitory, at least in the medium term; thus, one can expect that its impact on income inequality can continue in the medium and long term.

For expenditure consolidation (top panel), the results in Figure 3 suggest that there is a cumulative reduction in the share held by the bottom 50% over the horizon of up to almost 1.1 percentage points. This result suggests that, on average, the income share held by the bottom 50% drops from 16.3 to 15.2 at the end of the ten periods after the expenditure consolidation took place. For the income share held by the middle 40% there is a statistically significant reduction of more than 0.8 percentage points up to period 5 and then it does not change until the end of the observed period. This suggests that the income share of the middle 40% decreased from 41.6% to 40.8%. These two results suggest that the top 10% gained around 2 percentage points more in their income share. From that gain, around 1.4 was gained from the top 1% at the end of the horizon. All of these results suggest that an expenditure consolidation leads to an increase in income inequality across the sample.

Figure 3: Effects of Fiscal Consolidation on Income Inequality



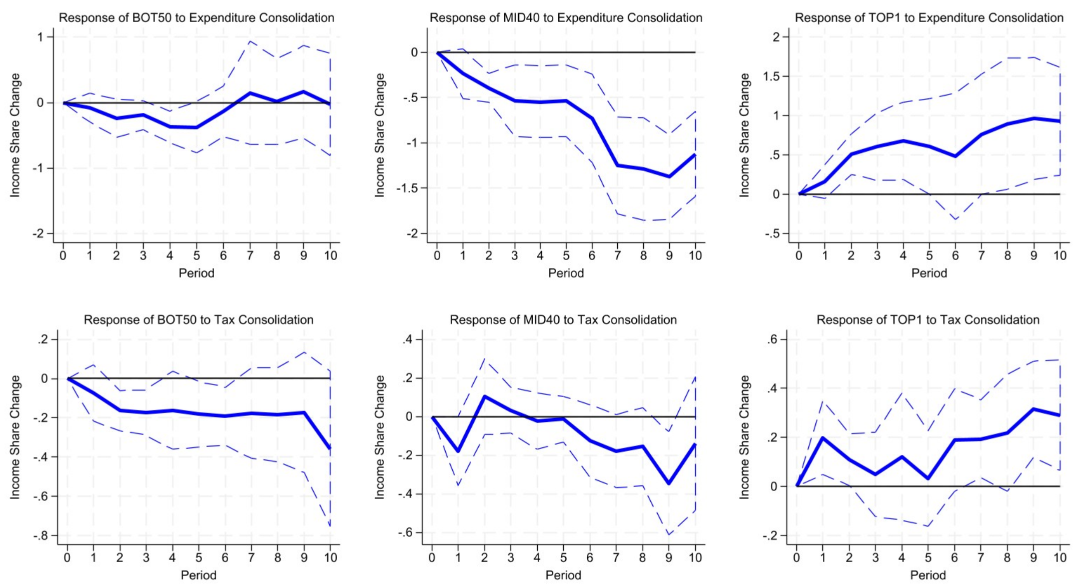
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

For tax consolidation (bottom panel), the results in Figure 3 suggest a picture similar to that of expenditure consolidation. The response of the income share held by the bottom 50% suggests that it is reduced by 0.6 percentage points at the end of the time horizon. The middle 40% drops around 0.6 percentage points in period 5 and slowly reduces its impact towards the end of the period. Unlike the case for the expenditure consolidation, it drops constantly across the time horizon. The top 1%

had an increase of 1 percentage point in the income share at the end of the horizon. All of these results suggest that an expenditure consolidation leads to an increase in income inequality across the sample.

In a second set of results, I estimate (2) with the size of the fiscal consolidation instead of the indicator variable. The fiscal consolidation on this estimate is demeaned. The interpretation of the coefficient β_h is the change in $INEQ$ for a unit increase in the size of the fiscal consolidation, which is measured as a share of GDP. The results are presented in Figure 4. Recall that the fiscal consolidation variable in this set of results is measured as a share of GDP. Thus, the shock is a 1 percentage point increase in the budgetary impact of fiscal consolidation.

Figure 4: Effects of Fiscal Consolidation Size on Income Inequality



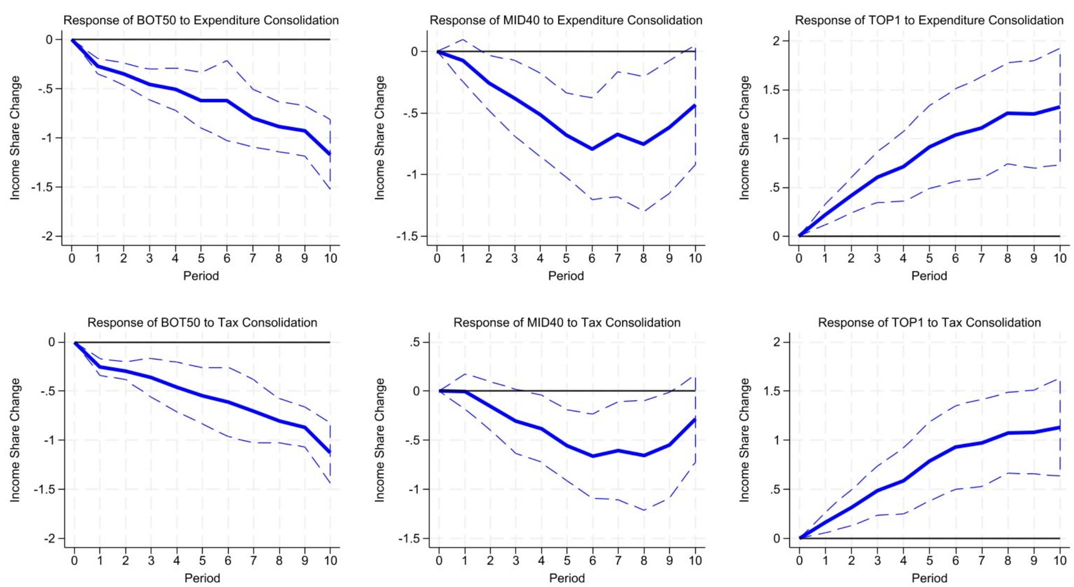
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

The top panel of Figure 4 presents the results for the size of expenditure consolidation. These results suggest that there is no statistically significant impact on the income share held by the bottom 50% and the top 1%. There is a statistically significant drop in the middle 40% share of 1.2 percentage points. There are no statistically significant results for the bottom 50% and the middle 40%, while there is a small gain of 0.2 percentage points for the top 1% for the tax consolidation towards the end of the time horizon.

In conclusion, fiscal consolidation leads to a significant increase in income inequality. The effect is slightly bigger for the expenditure consolidation than that of tax consolidation, which makes sense since the government spending could mean a reduction in social programs targeted to low income groups, while tax consolidation usually means a change in disposable income. In this sense, it is the top 1% group that has benefited the most from either of the fiscal consolidation. However, it seems that the impact is driven more by the fiscal consolidation announcements (that is, the indicator variable) than by the budgetary impact of such consolidations.

A third set of results aims to look into the heterogeneous effect between country-type samples. To this effect, I estimate the same set of regressions for each AEs and EMEs group of countries. Figures 5 and 6 present the results of estimating (2) for the sample of advanced economies and emerging economies, respectively.

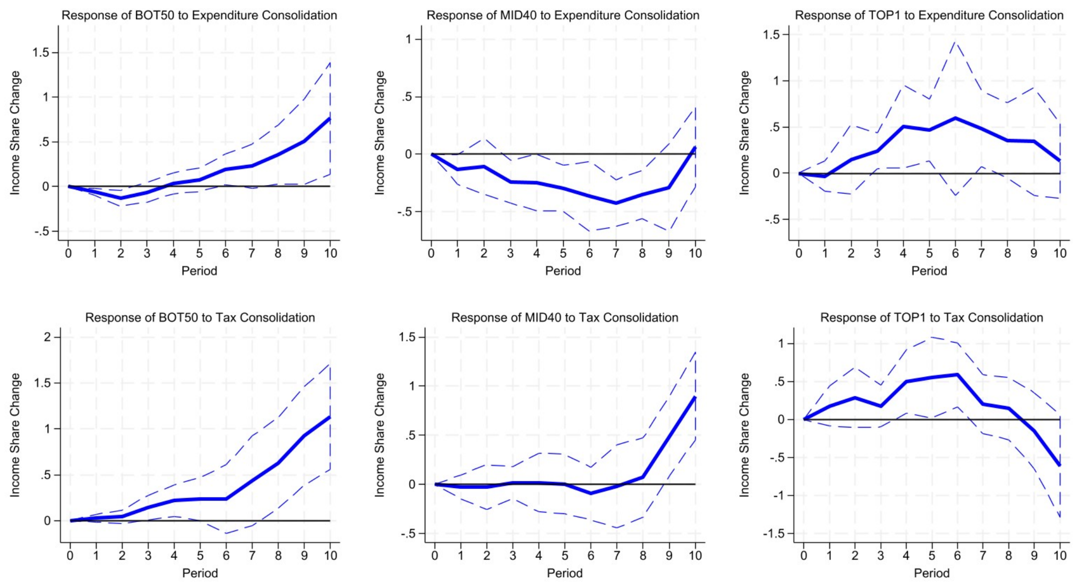
Figure 5: Effects of Fiscal Consolidation on Income Inequality in Advanced Economies



Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

For the sample of advanced countries, Figure 5 suggests that there is a reduction in the income share held by the bottom 50% up to almost 1.2 percentage points over the time horizon for both expenditure consolidation and tax consolidation. For the middle 40% of the income distribution, there is a statistically significant effect of expenditure consolidation (up to 0.8 percentage point) and tax consolidation (up to 0.8 percentage points). Finally, the main winners of fiscal consolidation measures are the top 1% of the income distribution, where they see an increase of up to 1.6 percentage points for both expenditure consolidation and tax consolidation.

Figure 6: Effects of Fiscal Consolidation on Income Inequality in Emerging Economies



Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 6 presents the results for the emerging economies. In terms of expenditure consolidation, there is no statistically significant effect for the bottom 50%, the middle 40% and the top 1%. In contrast, tax consolidation appears to increase the income share held by the bottom 50% up to a percentage point at the end of the studied period (up to 1 percentage point). A similar pattern can be seen for the middle 40%. Conversely, the top 1% has no statistically significant effect on its income share.

The analysis reveals that fiscal consolidation typically increases income inequality. Both expenditure and tax consolidation decrease the income share of the bottom 50% and middle 40%, while the top 1% sees gains, with expenditure consolidations having a more pronounced effect. The size of fiscal consolidations relative to GDP results in less significant and only temporary impacts on the middle-income group. Advanced economies experience larger increases in inequality compared to emerging economies after fiscal consolidation. In general, fiscal consolidation, especially through spending cuts, contributes to the widening of income inequality. The results are robust to the measure of income inequality. In the Appendix D, I repeated the analysis using the Gini coefficient with similar qualitative results.

4 Transmission Channels of Fiscal Consolidation on Income Inequality: credit constraints and capital accumulation

This section presents two types of transmission channels through which fiscal consolidations have an effect on income inequality. The two main channels studied here are credit constraints and capital accumulation. To do so, I modify (2) by introducing the relevant channel ($CH_{i,t}$) as an additional regressor and interact it with the fiscal consolidation indicator. I use the lag variable to avoid possible endogeneity. That is,

$$\Delta_{h,t}INEQ_i \;=\; \hat{\beta}_h FCONS_{i,t} + \alpha_h CH_{i,t-1} + \gamma_h FCONS_{i.t} \times CH_{i,t-1} + \sum_{m=1}^{2} \delta \Delta X_{i,t-m} + \varepsilon_{i,t+h} \quad (3)$$

where $CH_{i,t}$ can be either of the following variables: a) for the credit constraint channel, credit to the private sector and liquid liabilities, both as shares of GDP, b) for the capital accumulation channel, real capital stock, internal rate of return and human capital. The vector $X_{i,t}$ contains the real GDP per capita and the corresponding $INEQ_{i,t}$. One can expect that $\hat{\beta}_h$ captures the fiscal consolidation effect net of the effect of the channel, holding all else constant. Thus, the channel effect of the impact of a fiscal consolidation can be captured by the difference between the coefficient $\hat{\beta}_h$ from (3) and the coefficient β_h from (2). Note that this is also the cumulative effect over the time horizon h. The interpretation is the total change in the income share of the fiscal consolidation.

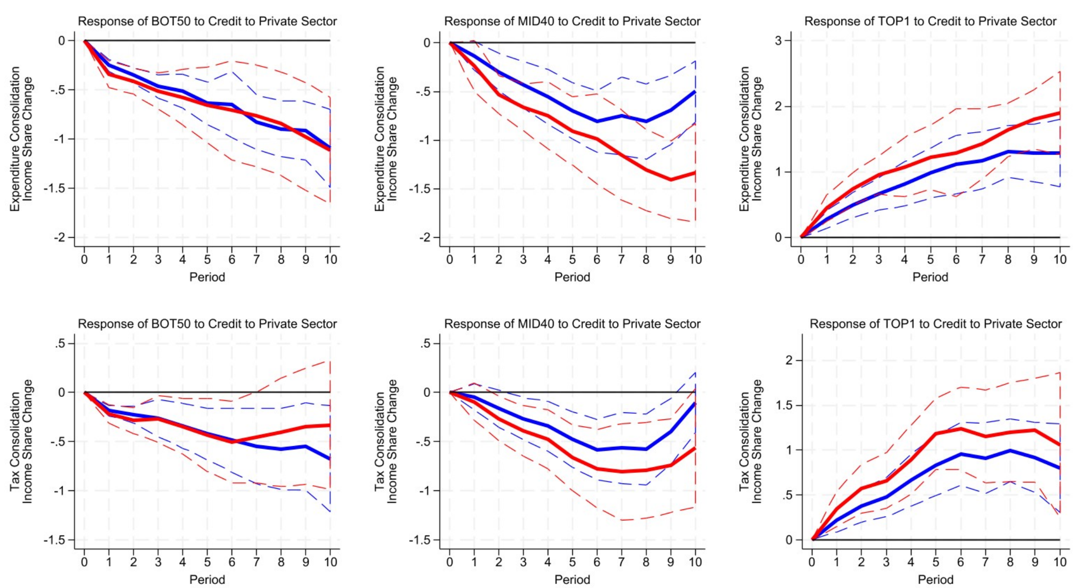
The results of the estimation of (3) are presented in the following figures in this section. In each of the figures, the blue line represents the estimated β_h from (2) and the red line represents the $\hat{\beta}_h$ from (3), and the corresponding confidence intervals at 90% are represented by the dashed lines in their respective colors.

4.1 Credit Constraint Channel

As suggested by Galor and Moav (2004), Galor and Zeira (1993), Perotti (1996), an important channel for the transmission of fiscal policy is the credit constraint. The rationale behind this channel is straightforward. A binding credit constraint deters private agents from accessing productive investments. These productive investments could lead to significant income gains for these agents. Fiscal consolidation, which could lead to a loss of disposable income, accompanied by a tightening of credit access, could potentially lead to an increase in income inequality. On the other hand, increased access to credit could potentially increase income inequality since credit is not necessarily used by lower income households due to lack of collateral (Beck et al., 2007).

Figure 7 presents the results for credit to the private sector as a proxy for credit constraints. The point estimate of the parameter $\hat{\beta}_h$ in red suggests that the credit to the private sector lowers the income share for both the bottom 50% and the middle 40% and increases the share for the top 1% in a larger magnitude than that of the benchmark case (blue line). However, the confidence bands overlap between the estimations. However, the evidence seems to point to that the credit constraint channel amplifies the fiscal consolidation effect on income inequality. This suggests that lower income households are not using increased credit access to invest in income-generating activities.

Figure 7: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality

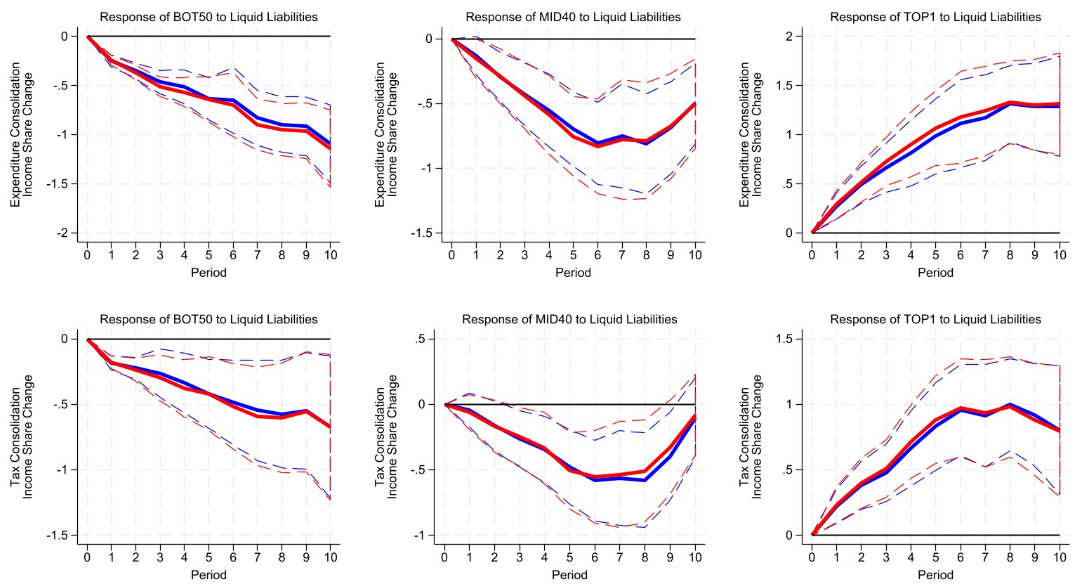


Note: The blue and red solid line is the β_h and $\hat{\beta}_h$ from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

The results for the same credit constraint by type of economy are presented in Figures 22 and 23 in the Appendix F. They follow the same pattern as discussed for the aggregate result.

The second measure for the credit constraint channel is liquid liabilities as share of GDP. This variable captures the size of the financial intermediaries in the economy. Thus, an increase in size implies that the credit constraint becomes less binding. This differs from the previous measure, since this covers not only domestic credit to the private sector, but also the role of the central bank and other financial institutions.

Figure 8: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality



Note: The blue and red solid line is the β_h and $\hat{\beta}_h$ from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

The evidence in Figure 8 suggests that there is no difference between the benchmark results and this variable in the credit constraint channel. The results in Figures 24 and 25 in the Appendix F present a similar picture of no difference between the benchmark results and the estimation of (3).

This evidence suggests that it is not the size of the entire financial system that matters for income inequality (measured in liquid liabilities), but it is the access for private agents to credit that matters. Further research on the recipients of this credit goes beyond the scope of this study but is a possible area of research in the future. I estimate (3) using the Gini coefficient with similar qualitative results. The results are in the Appendices G and H.

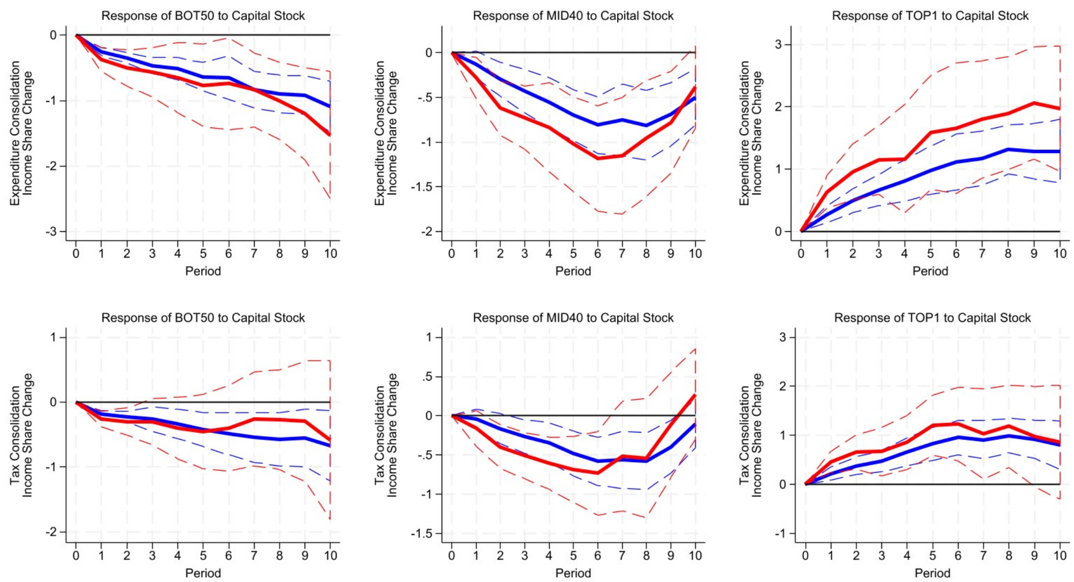
4.2 Capital Accumulation Channel

There are fiscal policy effects that can affect factor accumulation. They can occur indirectly through incentives for private accumulation or directly through public investment (King and Rebelo, 1990, Lucas, 1988, Mendoza et al., 1997, Rebelo, 1991, Stokey and Rebelo, 1995). The former is closely related to the savings rate such that this rate increases with the income level of households (Bourguignon, 1981, Gründler and Scheuermeyer, 2018, Kaldor, 1955). The latter can generate crowding out of productive private and public investment that affects long-term growth (Barro, 1990, Devarajan et al., 1996, Milesi-Ferretti and Roubini, 1998). Finally, Galor and Moav (2004) suggests that an increase in aggregate savings and physical capital investment can support an increase in income inequality, while human capital accumulation could drive a reduction in income inequality.

Figure 9 presents the estimation of (3) with real capital stock as a channel. In terms of expenditure consolidation, it can be seen that the point estimate of $\hat{\beta}_h$ (red line) differs from that of the benchmark case (blue line) for the middle 40% and the top 1%. For example, it suggests that a fiscal consolidation of this type reduces in a greater proportion the income share for the middle 40% and increases it for the top 1% towards the end of the time horizon. This pattern is similar for tax consolidation, even suggesting that the middle 40% has a positive increase in their income share 9 years after the consolidation. Furthermore, this pattern is replicated in Advanced Economies as seen in Figure 26 in Appendix F. It is worth noting that for and expenditure consolidation and a tax consolidation for the Emerging Economies have a significant impact on income inequality reduction. The results are presented in Figure 27 in Appendix F. For example, for the bottom 50% and the middle 40% their income shares increase by 1 (1.5) and 0.4 (1.5) percentage points at the end of the time horizon, while the top 1% reduces its income share by 0.1 (1.2) percentage points for a expenditure consolidation (tax consolidation).

Figure 10 presents the results of the estimate $\hat{\beta}_h$ of 3 with human capital as a channel. For both an expenditure consolidation and a tax consolidation, there is no significant difference with the benchmark results for each of the income share groups. The Advanced Economies follow a similar pattern on this channel. However, statistically significant differences can be observed between the point estimates in the Emerging Economies sub-sample. For example, for expenditure consolidation, there is a significant increase in the income share for the bottom 50% towards the end of the period of 1.2, while there is positive but not statistically significant increase 0.5 percentage points for the

Figure 9: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality



Note: The blue and red solid line is the β_h and $\hat{\beta}_h$ from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

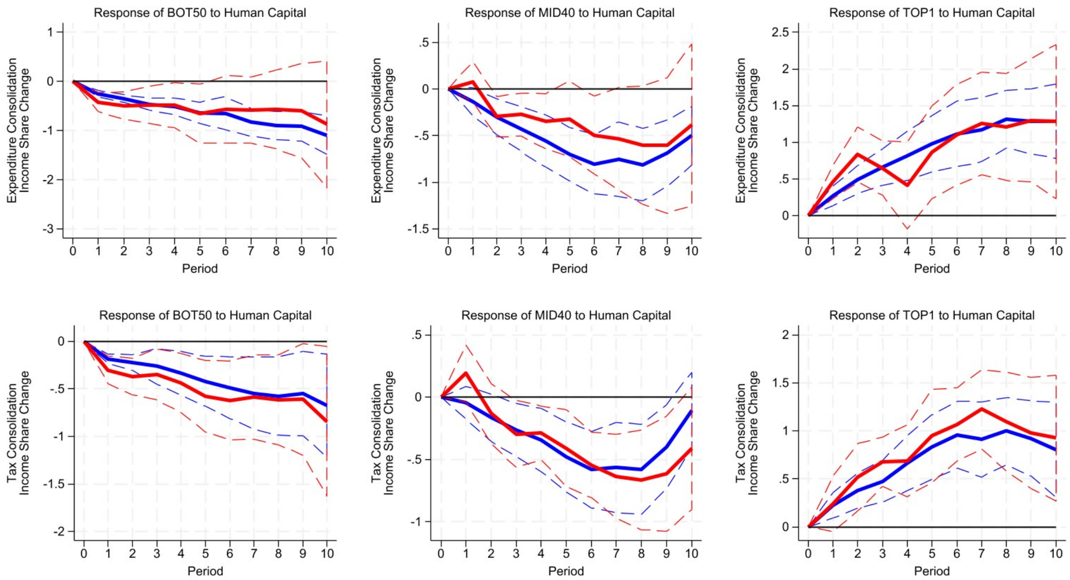
middle 40%. For the top 1%, there is no statistically significant effect. For tax consolidation, one can observe that the bottom 50% and the middle 40% have a statistically significant increase in their income shares throughout the time horizon while the top 1% has a decrease in its income share.

The above results suggest that the capital accumulation channel matters for the reduction of income inequality. It seems to be more relevant in Emerging Economies than in Advanced Economies, and it is more relevant in tax consolidations than in expenditure consolidations. I estimate (3) using the Gini coefficient with similar qualitative results. The results are in the Appendices G and H.

5 Conclusion

In conclusion, this paper has investigated the dynamic responses of income inequality to fiscal consolidations, with a focus on both advanced and emerging economies. The analysis indicates that fiscal consolidations, whether through expenditure reductions or tax increases, tend to increase income inequality by reallocating income shares from the bottom and middle segments of the income distribution to the upper portions. The impacts are especially pronounced in advanced economies,

Figure 10: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality



Note: The blue and red solid line is the β_h and $\hat{\beta}_h$ from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

where fiscal consolidations result in substantial reductions in the income shares of the bottom 50% and the middle 40%, while the top 1% experiences income gains. In emerging economies, the results are more heterogeneous, with fiscal consolidations sometimes resulting in minor improvements in the income share of the bottom 50%, although these effects are generally fleeting and less significant than the gains observed by the top income group.

The analysis suggests that the credit constraint channel can be a transmission channel through which fiscal consolidations affect income inequality. As mentioned above, credit access could play a dual role during fiscal consolidations. On the one hand, it can smooth disposable income for households and allow new productive investments to take place, potentially leading to reduction of income inequality. However, it could lead to an increase in income inequality, as credit is usually not accessible to lower-income households due to the lack of collateral. This last role seems to be taking place in the sample of countries studied here. Income inequality seems to be increasing after fiscal consolidation, and this effect occurs for Advanced Economies and Emerging Economies alike.

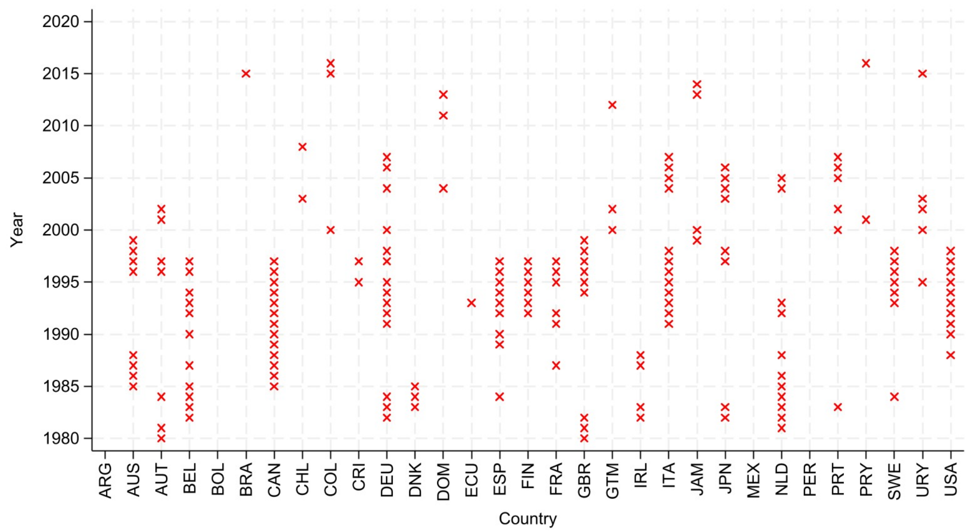
The capital accumulation channel also plays a substantial role in the transmission of fiscal consolidations to income inequality. As suggested by the literature, the accumulation of physical and human capital leads to a reduction of income inequality, especially for Emerging Economies and for tax consolidations. Without knowing the target of tax consolidation or its progressivity, it is not possible to determine how the design of the fiscal policy itself affects income inequality. This opens an area for further research especially for Emerging Economies.

Together, the findings of this article emphasize the intricate relationship between fiscal consolidations and income inequality. Both the credit constraint and capital accumulation channels illustrate how fiscal consolidation can amplify or diminish existing disparities in income distribution. Although the effects are more pronounced in advanced economies, emerging economies are not immune to the inequality-enlarging consequences of these policies. This analysis contributes to the growing body of literature that underscores the importance of considering the distributional impacts of fiscal consolidations, as they have the potential to reinforce income inequality, particularly through the mechanisms of credit access and capital accumulation.

Appendix

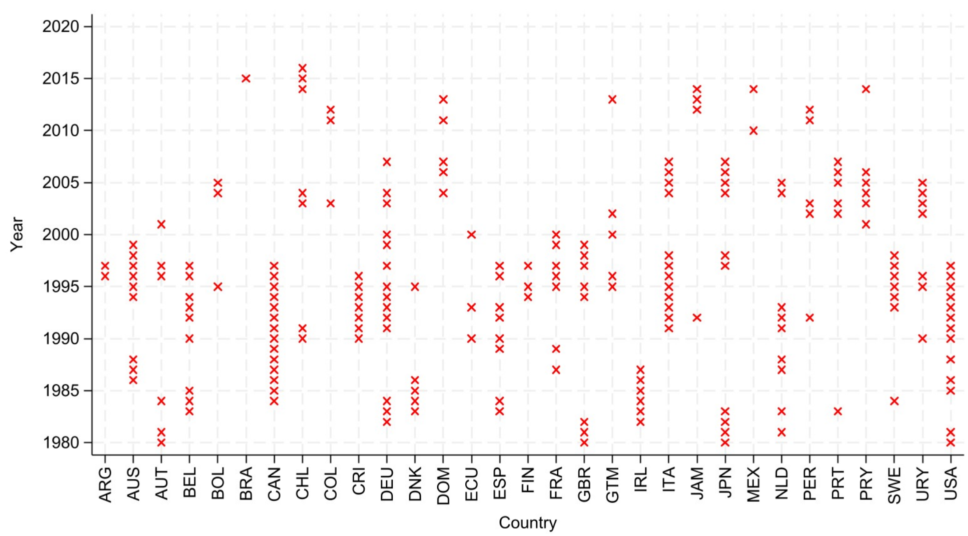
A Fiscal Consolidations by Country over Time Frame

Figure 11: Expenditure Consolidations by Country



Carrière-Swallow et al. (2021), Devries et al. (2011)

Figure 12: Tax Consolidations by Country



Carrière-Swallow et al. (2021), Devries et al. (2011)

B Unit Root Tests for Stationarity

I test for possible unit roots, which would suggest that the data are not stationary. To do so, I performed the Im et al. (2003) test for unit roots in heterogeneous panels. The results are presented in Table 3. The null hypothesis is that all panels contain a unit root. The first and second columns for each variable represent the relevant statistic and its p-value, respectively. Each row represents four different tests: i) without trend or demeaning the variables, ii) with just the trend, iii) with just demeaning, and iv) with both trend and demean. Note that for the credit to the private sector one cannot compute the p-value due to the presence of missing values that can lead to inconsistent estimation.[6]

From the results in Table 3, note that for most variables one can reject the null hypothesis of unit roots when including a trend for the variables of income inequality, while for real GDP, real capital stock, human capital, and liquid liabilities one cannot reject the null. On the other hand, one cannot reject the null hypothesis when the variables are demeaned. Finally, when including both (a trend and demeaning), one can reject the null hypothesis for all variables, except for liquid liabilities.

[6] The estimation needs that the panel has a size $T > 5$.

Table 3: Unit root test for Selected variables

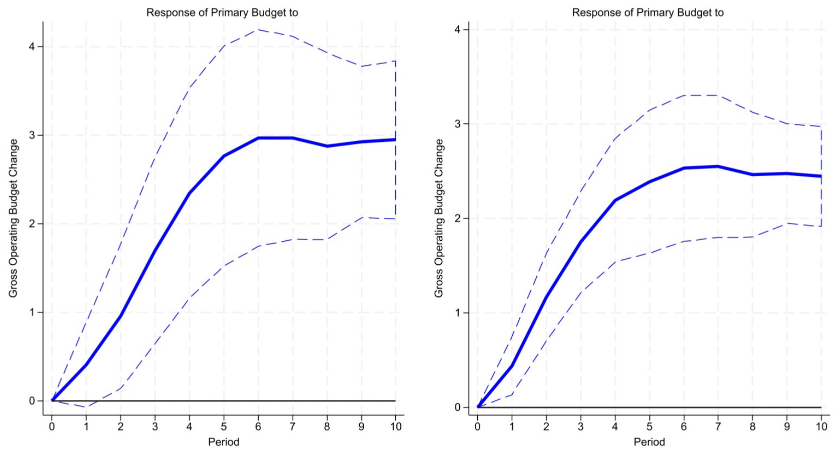
	$Z_{\tilde{t}-bar}$	p-value	$Z_{\tilde{t}-bar}$	p-value	$Z_{\tilde{t}-bar}$	p-value
	BOT50		MID40		TOP1	
None	0.32	0.62	-1.81	0.03	-1.03	0.15
Trend	-4.38	0.00	-5.44	0.00	-3.74	0.00
Demean	2.21	0.99	2.35	0.99	2.59	1.00
Both	-4.38	0.00	-4.14	0.00	-3.26	0.00
	GDP		Credit[a]		Liquid Liabilities	
None	15.19	1.00	8.25	-	6.70	1.00
Trend	-1.23	0.11	-2.31	-	-0.26	0.40
Demean	2.67	1.00	4.92	-	4.03	1.00
Both	-2.84	0.00	-0.56	-	-0.92	0.18
	Capital Stock		Human Capital			
None	23.10	1.00	3.12	1.00		
Trend	5.09	1.00	7.22	1.00		
Demean	3.57	1.00	4.11	1.00		
Both	-2.56	0.01	-3.16	0.00		

Im et al. (2003) unit root test. Null: all series contain a unit root.
a. P-values missing due to missing observations from variables.

C Behavior of the Primary Budget after a Fiscal Consolidation

I estimate (2) but I changed the dependent variable to the Gross Operating Budget for the central government including social security funds as percent of GDP from the IMF. The idea is to look how does the primary budget behaves after fiscal consolidation. The results are presented in Figure 13.

Figure 13: Effects of Fiscal Consolidation on Gross Operating Budget



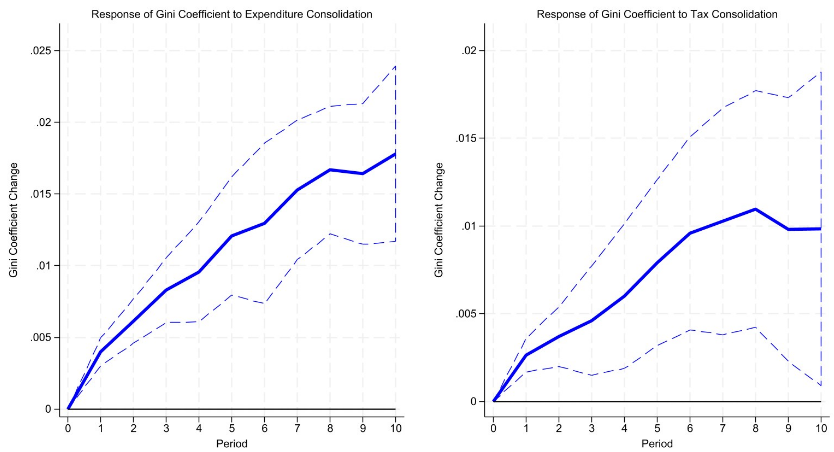
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

The results suggests that the primary budget increases around 3 percentage points in both types of fiscal consolidation after 6 periods from the fiscal consolidations and it starts to decrease towards the end of the time horizon.

D Results using the Gini Coefficient

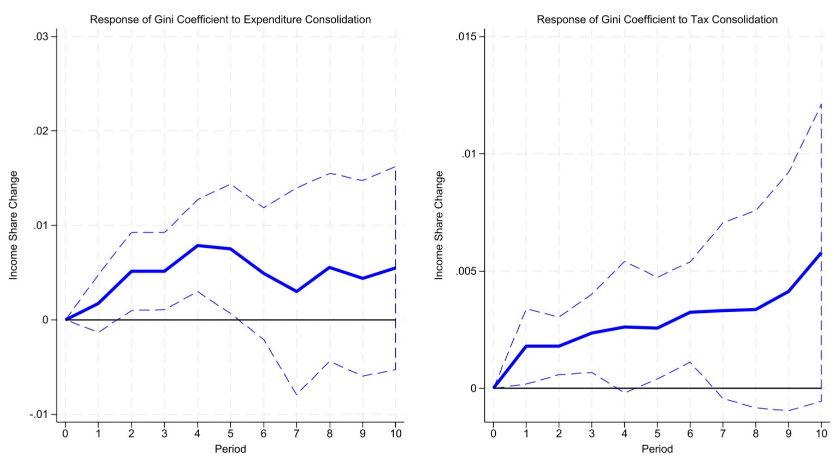
In this Appendix, the results of estimating (2) with the Gini coefficient for the three exercises in the main text.

Figure 14: Effects of Fiscal Consolidation on Income Inequality



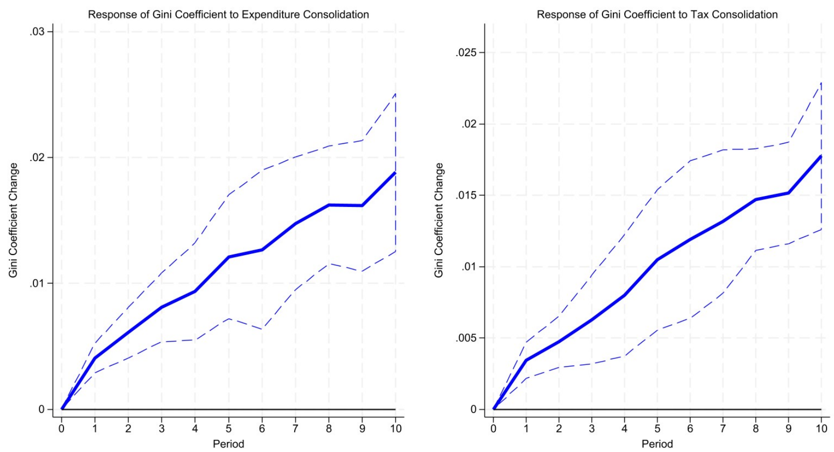
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 15: Effects of Fiscal Consolidation Size on Income Inequality



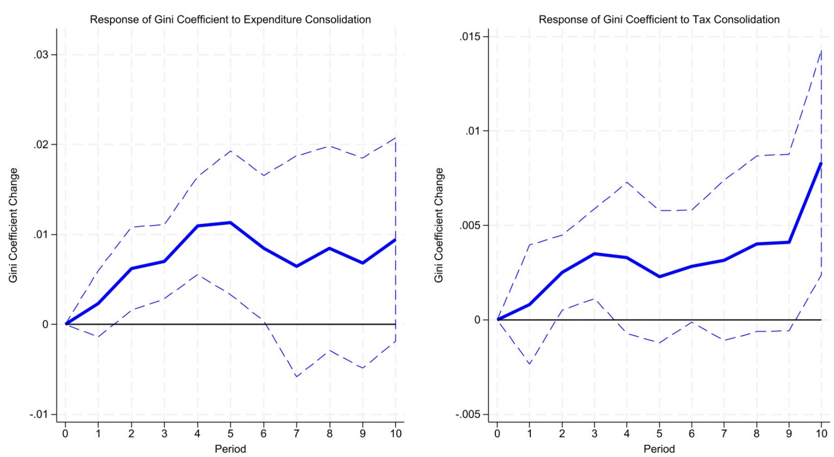
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 16: Effects of Fiscal Consolidation on Income Inequality in Advanced Economies



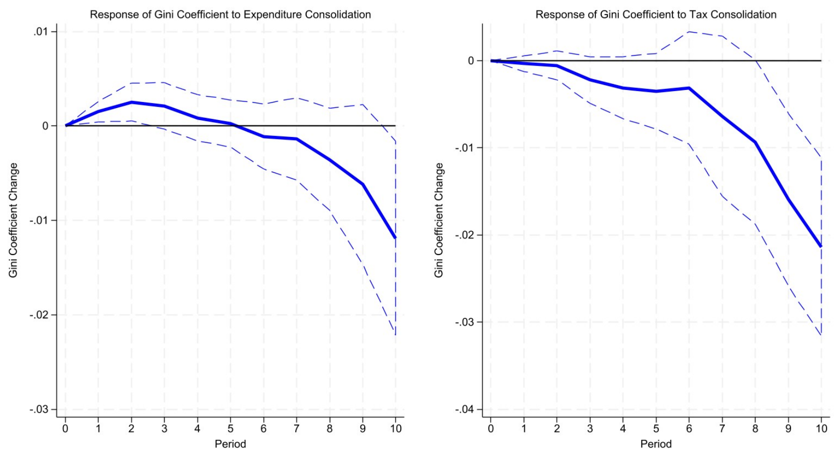
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 17: Effects of Fiscal Consolidation Size on Income Inequality in Advanced Economies



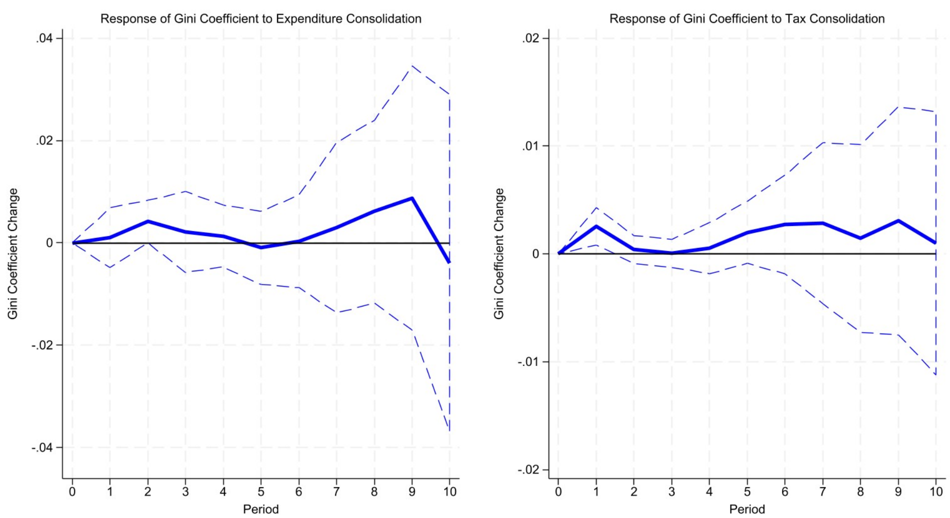
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 18: Effects of Fiscal Consolidation on Income Inequality in Emerging Economies



Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 19: Effects of Fiscal Consolidation Size on Income Inequality in Emerging Economies

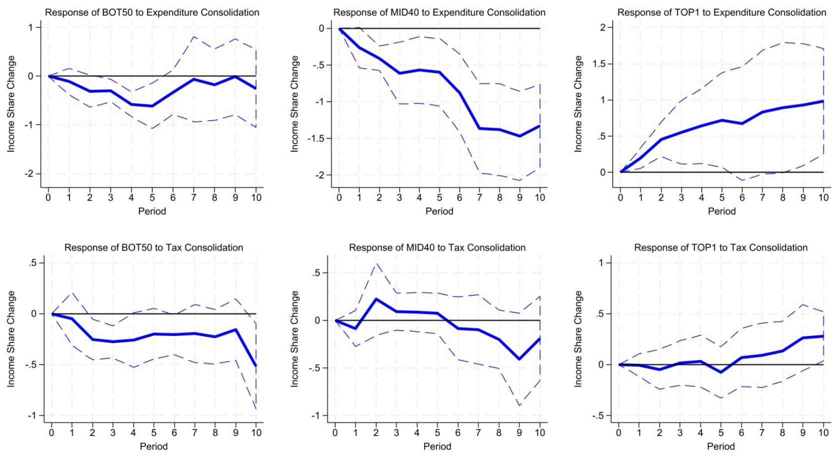


Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

E Additional Results Benchmark Results

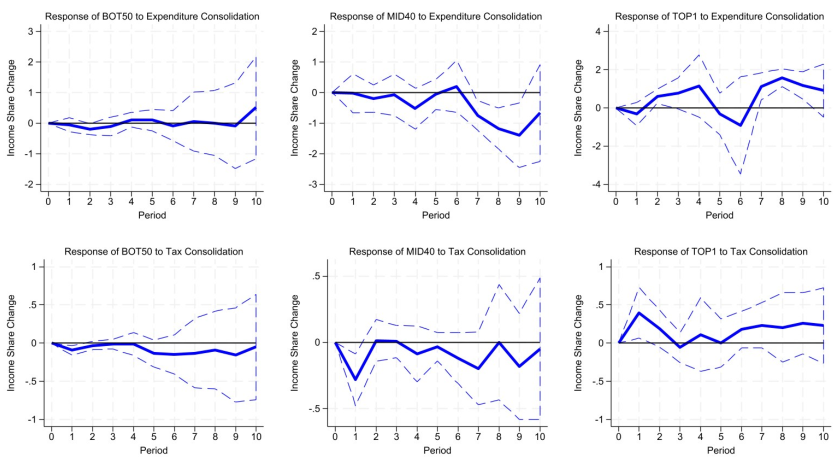
Furthermore, Figures 20 and 21 replicate the regression in which the fiscal consolidation variable is the budgetary impact for AEs and EMEs, respectively.

Figure 20: Effects of Fiscal Consolidation Size on Income Inequality in Advanced Economies



Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

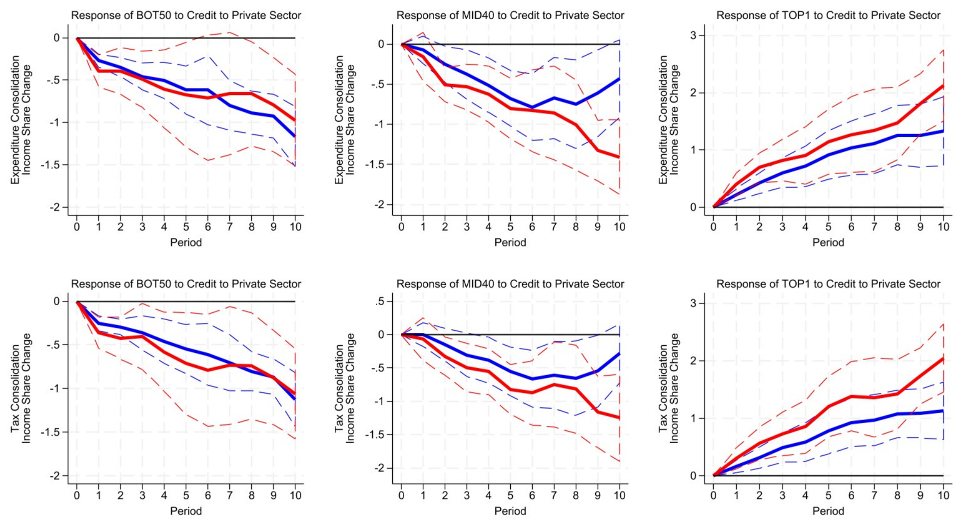
Figure 21: Effects of Fiscal Consolidation Size on Income Inequality in Emerging Economies



Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

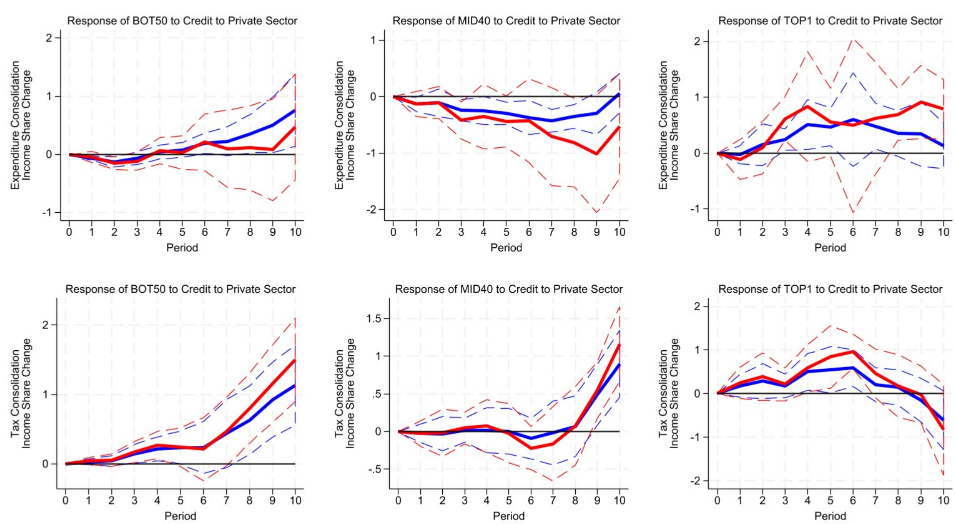
F Channel Results by Type of Economy

Figure 22: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



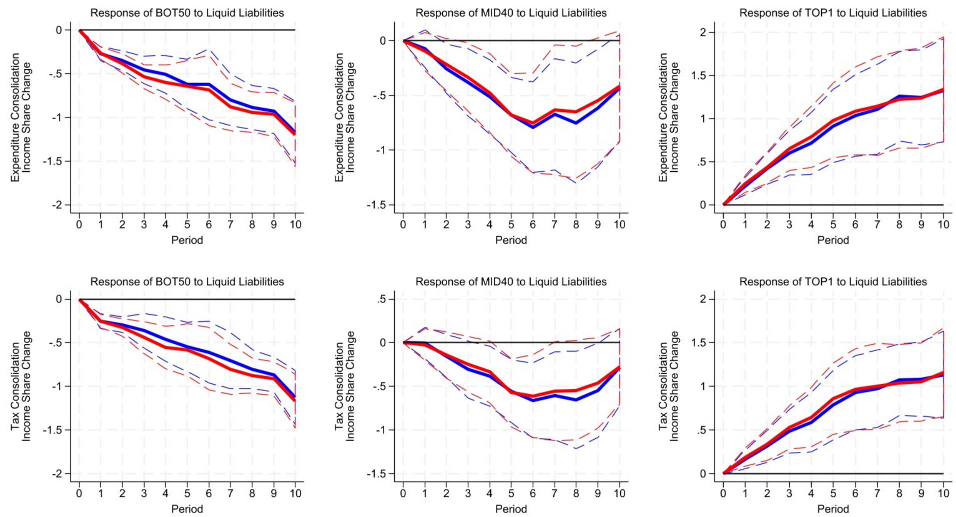
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 23: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



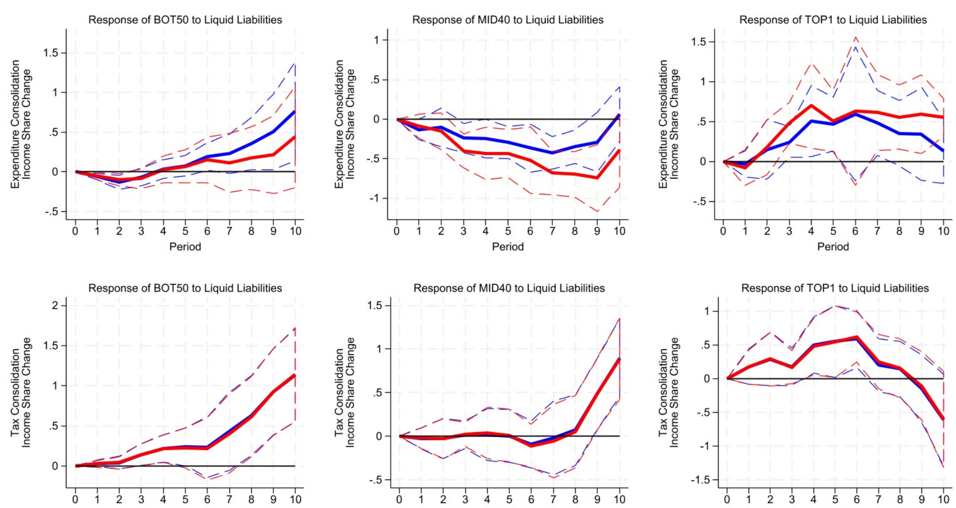
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 24: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



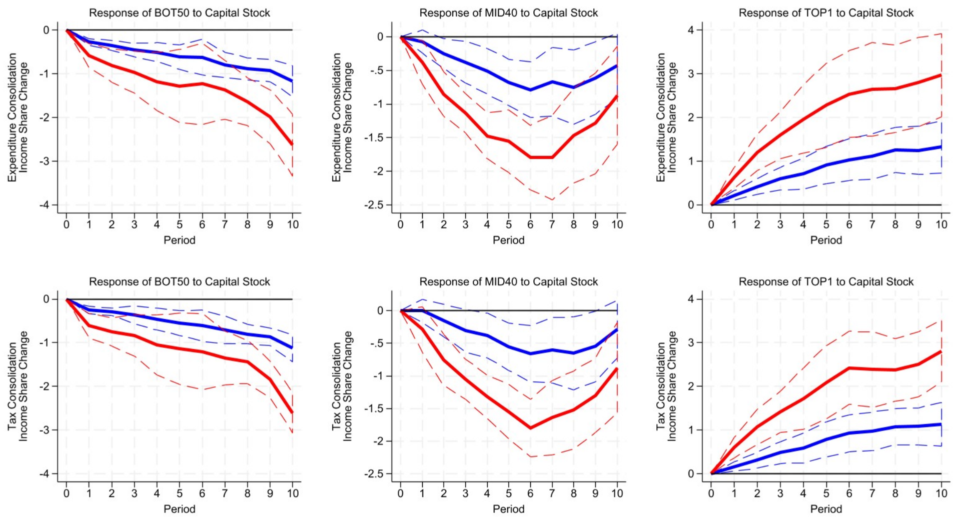
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 25: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



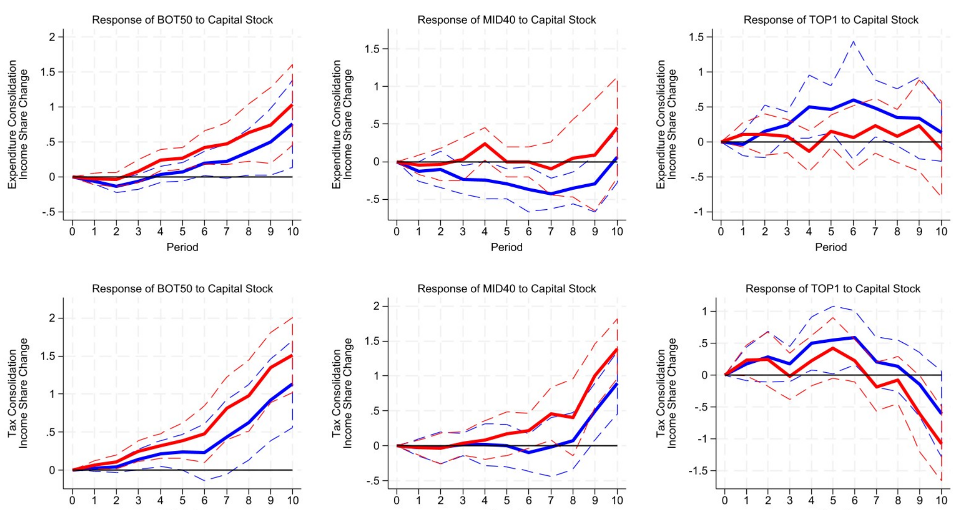
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 26: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



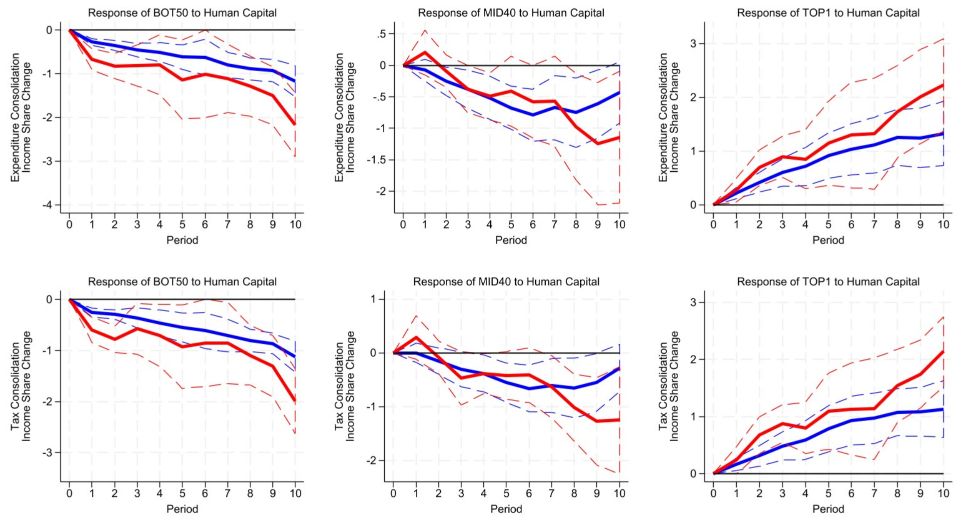
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 27: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



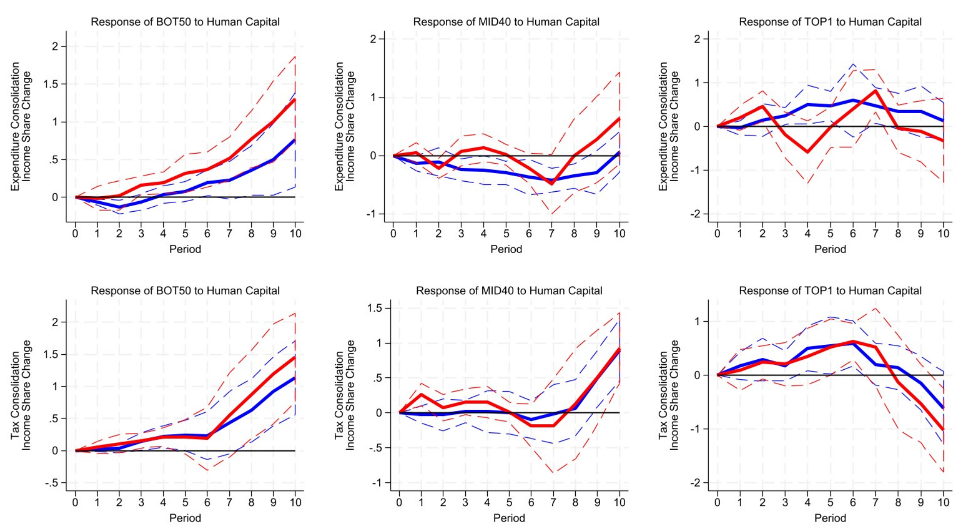
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 28: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

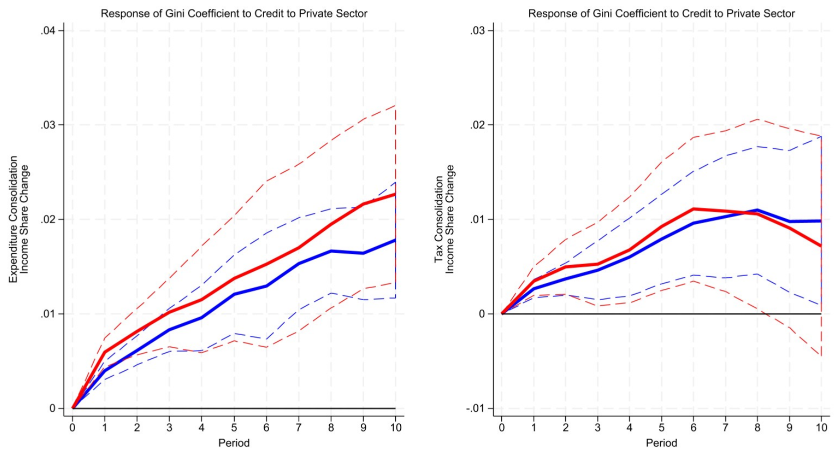
Figure 29: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

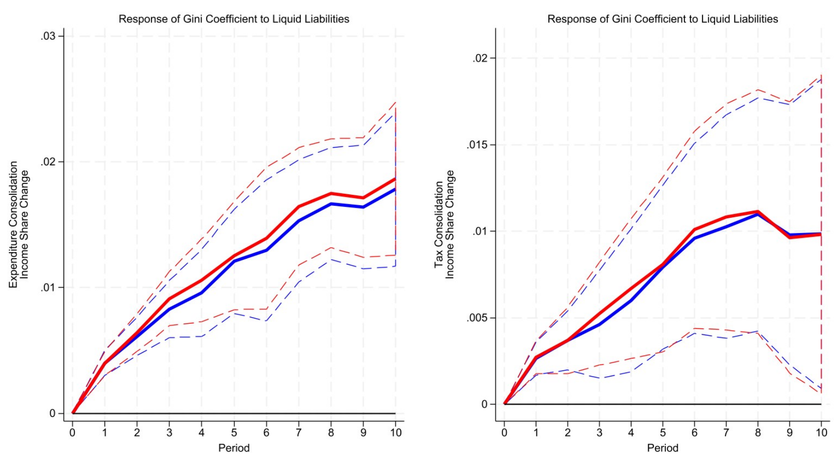
G Channel Results using Gini Coefficient

Figure 30: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality



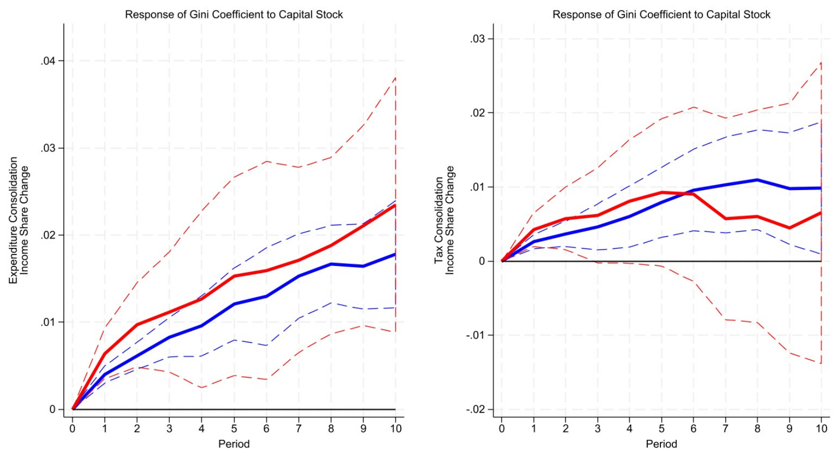
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 31: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality



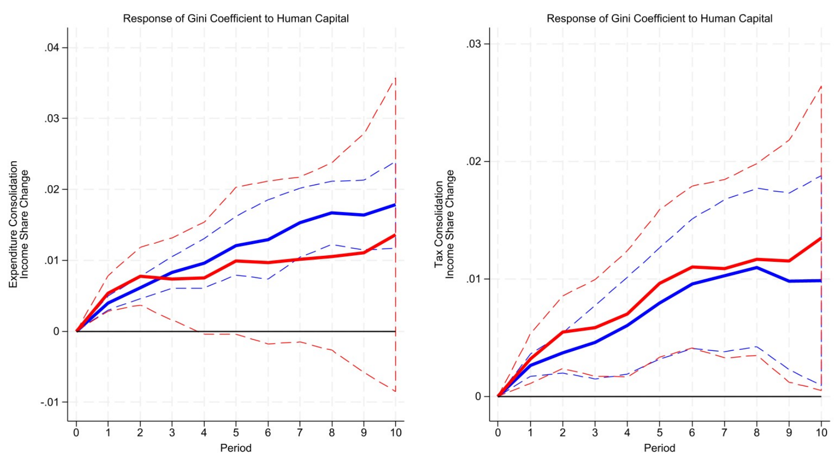
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 32: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

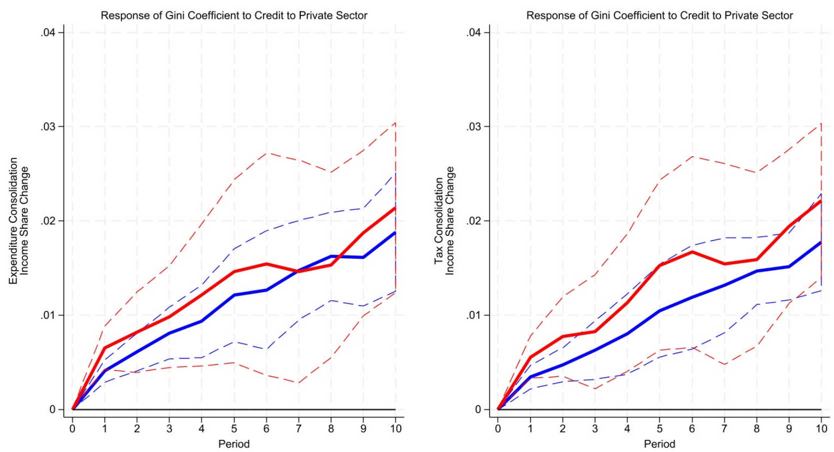
Figure 33: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

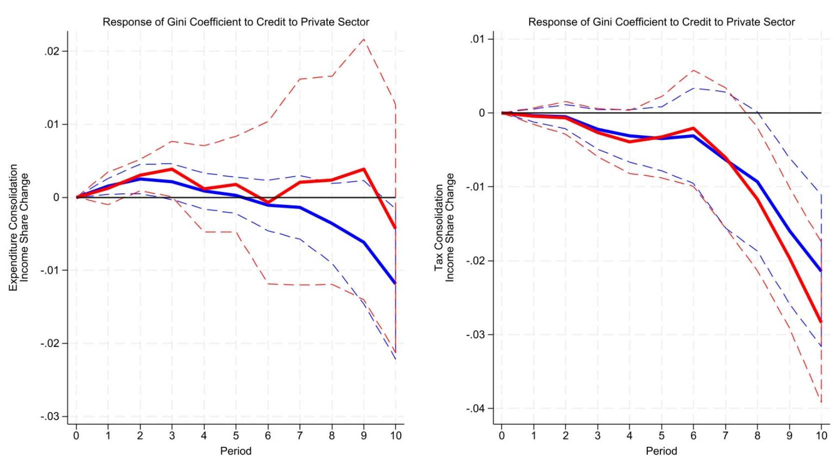
H Channel Results by Type of Economy using Gini Coefficient

Figure 34: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



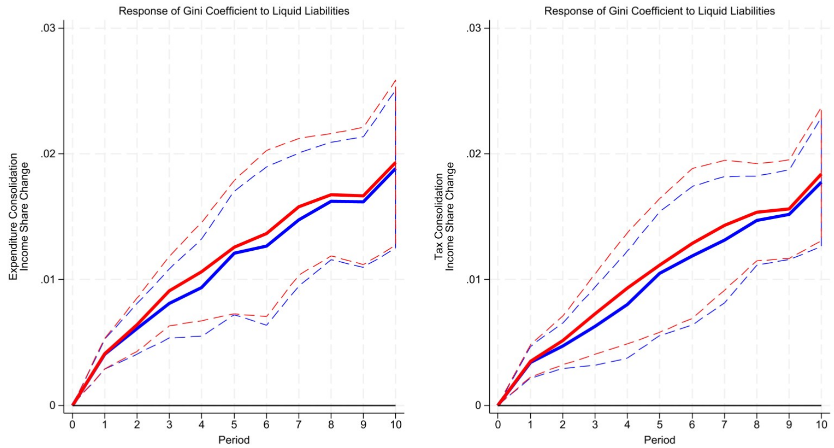
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 35: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



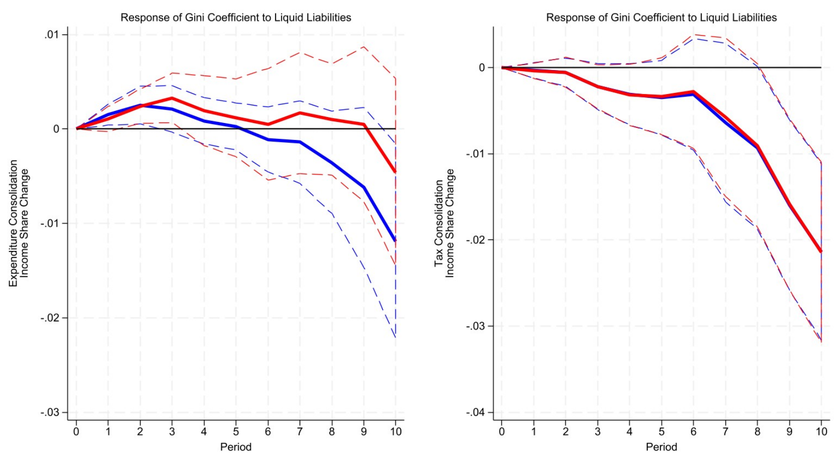
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 36: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



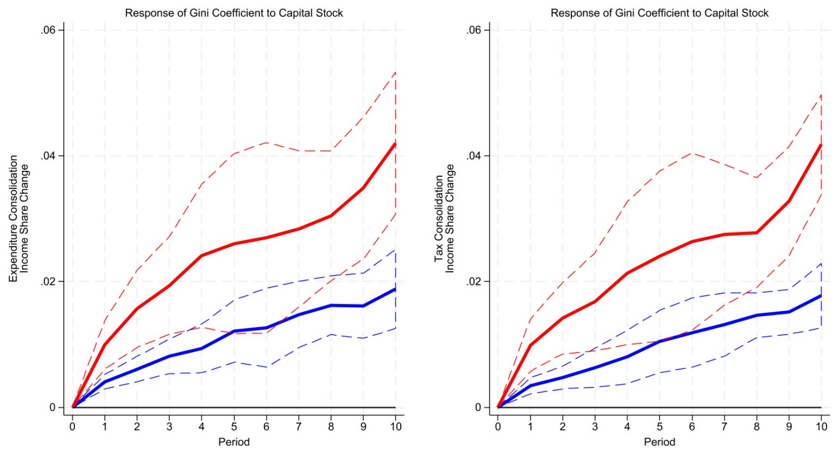
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 37: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



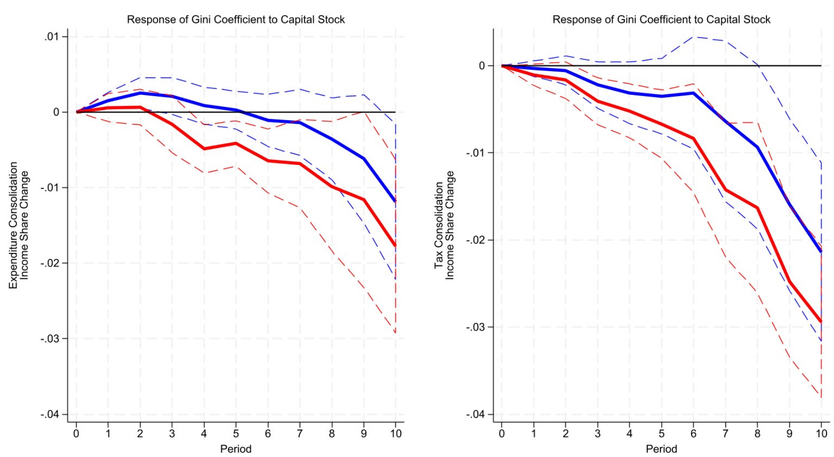
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 38: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



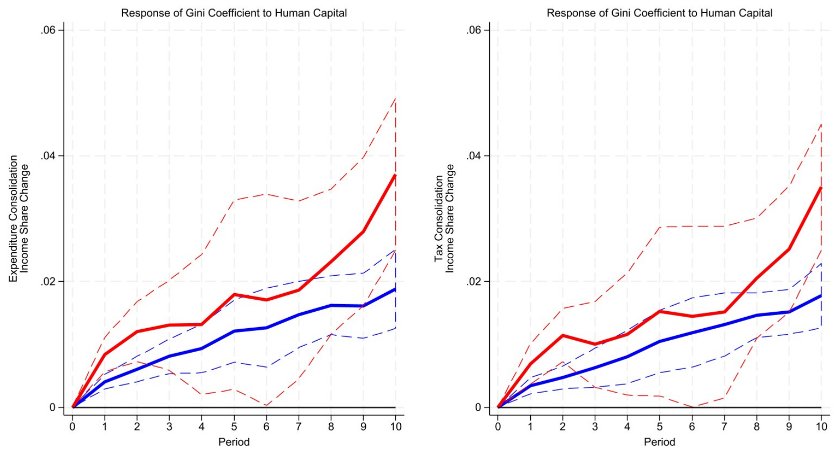
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 39: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



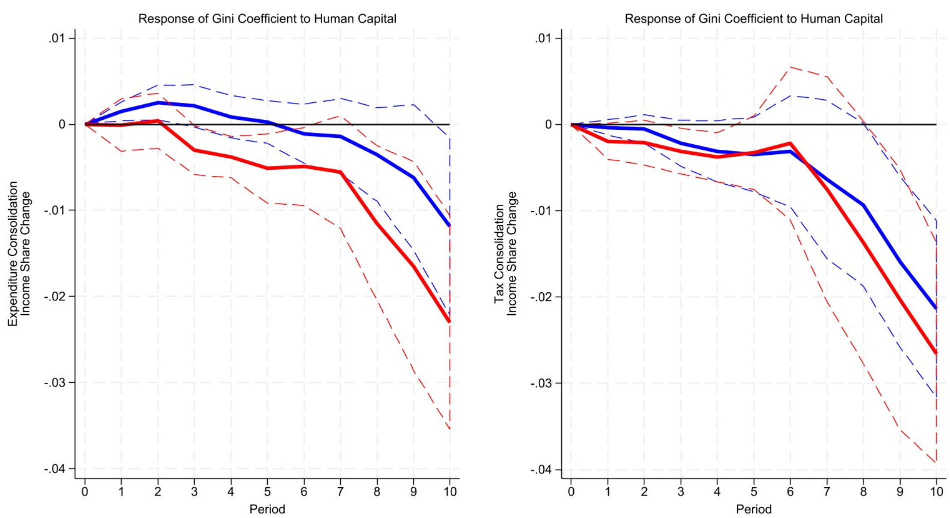
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 40: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

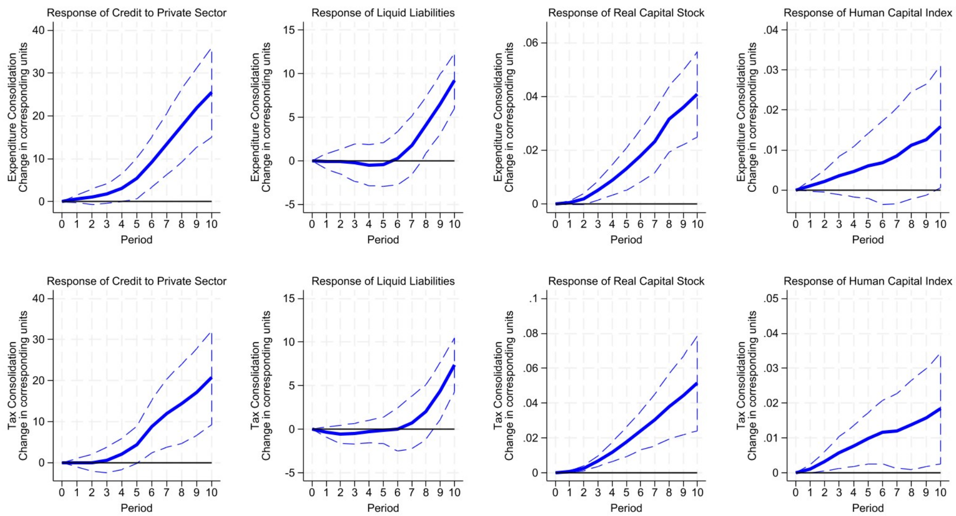
Figure 41: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

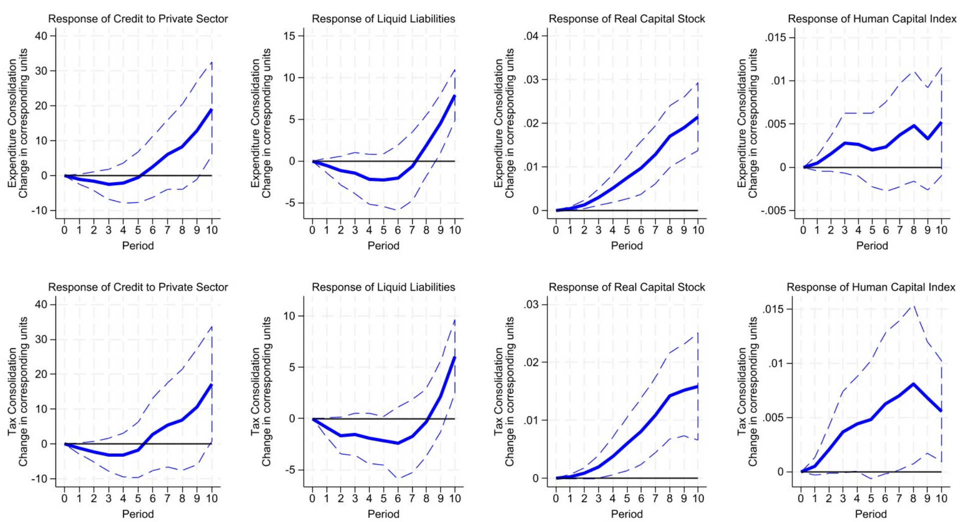
I Response of the Channels to Fiscal Consolidations

Figure 42: Response of Channels to Fiscal Consolidation



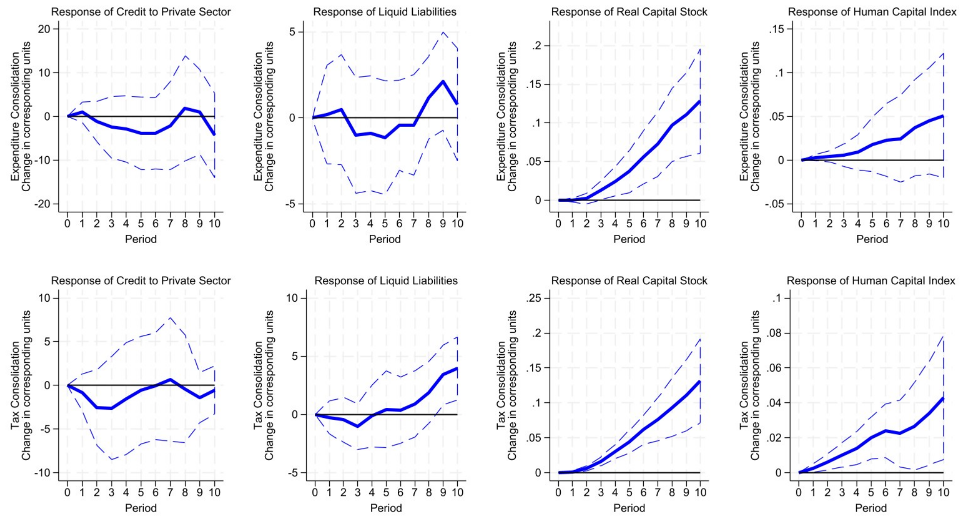
Note: The blue solid line is the β_h from equation (2) estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 43: Response of Channels to Fiscal Consolidation in Advanced Economies



Note: The blue solid line is the β_h from equation (2) estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

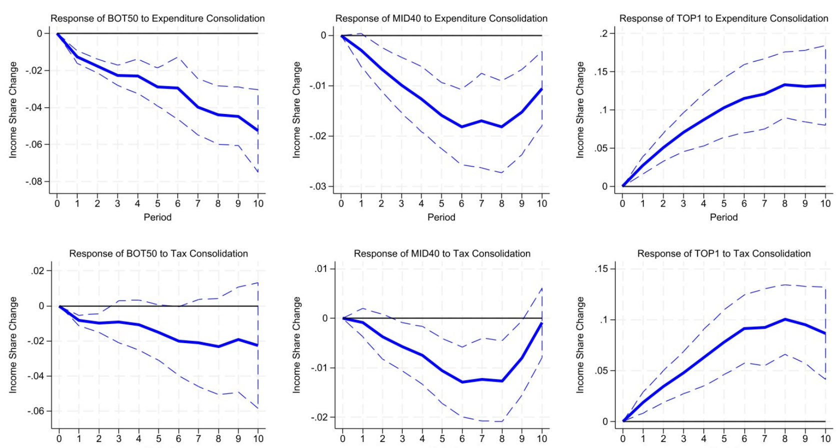
Figure 44: Response of Channels to Fiscal Consolidation in Emerging Economies



Note: The blue solid line is the β_h from equation (2) estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

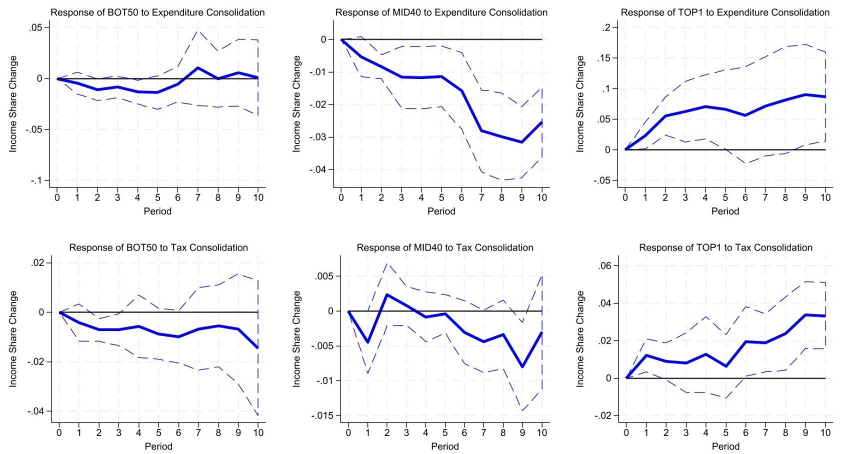
J Analysis with Dependent Variable in Log Difference

Figure 45: Effects of Fiscal Consolidation on Income Inequality



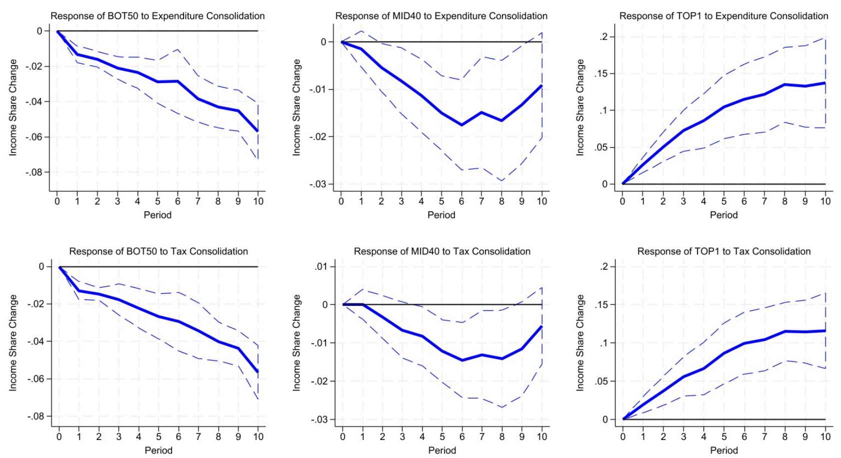
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 46: Effects of Fiscal Consolidation Size on Income Inequality



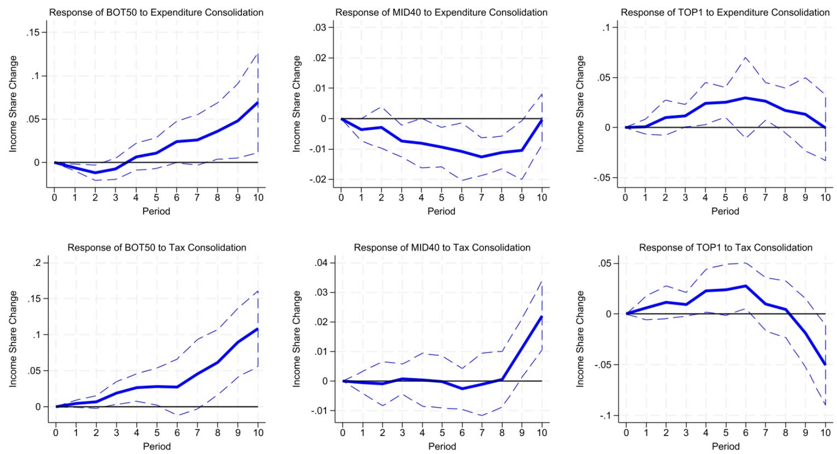
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 47: Effects of Fiscal Consolidation on Income Inequality in Advanced Economies



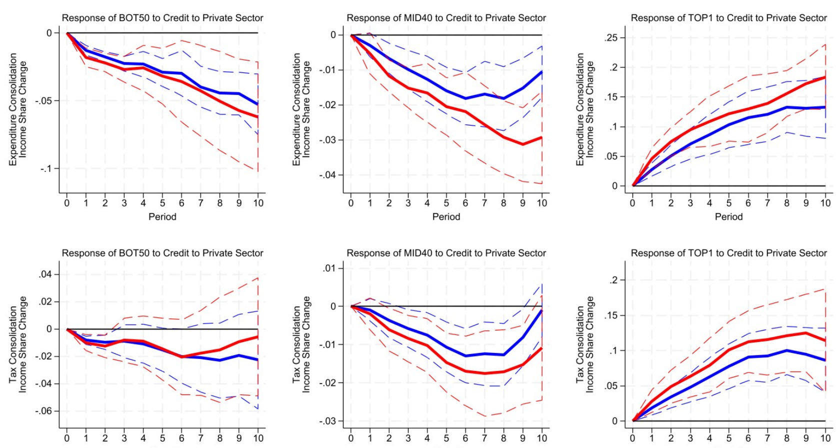
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 48: Effects of Fiscal Consolidation on Income Inequality in Emerging Economies



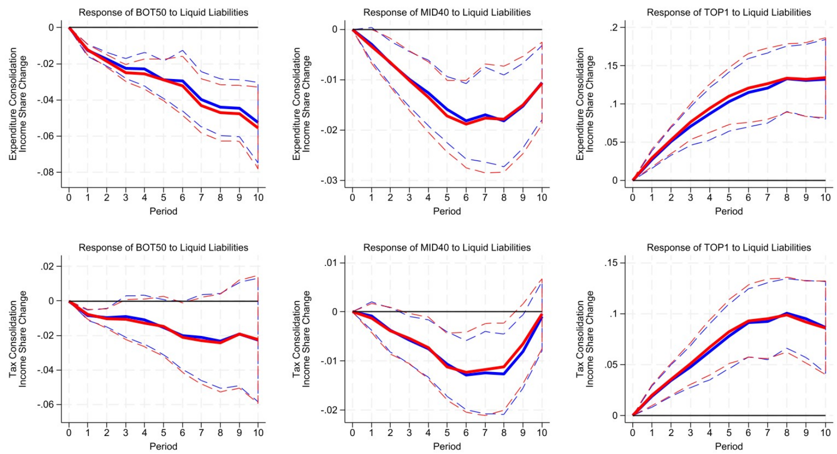
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 49: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality



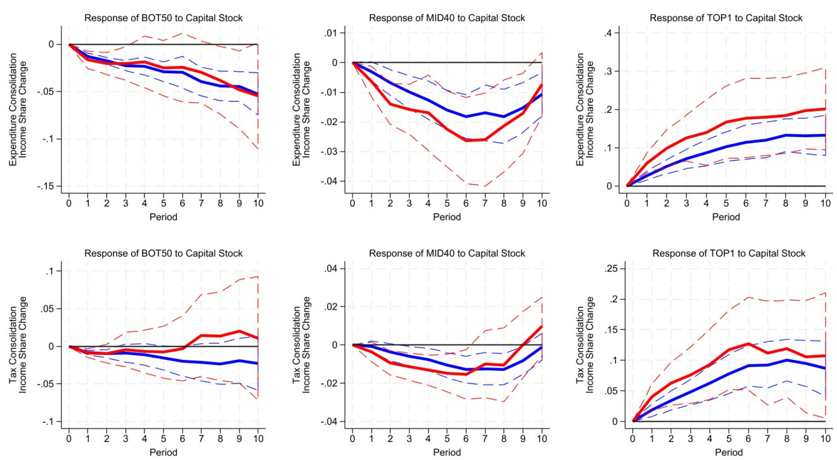
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 50: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality



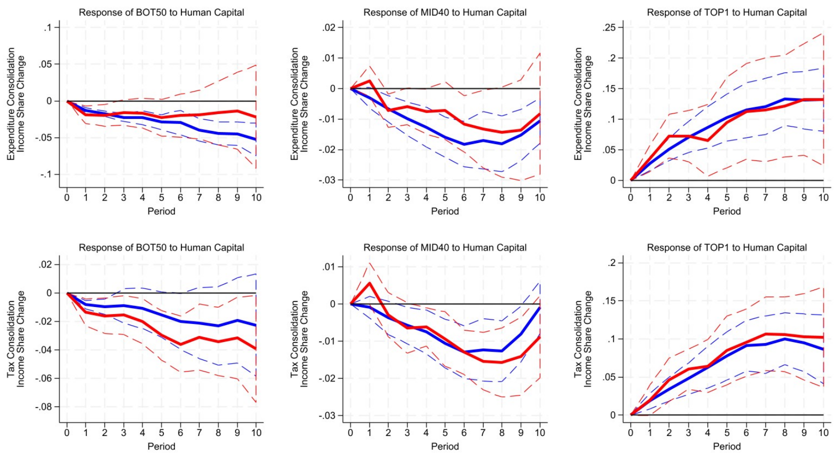
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 51: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality



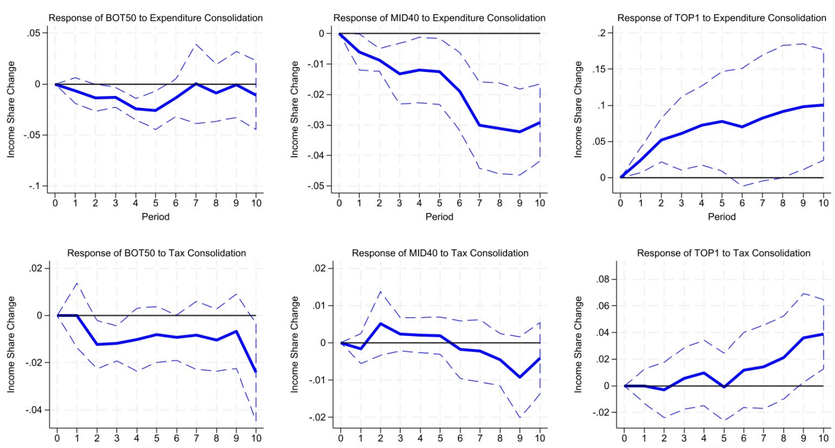
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 52: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality



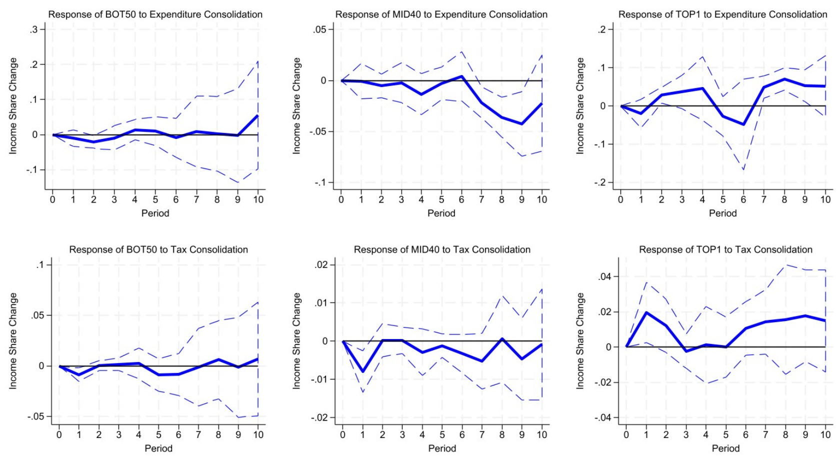
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 53: Effects of Fiscal Consolidation Size on Income Inequality in Advanced Economies



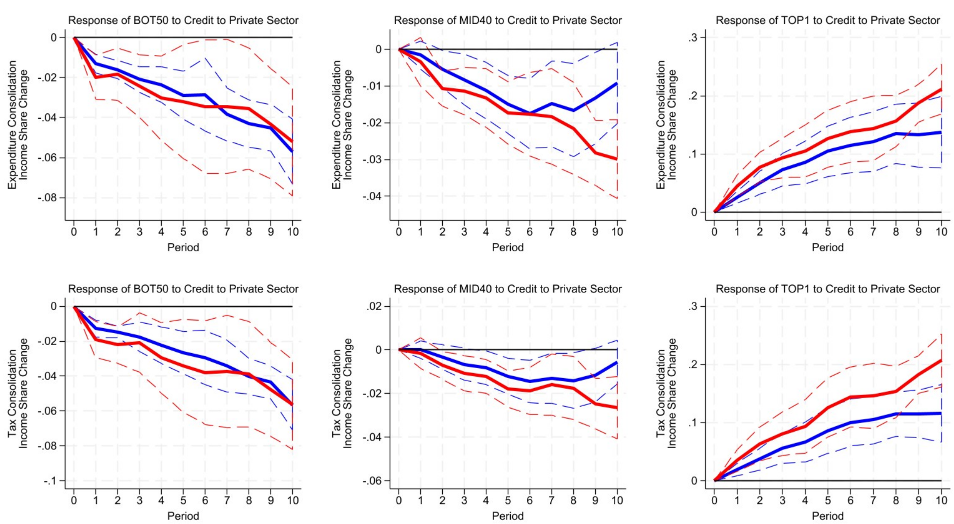
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 54: Effects of Fiscal Consolidation Size on Income Inequality in Emerging Economies



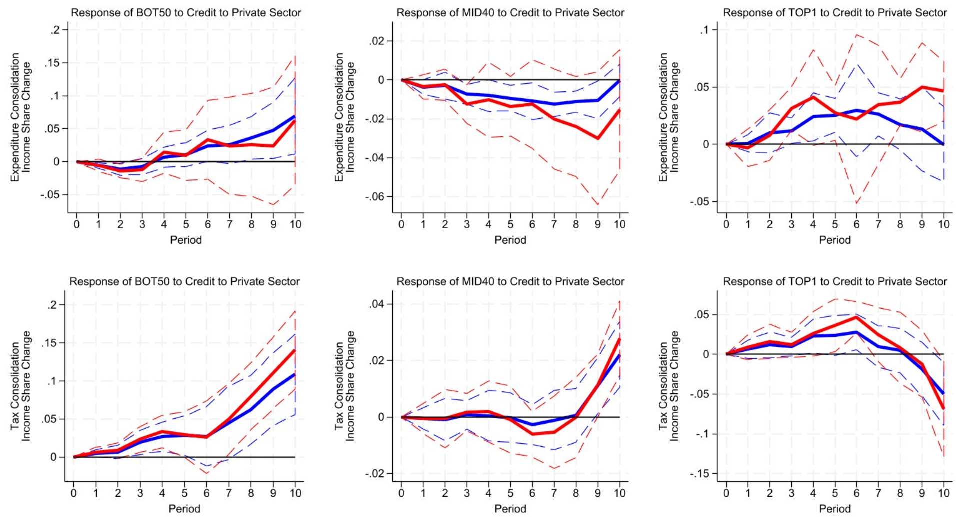
Note: The solid line is the β_h estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 55: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



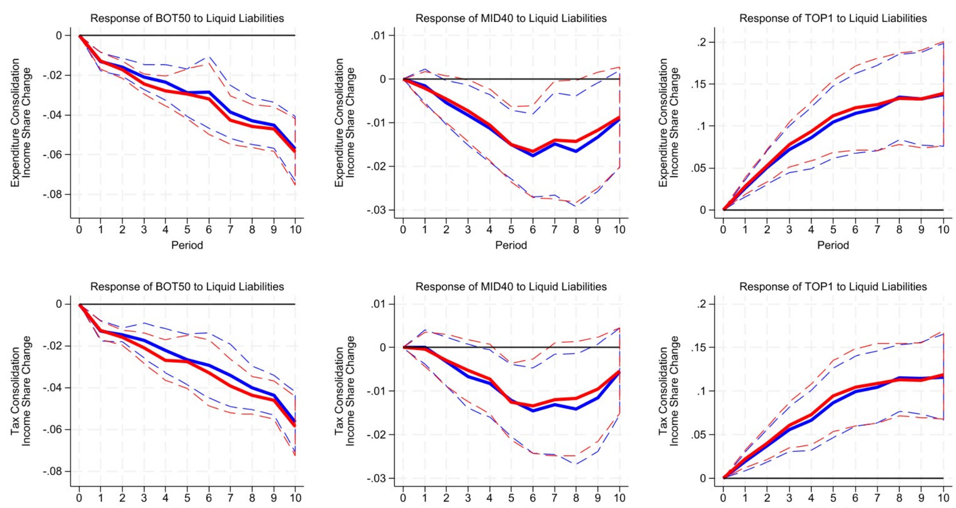
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 56: Credit to Private Sector Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



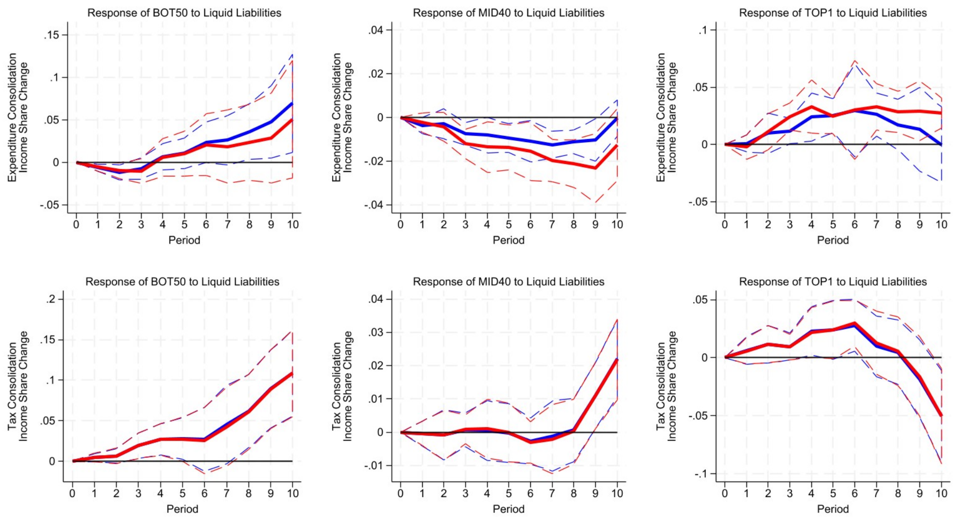
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 57: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



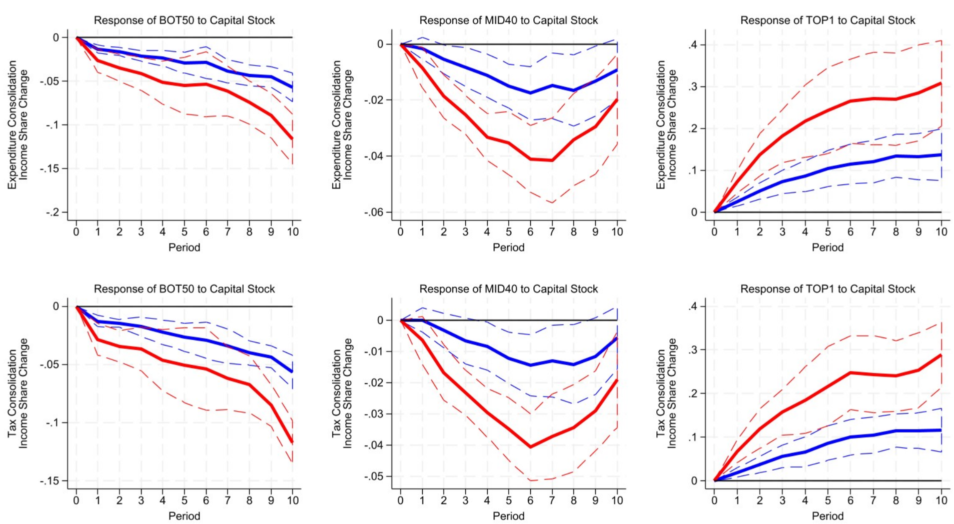
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 58: Liquid Liabilities Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



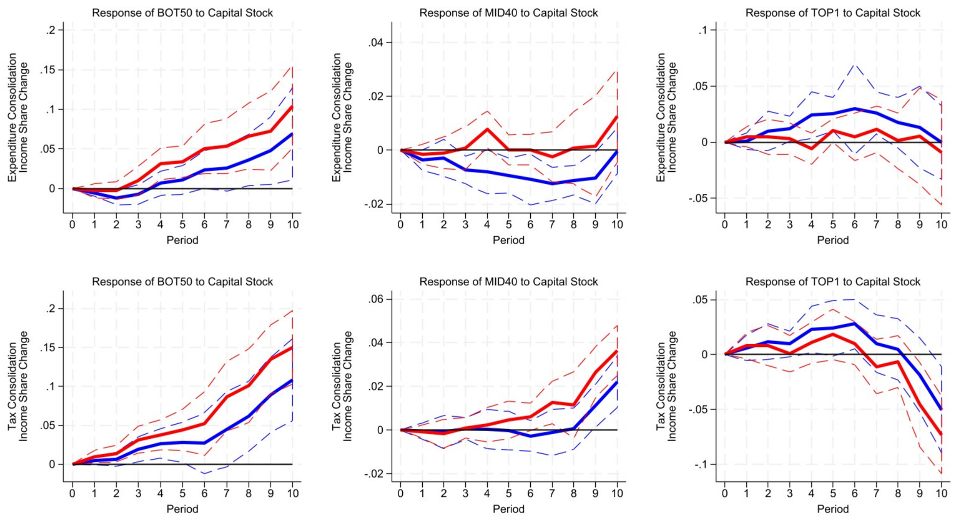
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 59: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



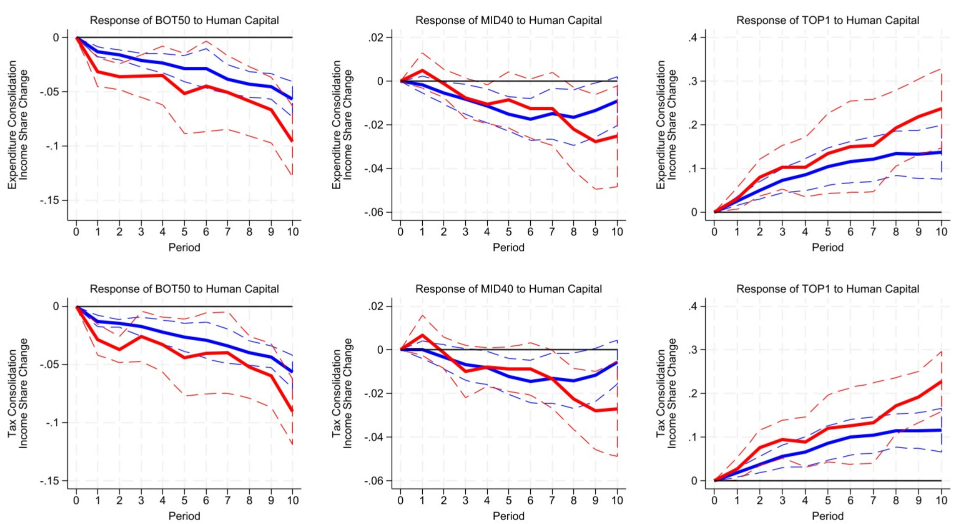
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 60: Capital Stock Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



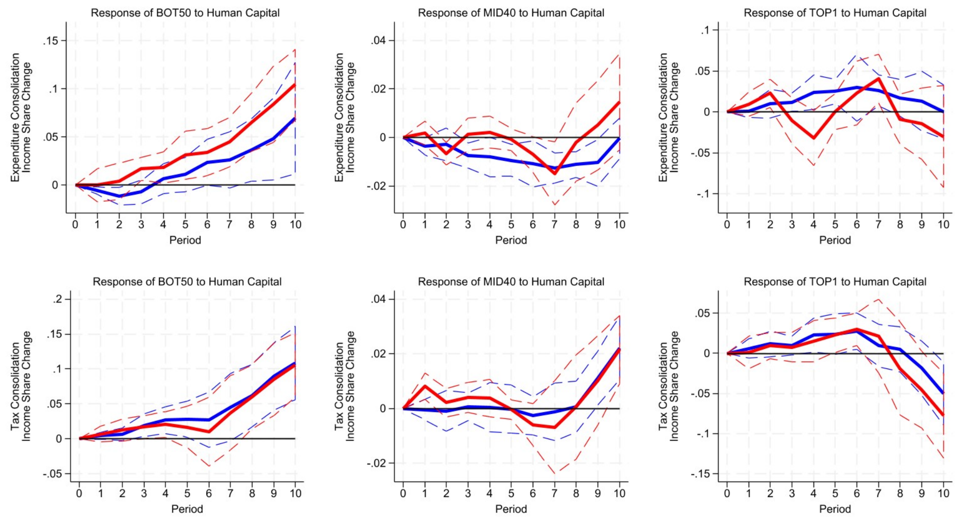
Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 61: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality in Advanced Economies



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

Figure 62: Human Capital Channel Effect of Fiscal Consolidation on Income Inequality in Emerging Economies



Note: The blue and red solid line is the β_h from equation (2) and (3), respectively, estimated using OLS. The shaded area is the 90 percent confidence intervals using Driscoll-Kray standard errors.

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