Disinflations and Income Distribution*

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Bringing down inflation is once again a priority in many countries. While there is broad consensus regarding the fact that policies aimed at bringing down inflation have adverse consequences on aggregate output and unemployment, at least in the short run, we know little about the distributional impact of disinflations. We find that during disinflations, the Gini indices rise, and the income share of the richest decile and especially the top 1 percent of the income distribution significantly increase. We discuss the implications of these findings for monetary policy.

JEL Codes: E31, E32, E43, E52, E58, D31.

1. Introduction

Many countries around the world are facing inflation rates that exceed, often by a large percentage, the central bank's targets. Policymakers are again facing the challenge of bringing down inflation rates. In this paper, we contribute to our understanding of disinflations by studying how different income distribution variables have evolved during disinflations.

Large disinflations are usually triggered by central banks' tight policies and constitute the cleanest form of negative aggregate demand shocks (Blanchard, Cerutti, and Summers 2015). The literature has shown that big disinflations, as defined below, reduce aggregate output (Ball 1994, Mazumder 2014). This literature has quantified output losses relative to changes in inflation and has studied the determinants of these losses.

While there is consensus around the fact that tight monetary policies aimed at reducing inflation rates generate *aggregate* output

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losses, we know little as to how these output sacrifices are distributed and whether they affect some portions of the population more than others. In line with this literature, our paper studies disinflations, but we do it with a focus on their distributive effects rather than their aggregate consequences.

Why would income distribution change during disinflations? Tight monetary policies and disinflation in general can have distributive effects through several channels (see, for instance, Koedijk, Loungani, and Monnin 2018; Nakajima 2015):

- The proportion of labor and capital income is heterogeneous across households, with poorer households depending more on labor income. If monetary policies affect these sources of income in different ways, they will have an impact on income distribution.
- The risk of becoming unemployed during a downturn is also unevenly distributed: for instance, Elsby, Hobjin, and Sahin (2010) document that during recessions, the unemployment rate of young or less educated individuals increases more than for other groups in the population.
- On the capital income side, the impact of monetary policies also has heterogeneous effects across the returns of different assets. Thus, monetary policies will affect the income distribution through this channel, inasmuch as households do not hold homogenous portfolios.
- The change in inflation itself can also have distributive consequences. Debtors tend to lose and creditors tend to benefit from (unexpected) lower inflation. This increases the real value of debts, potentially increasing inequality.
- Additionally, lower inflation could reduce the inflation tax, which could favor low-income households that rely more on cash than richer households (Erosa and Ventura 2002).
- Not all prices change at the same time nor in the same magnitude. Thus, the relative prices of goods and services change, and this can have distributive consequences.

Our contribution is also related to a recent branch of the literature that has studied the distributional consequences of monetary shocks *directly*. Several papers have found that the inequality

increases following contractionary monetary shocks: Coibion et al. (2017) report this finding for the United States, while Mumtaz and Theophilopoulou (2017) obtain similar conclusions for the United Kingdom. Furceri, Loungani, and Zdzienicka (2018) meanwhile corroborate the findings for a panel of 32 advanced and emerging countries, while Cantore, Ferroni, and León-Ledesma (2019), who study five developed economies, find that the share of output allocated to wages temporarily increases following an episode of monetary tightening. In our paper, we do not rely on the identification of monetary shocks (as those papers do) to study their impact on distributional outcomes. Our units of analysis, as in the sacrifice ratio literature, are disinflation episodes.

We use Mazumder's (2014) global sample of disinflations running from 1960 through 2009 to analyze how income distribution changes when inflation is brought down. Disinflations in Mazumder's sample are identified following Ball's (1994) methodology: episodes where trend inflation falls between a peak and trough by at least 1.5 percentage points. Moreover, it considers only episodes with inflation peaks below 20 percent, where the trade-offs between inflation and aggregate economic activity have been found to be relevant. In robustness estimations reported in the paper, we also run the baseline models using the Blanchard, Cerutti, and Summers (2015) sample of "intentional disinflations." The details of this identification of disinflations are explained later.

Using a sample of disinflations implies that our results do not hinge on estimated measures of monetary shocks (across countries and over time). This allows us to extend the study to a broader set of countries: papers relying on identifying monetary shocks require either long/high-frequency data on economic expectations or data that rely on narrative identification strategies (e.g., Romer and Romer 2004), which are harder to come by. Moreover, looking directly at disinflations provides an important complement to the already existing literature: as stated before, it is a well-established fact that disinflations scar aggregate economic performance, but we know less about the distributive consequences, if any, of these episodes. On the downside, an indirect way of identifying demand shocks might be less precise. For those more skeptical of this identification strategy, our results showing how measures of income inequality change in a typical disinflation episode are an important piece of information.

We find that during disinflations, Gini coefficients (both before and after taxes and transfers) increase, more so the longer the disinflations. The latter is consistent with the findings in the sacrifice ratio literature showing that long disinflations are associated with greater output losses (Mazumder 2014; Senda and Smith 2008). We also find that the shares of income going to the richest decile and especially to the top 1 percent increase during disinflations, while the income shares of the first seven deciles of the distribution, especially those in the middle—that is, the fourth, fifth, and sixth deciles—fall. Overall, the size of the effects on the income shares also rises with the length of disinflations.

2. Data

2.1 Disinflations

We use Mazumder's (2014) sample of disinflations identified on 189 countries from 1960 to 2009. He follows Ball's (1994) widely used identification strategy: he identifies peaks (with a 20 percent limit) and troughs on trend inflation series—estimated as the three-year centered moving average of the headline inflation. Disinflations are episodes when inflation falls between peak and trough by at least 1.5 percentage points. Table A.1 in Appendix A lists the 248 disinflationary episodes in Mazmuders's sample for which we also have Gini indices (described below). The average length of an episode is 4.9 years—5.7 years for the OECD countries and 4.6 for non-OECD disinflations. The average change in inflation between peak and trough is 5.7. It is somewhat larger in non-OECD countries (6.0) relative to OECD members (5.1).

2.2 Income Distribution

The first set of indicators we use are standardized Gini coefficients taken from the Standardized World Income Inequality Database (SWIID 6.1; Solt 2018). We use both market Gini indices (before taxes and transfers) and disposable indices (after taxes and transfers). In Table A.1 in Appendix A, we report the changes in Gini coefficients from peak to trough along the disinflation episodes. In Table A.2 we report further descriptive statistics of the Gini indices.

We have Gini indices for 54.4 percent of the disinflations in Mazumder's sample. As we explain in the next section, our empirical strategy requires data within disinflations but also outside them. The gaps in the Gini sample are not balanced over time or across countries. More developed countries have better data coverage and in general missing data are more frequent in the earlier parts of the sample. This unbalanced nature of our panel could bias the results. We address this concern using different subsamples and specifications. Our results are remarkably consistent.

The second set of income distribution variables that we study are the income shares over the different deciles of the distribution and for the top 1 percent, taken from the World Inequality Database (WID). The series are available for both market and disposable income.[1] We focus on OECD countries where we have data for 54 percent of our disinflationary episodes (data for non-OECD countries are only available for less than 10 percent of disinflations). Table A.3 in Appendix A provides the descriptive statistics for the shares of income for each decile and the top 1 percent.

2.3 Methodology

We use an estimation strategy based on local projections (Jordà 2005), with clustered standard errors. Other papers in the related literature, such as Coibion et al. (2017) and Furceri, Loungani, and Zdzienicka (2018), also use variants of this methodology.

Our main regressions are as follows:

$$\begin{aligned}\Delta^k Y_{i,t} &= Y_{i,t+k} - Y_{i,t} \\ &= \alpha_i^k + \gamma_1^k trend_t + \sum_{j=1}^{2} \gamma_{1+j}^k \Delta Y_{i,t-j} + \beta^k D_{i,t}^k + \gamma_4^k Y_{i,t} + \varepsilon_{i,t}^k,\end{aligned} \tag{1}$$

which we estimate for horizons $k = 1, \ldots 6$.

[1] The shares are estimated as the national income that goes to the adults (20+ years), equally split among the adults in the household.

$Y_{i,t}$ is the income distribution measure (Gini or income share as described in the previous section) of country i in year t; α_i^k is a country fixed effect; $trend_t$ is a linear trend; and $\Delta Y_{i,t-j}$ are lags (two in the baseline case) for changes in the income distribution measure.

Unlike a specification where the dummy is equal to 1 only at the start of the episode, our strategy recognizes that a disinflationary episode is not necessarily a one-year-long shock. For an episode in country i with a peak in period 0 and a trough in period T, $D_{i,t}^k = 1$ for $t = 0$ up to $t = T - k$. In other words, $D_{i,t}^k$ is a dummy variable equal to 1 *during* a disinflationary episode, and zero otherwise. This specification aims at studying the changes in each income distribution variable *during* disinflations, relative to periods outside disinflations. The dummy variable changes with the horizon (k) so that as the horizon k increases, $D_{i,t}^k$ is such that we still compare the outcomes *during* the disinflation relative to periods after the disinflation.

Hence, the coefficients β^k—our parameters of interest—represent the difference between two Y's that are k periods apart within a disinflationary episode, relative to two Y's, also k periods apart, during non-disinflationary times. β^1, for instance, represents the mean one-year change in Y within the disinflationary episodes relative to one-year changes in Y during non-disinflationary times.

Several clarifications are useful at this point. First, any failed attempts by central banks to bring inflation down are not identified as disinflationary episodes. If these attempts did influence inequality, then our β^k would be underestimated, as these periods would be in the "control" group. (Under this terminology, "during disinflations" is the treatment group.) Second, while k does not exactly represent the length of disinflationary episodes, the estimated effect for each k requires that an episode be at least k years long. In this sense, the evolution of the β^k along k is a proxy for the impact of the duration of a disinflationary episode on income distribution. Third, if disinflationary episodes affect the income distribution beyond the time of the trough (T), our coefficients will also underestimate the actual changes in income distribution along disinflations because the long-lasting outcomes would be in the control group.

3. Main Results

3.1 Gini

In Figure 1, we plot β^k along with 90 percent confidence intervals. As explained before, β^k represent the change in Gini coefficients that are k years apart within a disinflationary episode, relative to the same kinds of changes during non-disinflationary periods. The plot on the left reports the results for the whole sample; the other two plots report the effects for OECD countries and non-OECD countries. The latter two are estimated using Equation (1) with an extra interaction to estimate the differential effects over the two sets of countries. Results (not reported) are very similar if we run separate regressions—one for OECD and the other for non-OECD countries. In Table 1, we report the respective coefficients and their standard errors.

There are two general results, notwithstanding whether the coefficients are estimated with market or with disposable Ginis, for all countries or allowing for differential effects for OECD/non-OECD countries. First, all coefficients are positive, indicating that the Gini coefficients within disinflations increase relative to non-disinflationary times. The sacrifice ratio literature established that income decreases during disinflations; our result suggests that this aggregate income loss has also distributional consequences.

Second, the size and the statistical significance of all coefficients increase as k rises. The fact that the β^k are increasing over k suggests that the adverse effects on income distribution are a positive function of the length of a disinflationary episode. The latter result is coherent with the sacrifice ratio literature—studying the output losses per point of inflation during disinflationary episodes—as it has established that long disinflationary episodes tend to be costlier (e.g., Hofstetter 2008; Mazumder 2014; and Senda and Smith 2008).

What do the coefficients reported in Table 1 mean quantitatively? Take, for instance, β^5 in the first column: the five-year change in the Gini indices during a disinflationary episode increases by 0.533 relative to the five-year change during non-disinflationary periods.

There are other important findings in the different estimates reported in Figure 1 and Table 1. On the one hand, for the estimates with the complete sample, the market Gini coefficients are

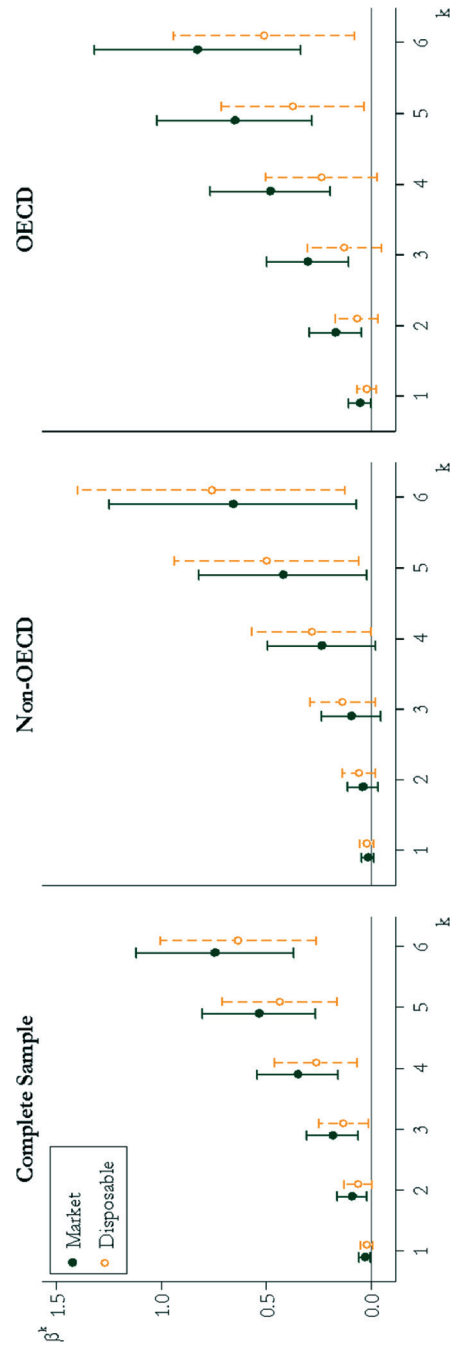


Figure 1. β^k **for** $Y =$ **Gini**

Note: The results are based on estimations of Equation (1): the plots report β^k (vertical axes) for different k's (horizontal axes), along with 90 percent confidence intervals. The β^k represent the change in Gini coefficients k periods apart within a disinflationary episode relative to non-disinflationary periods.

Table 1. β^k for Y = Gini

	Complete Sample		Non-OECD		OECD	
k	**Market**	**Disposable**	**Market**	**Disposable**	**Market**	**Disposable**
1	0.030*	0.020	0.016	0.019	0.054*	0.021
	(0.017)	(0.017)	(0.017)	(0.019)	(0.032)	(0.028)
2	0.090**	0.061	0.039	0.057	0.170**	0.067
	(0.043)	(0.039)	(0.044)	(0.048)	(0.076)	(0.061)
3	0.182**	0.130*	0.094	0.135	0.303**	0.126
	(0.074)	(0.072)	(0.086)	(0.094)	(0.119)	(0.107)
4	0.349***	0.261**	0.234	0.282	0.481***	0.237
	(0.118)	(0.119)	(0.157)	(0.173)	(0.173)	(0.162)
5	0.533***	0.435***	0.419*	0.497*	0.648***	0.372*
	(0.164)	(0.166)	(0.244)	(0.267)	(0.224)	(0.206)
6	0.744***	0.632***	0.657*	0.759*	0.828***	0.509*
	(0.228)	(0.226)	(0.358)	(0.387)	(0.299)	(0.262)

Note: Results based on estimations of Equation (1). The β^k represent the change in Gini coefficients k periods apart within a disinflationary episode, relative to the same change during non-disinflationary periods. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors are in parentheses.

statistically significant for all k's. For the disposable Gini, the significance starts after $k = 3$, that is, the taxes and transfers mitigate the distributive consequences of short disinflations but are not enough to offset the consequences for the longer ones. On the other hand, continuing with the comparison between market and disposable Gini, we find that the two sets of coefficients are very similar among them in non-OECD countries (i.e., the role of the state through taxes and transfers makes almost no difference) while in OECD countries, the disposable Gini estimates are only marginally significant for the longer episodes (taxes and transfers mitigate the distributive impact of disinflations except for the longest episodes).

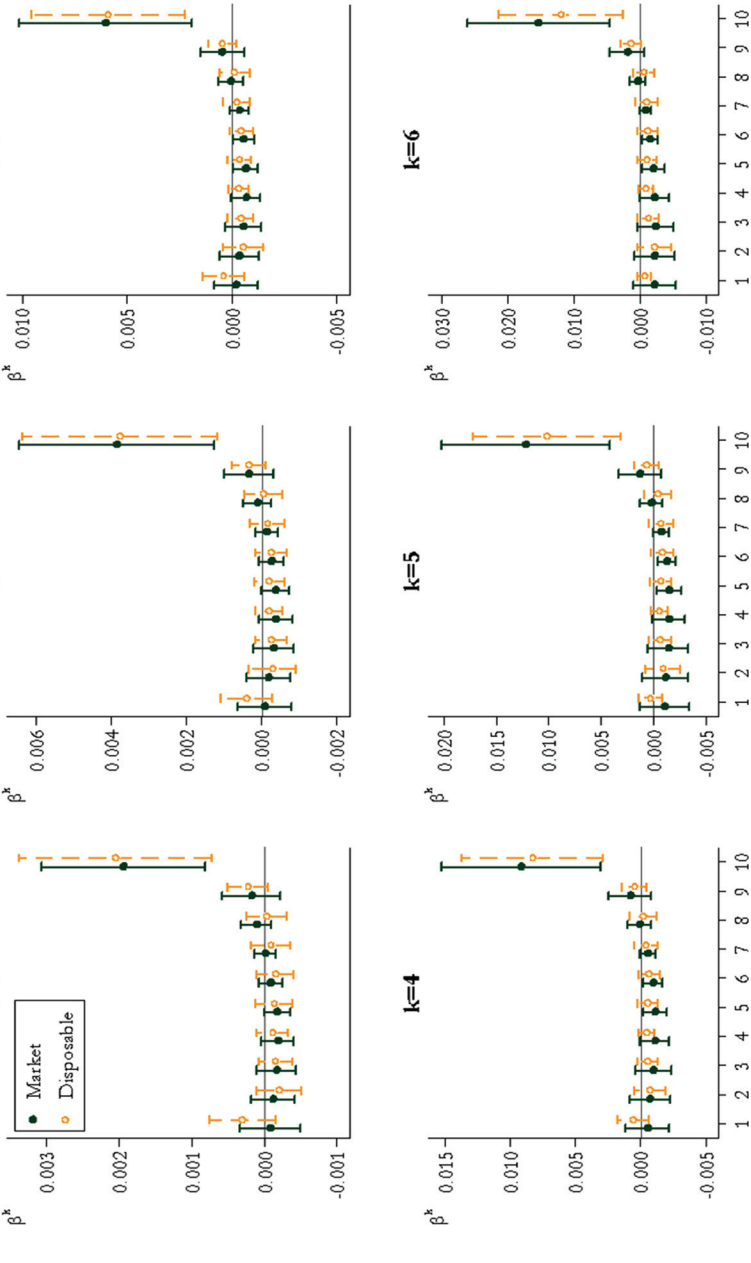
3.2 Income Shares: Deciles

We use the same empirical strategy described in Equation (1), only now with Y corresponding to the income share of each decile of the population instead of the Gini. We report the estimates for $k = 1$ through 6 in Figure 2 and Table 2.

The most salient result is the increase in the income share of the richest decile for all k's and for both market and disposable income. This means that—relative to times outside disinflations—within disinflations the income shifts towards the richest decile even after accounting for the distributional role of fiscal policy. How big are these effects? The size of the coefficient increases with the proxy for the length of the episode (note that the scale of the vertical axes changes). The largest coefficient (0.01539) corresponds to the upper decile measured with market income, and for $k = 6$. Since the average income share for the 10th decile is 0.29 (see Table A.3), this increase in the income share of the upper decile reaches 5.3 percent relative to the mean.

The results in Figure 2 follow a J-curve kind of pattern, with the larger negative values for the deciles in the middle of the distribution and the large positive values for the upper decile. For the market income, negative coefficients on the shares for the fifth and sixth deciles are also statistically significant when $k \geq 3$. As for the size: take for instance the fifth decile, for the $k = 6$ case: the coefficient is -0.002 (the mean income share of the decile is 0.08). The fact that the negative coefficients are not significant when estimated with

Figure 2. β^k, where Y = Income Shares for Each Decile



Note: The results are based on estimations of Equation (1) for OECD countries. The plots report β^k (vertical axes) for different deciles (horizontal axes) along with 90 percent confidence intervals. The β^k represent the change in the income share of each decile k periods apart within a disinflationary episode relative to the same change during non-disinflationary periods. The scale varies across the plots.

Table 2. β^k where Y = Income Shares for Each Decile

	Shares of Income: Coefficients					
	$k = 1$		$k = 2$		$k = 3$	
Deciles	β^k **Market**	β^k **Disp.**	β^k **Market**	β^k **Disp.**	β^k **Market**	β^k **Disp.**
1	–0.0001	0.0003	–0.0001	0.0004	–0.0002	0.0004
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0006)	(0.0006)
2	–0.0001	–0.0002	–0.0002	–0.0003	–0.0003	–0.0005
	(0.0002)	(0.0002)	(0.0004)	(0.0004)	(0.0006)	(0.0006)
3	–0.0002	–0.0002	–0.0003	–0.0003	–0.0006	–0.0004
	(0.0002)	(0.0001)	(0.0003)	(0.0003)	(0.0005)	(0.0004)
4	–0.0002	–0.0001	–0.0004	–0.0002	–0.0007	–0.0003
	(0.0001)	(0.0001)	(0.0003)	(0.0002)	(0.0004)	(0.0003)
5	–0.0002	–0.0001	–0.0004	–0.0002	–0.0007*	–0.0004
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0004)	(0.0003)
6	–0.0001	–0.0002	–0.0003	–0.0003	–0.0006*	–0.0004
	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)
7	0.000	–0.0001	–0.0001	–0.0002	–0.0003	–0.0002
	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)
8	0.0001	0.000	0.0001	0.000	0.000	–0.0001
	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0004)
9	0.0002	0.0002	0.0003	0.0003	0.0005	0.0004
	(0.0002)	(0.0002)	(0.0004)	(0.0003)	(0.0006)	(0.0004)
10	0.0019***	0.00200**	0.00380**	0.00380**	0.00600**	0.00590**
	(0.0007)	(0.0008)	(0.0016)	(0.0016)	(0.0025)	(0.0022)

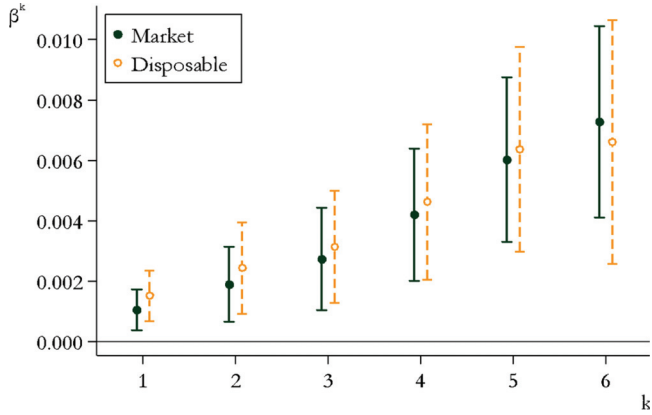
(*continued*)

Table 2. (Continued)

	Shares of Income: Coefficients					
	$k = 4$		$k = 5$		$k = 6$	
Deciles	β^k **Market**	β^k **Disp.**	β^k **Market**	β^k **Disp.**	β^k **Market**	β^k **Disp.**
1	–0.0005	0.0006	–0.0011	0.0003	–0.0022	–0.0008
	(0.001)	(0.0007)	(0.0014)	(0.0007)	(0.002)	(0.0006)
2	–0.0007	–0.0007	–0.0011	–0.0009	–0.0023	–0.0022
	(0.0009)	(0.0007)	(0.0014)	(0.001)	(0.0019)	(0.0015)
3	–0.001	–0.0006	–0.0014	–0.0006	–0.0024	–0.0013
	(0.0008)	(0.0005)	(0.0012)	(0.0007)	(0.0016)	(0.001)
4	–0.0011	–0.0005	–0.0015	–0.0006	–0.0023	–0.001
	(0.0007)	(0.0004)	(0.0009)	(0.0005)	(0.0013)	(0.0007)
5	–0.0011*	–0.0006	–0.0015**	–0.0007	–0.0020*	–0.0011
	(0.0005)	(0.0005)	(0.0007)	(0.0006)	(0.001)	(0.0009)
6	–0.001**	–0.0007	–0.0013**	–0.0009	–0.0015**	–0.0012
	(0.0004)	(0.0005)	(0.0005)	(0.0006)	(0.0007)	(0.0009)
7	–0.0006	–0.0004	–0.0007	–0.0007	–0.0009*	–0.0011
	(0.0004)	(0.0006)	(0.0004)	(0.0007)	(0.0005)	(0.001)
8	0.0001	–0.0002	0.0002	–0.0005	0.0003	–0.0007
	(0.0005)	(0.0006)	(0.0006)	(0.0008)	(0.0007)	(0.001)
9	0.0008	0.0004	0.0013	0.0006	0.0018	0.0013
	(0.001)	(0.0006)	(0.0012)	(0.0007)	(0.0016)	(0.0009)
10	0.00920**	0.00829**	0.01219**	0.01020**	0.01539**	0.01190**
	(0.0037)	(0.0033)	(0.0049)	(0.0043)	(0.0066)	(0.0057)

Note: The results are based on estimations of Equation (1) for OECD countries. The β^k represent changes in the income share for each decile, k periods apart during a disinflationary episode, relative to the same change during non-disinflationary periods. Standard errors are in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Figure 3. β^k, where Y = Income Share of the Top 1 Percent



Note: Based on estimations of Equation (1) for OECD countries. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

disposable income suggests that the effects are attenuated through taxes and transfers.

Summing up: inequality increases over the course of a disinflationary episode, and this can be explained by a gain in the income share of the richest decile at the expense of the deciles in the middle of the distribution. The size of the coefficients (in absolute terms) rises with k, that is, the distributive consequences are a positive function of how long a disinflationary episode lasts.

3.3 Income Shares: The Top 1 Percent

The top centile of the income distribution has received a lot of attention by scholars and media over the last few years (e.g., Alvaredo et al. 2013). We estimate Equation (1) to analyze how the share of income of the top 1 percent changes over the course of disinflationary episodes. In Figure 3 and Table 3 we report the β^k for the top centile of the income distribution (for OECD countries only).

Table 3. β^k where Y = Share of the Top 1 Percent

k	**Pre-tax**	**After Tax**
1	0.001**	0.002***
	(0.0004)	(0.0005)
2	0.002**	0.002**
	(0.0008)	(0.0009)
3	0.003**	0.003**
	(0.001)	(0.0011)
4	0.004***	0.004***
	(0.0013)	(0.0016)
5	0.006***	0.006***
	(0.0017)	(0.0021)
6	0.007***	0.007**
	(0.0019)	(0.0025)

Note: The results are based on estimations of Equation (1) for OECD countries. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode, relative to the same change during non-disinflationary periods. Standard errors are in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

The income shares of the top 1 percent increase for all k's during disinflationary episodes relative to non-disinflationary times. The coefficients are also statistically relevant for all k, before and after taxes. The figures are economically important: one way to emphasize the size of the effect is to note that 45 percent (0.007/0.01539) of the increase before taxes and transfers of the richest *decile* is explained by the gains of the top 1 percent. After taxes and transfers, the figure is even larger, 59 percent.

4. Further Results

4.1 Exploring the Determinants of the Increase in Inequality during Disinflations

One important question that cannot be answered within the methodological framework in Equation (1) is whether the size of the disinflation plays a role in shaping the episode's distributional consequences.

To address the question, we explore how the changes in Gini coefficients *within* disinflations are correlated with the characteristics of the episodes—namely, the length and the change in inflation from peak to trough. These types of regressions are standard in the sacrifice ratio literature, except there the dependent variable is the output loss per point of inflation. In that literature, one robust result is that slow disinflations are costlier. The literature explains this finding, arguing that sharp regime shifts enhance the credibility and allow faster adjustments of inflation expectations and thus less painful price slowdowns (e.g., Ball 1994; De Roux and Hofstetter 2014).

We run regressions where each observation corresponds to one disinflation episode (e):

$$Gini_e^{trough} - Gini_e^{peak} = \alpha_0 + \alpha_1 length_e + \alpha_2(\pi_e^{peak} - \pi_e^{trough}) + \nu_e. \quad (2)$$

The descriptive statistics for the data used in these regressions are reported in Table A.4 in Appendix A and the results are reported in Table 4.

The change of Gini coefficients during disinflations does depend on its length: the longer the episodes, the larger the increase in the market Gini. Each extra year increases the difference between the Gini at the peak and the trough by 0.288 points. The same way the sacrifice ratio literature establishes that longer disinflations are more harmful to output, we establish that the consequences on Gini go in the same direction. The disinflations' size (change in inflation between peak and trough) does not seem relevant.

4.2 Unemployment: Exploring Channels

Amberg et al. (2021), using administrative data from Sweden, show that the labor income reaction to monetary policy shapes its distributional effects, especially at the lower deciles of the distribution; capital incomes matter more to understand the reaction in the upper tail of the distribution. While in our setting, following many countries over a long period of time, it's not possible to find data to analyze unemployment by income deciles, looking at the behavior of aggregate unemployment is in any case informative as to the channels that might explain our results.

Table 4. Determinants of the Change in Market Gini

		Length	$\Delta\pi$
Complete Sample		0.2880***	–0.0246
		(0.0548)	(0.0289)
N	212		
R^2	0.122		
R^2 Adjusted	0.113		
Non-OECD		0.0828	0.0338
		(0.0562)	(0.0274)
N	142		
R^2	0.0427		
R^2 Adjusted	0.0289		
OECD		0.4219***	–0.0517
		(0.1244)	(0.0704)
N	70		
R^2	0.1571		
R^2 Adjusted	0.1319		

Note: Standard errors are in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

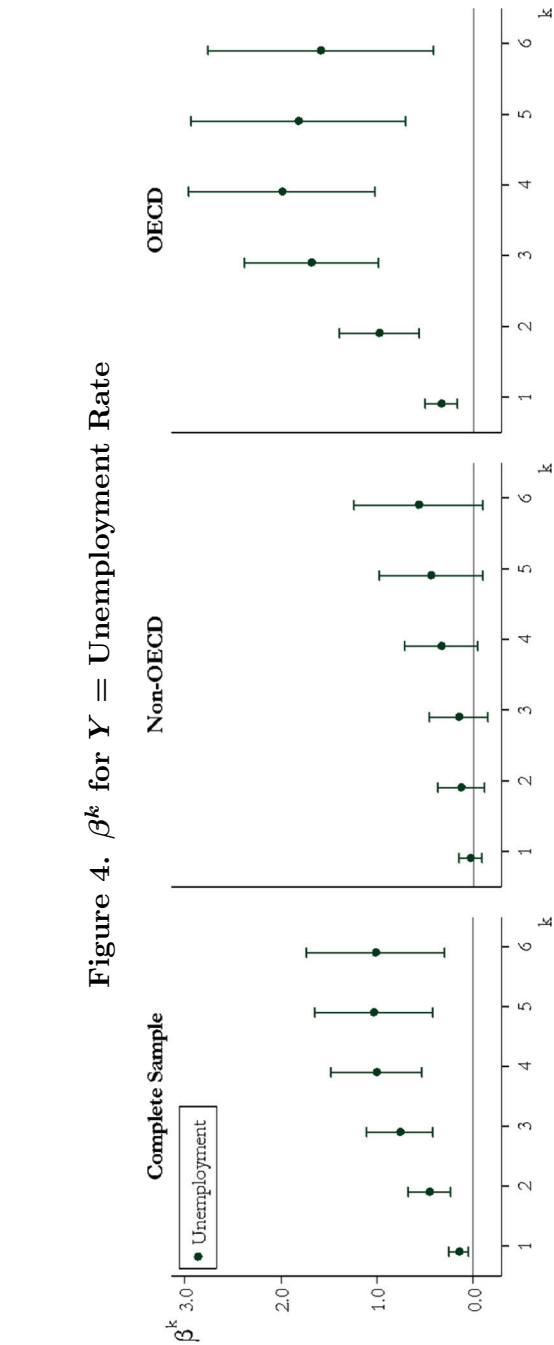
In Figure 4, we report the results when we estimate Equation (1) for the unemployment rate. Note that, as expected, during disinflations the unemployment rate goes up. Given that our results hint at losses in the income shares for all deciles except the upper ones (with strong statistical significance for the shares in the middle of the distribution), this increase during disinflations could reflect a rise in the unemployment rate especially for individuals in these deciles. Exploring further this conjecture remains an important task for future research.

5. Robustness

5.1 Intentional Disinflations

We have so far used Ball's (1994) method to identify disinflations. As discussed, his strategy is to detect large changes on trend inflation as a way of focusing on episodes where arguably the central bank is

Figure 4. β^k for Y = Unemployment Rate



Note: The results are based on estimations of Equation (1): the plots report β^k (vertical axes) for different k's (horizontal axes), along with 90 percent confidence intervals. The β^k represent the change in unemployment k periods apart within a disinflationary episode relative to non-disinflationary periods. Data for OECD countries come from OECD-Stats. For non-OECD countries the data are taken from WDI.

playing a role in pushing down the price increases. As Ball (1994) and Hofstetter (2008) show, the strategy works very well to flag the *successful* attempts of monetary policy to control the inflation rate.

There are other ways to identify the episodes. Blanchard, Cerutti, and Summers (2015) construct a sample of "intentional disinflations." They identify recessions in a sample of 23 advanced countries starting in 1960 and, if they find evidence of a monetary policy tightening coinciding with the recession, they flag the episodes as intentional disinflations, which according to them "represent the purest case of demand shocks."

Twenty of the intentional disinflations in Blanchard, Cerutti, and Summers (2015) overlap with disinflations in our sample. For the country and years in their sample, we estimate again the regressions based on Equation (1).[2] Notice that all the disinflations in our sample (within this group of 23 countries) that are not identified as intentional disinflations will now be part of the control group. If they did cause some effects on the income distribution, the coefficients will underestimate the effect. In Figures 5–7, we report the results.

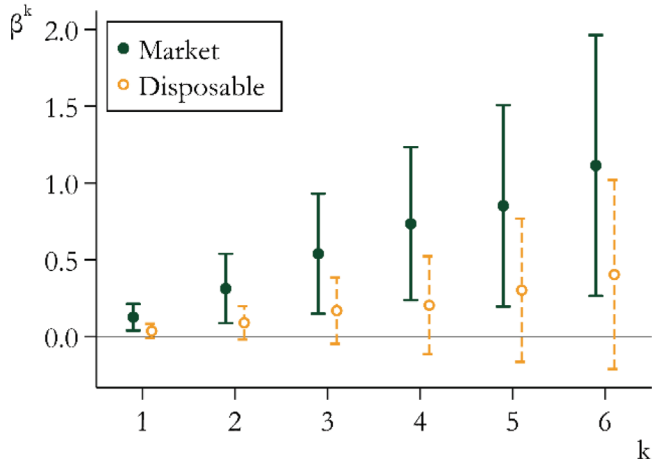
All the results follow a similar pattern relative to that in the baseline. For the market-based income distribution measures, the statistical significance is also comparable to the baseline cases. As for the disposable income distribution, most of the results are now not statistically significant. One way to interpret the outcome is that, in this sample of industrialized countries, the *intentional* disinflations affected the market-based income distribution but did not affect the (disposable) income distribution, thanks to the role of taxes and transfers. We believe though that the setting in these estimates is strongly against finding statistically relevant effects, as many of our identified disinflations are now in the control group.

5.2 Changes in the Specification of Equation (1)

No Trend. Equation (1) has a time trend and country fixed effects. The fixed effects pick up any time-invariant country-specific characteristics that might explain the evolution of the income distribution.

[2]To make sure results are comparable, we use the starting and ending dates of the episodes corresponding to the inflation peaks and troughs.

Figure 5. β^k for Y = Gini Coefficients



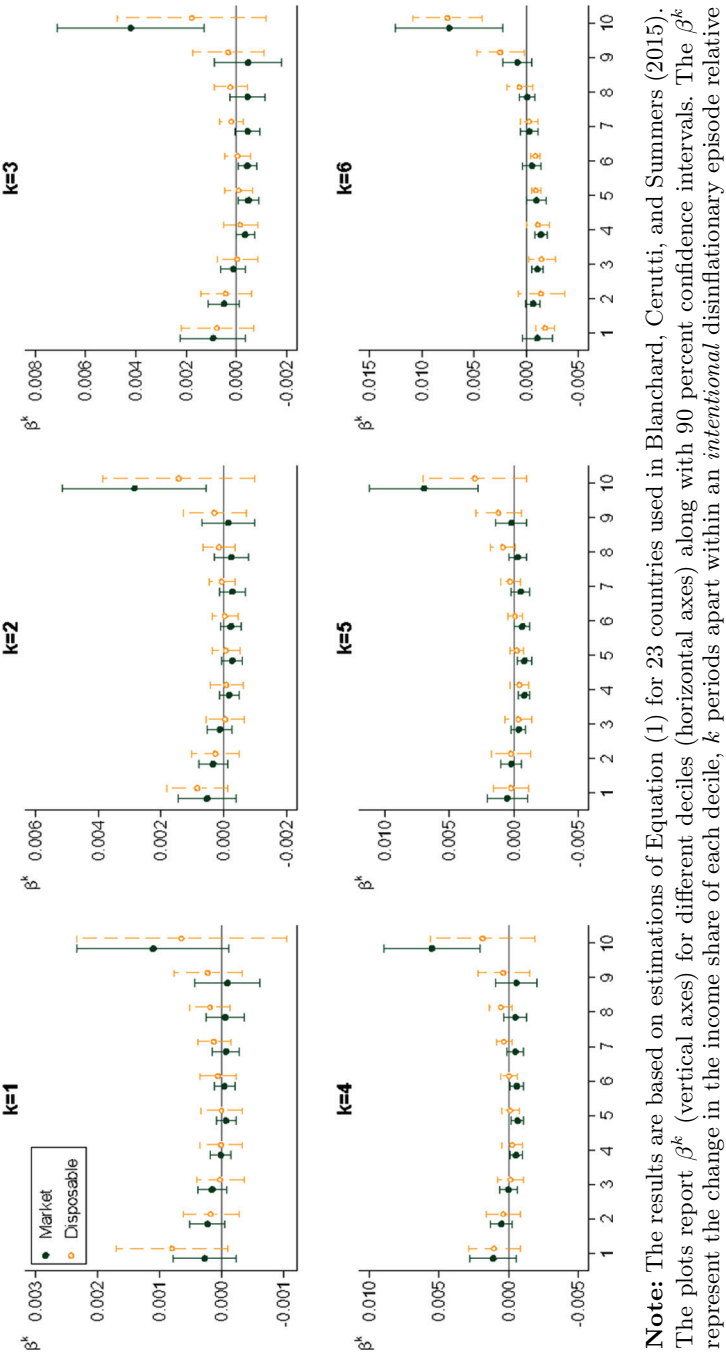
Note: The results are based on estimations of Equation (1) for the 23 countries used in Blanchard, Cerutti, and Summers (2015). The plots report β^k (vertical axes) for different k's (horizontal axes), along with 90 percent confidence intervals. The β^k represent the change in Gini coefficients k periods apart within an *intentional* disinflationary episode relative to non-intentional disinflationary periods.

The time trend takes care of the general trend of the changes in the income distribution across countries. We check the results if we re-estimate the models excluding the trend. Figures B.1, B.2, and B.3 in Appendix B report the results: the main conclusions hold.

Country-Specific Trends. The baseline specification does not control for country-specific time trends. While very demanding in terms of parameters to be estimated, it's still worth checking the outcomes in a setting with country-specific time trends. We report them in Figures B.4–B.6. The conclusions do not change.

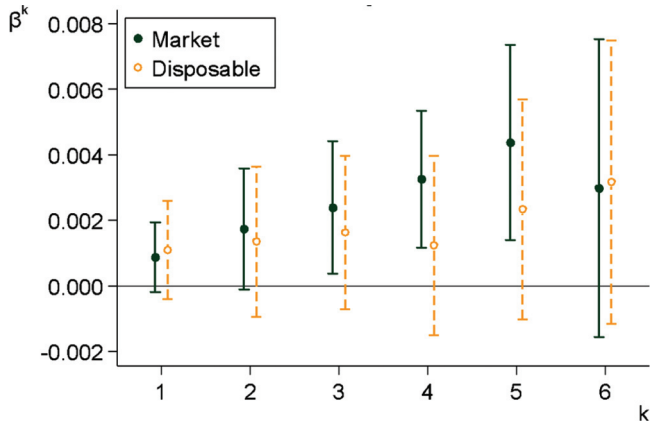
Number of Lags. In the baseline results we estimated Equation (1) using two lags, following the practice of most papers in the related literature. We checked the number of lags suggested by Bayesian and Akaike information criteria. The number changes across regressions, but in 85 percent of the cases both criteria suggested between one and three lags. We report the main outcomes for

Figure 6. β^k, where Y = Income Shares for Each Decile



Note: The results are based on estimations of Equation (1) for 23 countries used in Blanchard, Cerutti, and Summers (2015). The plots report β^k (vertical axes) for different deciles (horizontal axes) along with 90 percent confidence intervals. The β^k represent the change in the income share of each decile, k periods apart within an *intentional* disinflationary episode relative to the same change during non-intentional disinflationary periods. The scale varies across the plots.

Figure 7. β^k, where Y = Income Share of the Top 1 Percent



Note: Based on estimations of Equation (1) for 23 countries used in Blanchard, Cerutti, and Summers (2015). The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during an *intentional* disinflationary episode relative to the same change during non-intentional disinflationary periods.

market and disposable income measures if we use one and three lags in Appendix B, Figures B.7–B.12. The conclusions do not change.

6. Conclusions

We study the link between disinflations and income distribution. Disinflationary episodes are generally triggered by monetary policy actions that cool off aggregate economic activity. While there seems to be a consensus that tight monetary policies reduce economic activity, at least in the short run, the distributional consequences of these episodes have not received as much attention in the literature. Only recently have some papers identified the evolution of income distribution variables following monetary policy shocks (e.g., Coibion et al. 2017; Furceri, Loungani, and Zdzienicka 2018; and Mumtaz and Theophilopoulou 2017).

We analyze a global sample of disinflationary episodes, running from 1969 to 2009, for 189 countries (Mazumder 2014). We find that within disinflationary episodes, Gini indices increase. Moreover, in OECD countries the income shares of the top decile of the income distribution and especially that of the top 1 percent increase during disinflationary episodes. The income shares of the rest of the deciles, especially the fourth to sixth deciles, decrease.

Bringing down inflation has often been advertised as a policy aimed at protecting the poor, the reasoning being that they are the ones least able to protect themselves from price increases. Our results suggest that the *process* of bringing inflation down also affects the income distribution by increasing the Gini and the share of income that goes to the richest portions of the population. It is in the hands of central banks and the mandates societies give them to balance the goals with the side effects of the policies needed to achieve them. Voinea and Monnin (2017) point out that securing a fair distribution of the benefits and costs of price stability is a public good. The same could be argued with respect to disinflationary episodes.

Throughout the paper, we have interpreted the results as evidence that disinflations, often triggered by central banks' policies, cause economic activity to deteriorate, in a manner that is unevenly distributed across a population's income. Reverse causality is possible: rising inequality could reduce aggregate demand, because those at the top of the wealth distribution tend to consume a smaller share of their income than those at the bottom. This could *cause* the disinflation. Nevertheless, Ball (1994) and Hofstetter (2008) show that large disinflationary episodes, such as the ones examined in this paper, are mostly the consequence of monetary policies aimed at producing lower inflation rates. We also checked the results within a sample of "intentional disinflations" (Blanchard, Cerutti, and Summers 2015). Moreover, it looks unlikely that we will observe changes in income distributions rapid and strong enough to produce such sizable disinflationary processes. Nonetheless, the issue remains an interesting one for future study.

Appendix A. Descriptive Statistics

Table A.1. List of Episodes

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Algeria	1985	4	2.7		39.4	
Argentina	2003	3	6.3	48.2	46.8	–1.4
Armenia	2003	4	1.6	44.6	43.2	–1.4
Australia	1975	5	5.5	38.6	39.9	1.3
Australia	1981	5	3.7	40.5	43.1	2.6
Australia	1987	7	6.7	43.4	45.9	2.5
Australia	1995	4	2.2	47.4	48	0.6
Austria	1981	7	4.5		34.3	
Austria	1992	7	2.7	39.7	43	3.3
Bangladesh	1994	4	2.6	38.1	39.4	1.3
Bangladesh	1998	4	4.1	39.7	40.4	0.7
Barbados	1980	7	11.2	46.7	47	0.3
Barbados	1990	5	4.1	47.2	47.3	0.1
Barbados	1996	4	3.1	47.4	47.7	0.3
Belgium	1975	5	6.3		41.3	
Belgium	1982	6	6.7	41.8	42.7	0.9
Belgium	1990	9	2.0	44.3	48.3	4.0
Belize	1995	5	4.5	54.7	53	–1.7
Benin	2001	3	1.9		43.5	
Bolivia	1991	4	7.4	45.7	48.3	2.6
Bolivia	1995	8	8.3	49.2	53.4	4.2
Bosnia Herzegovina	1998	6	8.1		48.1	
Botswana	1980	6	5.0		62.1	
Botswana	1992	9	6.4	63.6	64.5	0.9
Botswana	2001	3	7.2	64.6	64.6	0.0
Brazil	2002	6	5.5	60.3	56.7	–3.6
Bulgaria	2001	4	3.3	34.9	35.1	0.2
Burkina Faso	1995	2	4.3	48.6	48.6	0.0
Burkina Faso	1997	4	3.3	48.7	47.7	–1.0
Burundi	2004	2	2.6	39.1	38.8	–0.3

(*continued*)

Table A.1. (Continued)

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Cambodia	1997	5	8.7	44	42.9	–1.1
Cameroon	1995	5	13.9		44.5	
Cameroon	2001	4	1.9	44.6	44.7	0.1
Canada	1974	4	1.6	39.8	40.6	0.8
Canada	1981	5	7.0	39.3	41.8	2.5
Canada	1990	4	4.0	42.2	44	1.8
Cape Verde Islands	1996	6	6.7		52.2	
Cape Verde Islands	2002	3	2.2	52.2	51.5	–0.7
Central African Republic	1990	3	1.6		54.1	
Central African Republic	1995	4	16.4	53.6	53	–0.6
Central African Republic	2002	2	2.0	52.2	52	–0.2
Chad	2001	3	7.8		42	
China	1979	5	3.2	34.6	34.7	0.1
China	1989	3	8.8	37.6	39.1	1.5
China	1995	6	18.2	42.5	47.7	5.2
Costa Rica	1995	8	8.1	40.4	43.5	3.1
Cote D'Ivoire	1987	4	7.2	42.1	41.9	–0.2
Cote D'Ivoire	1995	6	11.8	42.1	42.9	0.8
Croatia	1999	5	3.7	42.8	43	0.2
Cyprus	1980	8	8.8		44.9	
Cyprus	1992	7	3.0	45.6	46.3	0.7
Czech Republic	1997	7	7.7	43.5	46.1	2.6
Denmark	1981	6	7.3	41.8	42	0.2
Denmark	1988	7	2.7	42.5	44.4	1.9
Djibouti	1995	8	3.8		42	
Dominican Republic	1996	2	2.6	48.5	48.7	0.2

(*continued*)

Table A.1. (Continued)

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Egypt	1981	2	1.6	46.7	47.1	0.4
Egypt	1990	4	8.0	50.3	51.3	1.0
Egypt	1994	8	9.4	51.6	52.8	1.2
Equatorial Guinea	2002	5	3.4		50.8	
Estonia	2001	3	1.8	50	49.6	–0.4
Ethiopia	1994	4	13.3		36.8	
Ethiopia	1998	4	6.3	35.8	33.9	–1.9
Fiji	1975	4	6.0		44.8	
Fiji	1980	6	7.3	45	45.4	0.4
Fiji	1989	7	6.7	45.7	45.4	–0.3
Fiji	1997	5	2.0	45.1	44.5	–0.6
Finland	1975	5	7.3	41.2	40	–1.2
Finland	1981	7	7.0	39.4	39	–0.4
Finland	1989	7	5.0	39.9	46.2	6.3
Finland	2001	4	1.9	46.9	47.2	0.3
France	1975	3	2.2	47.5	46.3	–1.2
France	1981	7	10.1	48.1	49.3	1.2
France	1990	9	2.6	48.5	47.9	–0.6
Gambia	2002	5	15.8	47.9	47.3	–0.6
Georgia	2000	2	4.5	47.7	48	0.3
Germany	1974	5	3.1	39	41.3	2.3
Germany	1981	7	5.3	41.1	43.2	2.1
Germany	1993	7	3.1	45.4	46.8	1.4
Ghana	2004	2	5.3	42.9	43.2	0.3
Greece	1974	4	5.7	51.4	50.6	–0.8
Greece	1991	10	15.5	47.6	47.2	–0.4
Guatemala	1980	4	8.5		48.9	
Guinea	1992	7	15.2	45.7	44.6	–1.1
Guinea Bissau	2001	3	4.9	41.2	41.7	0.5
Hong Kong	1978	2	3.0	41.2	41.3	0.1
Hong Kong	1982	4	6.5	41.7	42.3	0.6
Hong Kong	1989	11	13.4	43.3	45.6	2.3
Hungary	1979	4	1.6	45.3	45.5	0.2

(*continued*)

Table A.1. (Continued)

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Iceland	2001	4	1.8	33.2	36.1	2.9
India	1973	5	16.2		42.5	
India	1982	4	3.4	43.3	43.8	0.5
India	1991	4	2.6	44.5	45	0.5
India	1997	6	5.8	45.6	47	1.4
Indonesia	1980	7	8.9	40.3	38.9	–1.4
Indonesia	2002	3	2.2	39.2	40.5	1.3
Iran	1976	4	3.4	54.2	55.7	1.5
Iran	2003	3	1.8	47.4	46.9	–0.5
Ireland	1975	4	6.4	47.6	48.5	0.9
Ireland	1980	8	10.3	49	50.9	1.9
Ireland	1990	5	5.2	50.4	49.8	–0.6
Ireland	2001	4	2.3	48.6	50.1	1.5
Israel	1990	5	7.7	47	48.2	1.2
Israel	1995	6	8.7	48.7	51.6	2.9
Israel	2001	4	2.1	52.4	51.9	–0.5
Italy	1975	4	2.5	48.9	47.1	–1.8
Italy	1981	7	13.8	45.2	44.6	–0.6
Italy	1990	4	1.8	43.7	46.5	2.8
Italy	1994	5	2.7	46.9	47.7	0.8
Jamaica	2004	3	2.0	56.2		
Japan	1974	6	10.3	35.9	36.3	0.4
Japan	1980	8	5.0	36.6	39.4	2.8
Japan	1990	6	2.6	40.6	42.4	1.8
Japan	1997	5	1.6	43.2	44.5	1.3
Jordan	1980	7	11.6		43.1	
Jordan	1990	5	15.0	45	45.2	0.2
Jordan	1997	4	3.2	43.8	43.5	–0.3

(*continued*)

Table A.1. (Continued)

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Kazakhstan	2000	4	3.6	37.6	36.8	–0.8
Kenya	1975	6	5.0		55.2	
Kenya	1981	7	7.5	54.9	52.9	–2.0
Kenya	1997	6	3.1	49	48.6	–0.4
Kiribati and Tuvalu	1992	6	4.0		47.4	
Kiribati and Tuvalu	2002	4	4.5	46	45.5	–0.5
Kuwait	1995	4	1.7		37.2	
Laos	2003	4	6.0	39.2	40.3	1.1
Lebanon	2003	2	2.0	43.3	42.9	–0.4
Lesotho	1987	4	3.2	56.5	57	0.5
Lesotho	1992	4	3.7	57.4	57.7	0.3
Lesotho	1996	5	9.4	57.5	56.8	–0.7
Lesotho	2003	3	10.3	56.5	56.5	0.0
Luxembourg	1982	6	6.7		38.3	
Luxembourg	1990	9	2.0	38.5	42.5	4.0
Macedonia	2001	4	4.3	54.7	55.7	1.0
Madagascar	1974	4	7.0	47.8	48.3	0.5
Madagascar	1987	4	9.0	47.4	46.8	–0.6
Madagascar	2001	2	4.4	45.4	45	–0.4
Malawi	1975	5	9.5	54.3	55.6	1.3
Malaysia	1974	3	6.8	47.5	48.6	1.1
Malaysia	1981	6	6.7	49.3	47.6	–1.7
Malaysia	1997	6	2.4	46.4	45.7	–0.7
Mali	1995	5	13.8	43.8	42.3	–1.5
Mali	2001	3	3.0	41.6	41.4	–0.2
Mauritania	1985	3	3.6		43.4	
Mauritania	1992	4	3.3	43.2	42.2	–1.0
Mauritania	1997	5	1.8	42.2	42.1	–0.1

(*continued*)

Table A.1. (Continued)

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Mauritius	1989	4	4.4	41.3	41.2	–0.1
Mauritius	1998	5	3.4	40.9	40.4	–0.5
Morocco	1981	4	2.0		41.2	
Morocco	1985	4	6.9	41.2	41.2	0.0
Morocco	1994	5	4.0	41.3	41.3	0.0
Mozambique	2003	4	4.8	46.7	46.4	–0.3
Namibia	1994	4	4.7	67.3	67	–0.3
Namibia	2004	4	4.8	66.2	65.6	–0.6
Nepal	1973	5	8.5		48.5	
Nepal	1981	4	4.8	47.3	46.5	–0.8
Nepal	1987	3	4.2	45.7	45.1	–0.6
Nepal	1991	4	5.8	44.6	43.7	–0.9
Nepal	1997	5	5.4	43.8	45.1	1.3
Netherlands	1975	4	4.7		45.1	
Netherlands	1981	7	6.3	46.3	47.2	0.9
Netherlands	2001	5	1.9	44.7	46	1.3
New Zealand	1981	3	7.5		40.6	
New Zealand	1986	8	13.4	41.4	45	3.6
New Zealand	1995	4	1.8	45.8	46.3	0.5
Nicaragua	1997	6	6.2	52.6	50.3	–2.3
Niger	1989	4	2.8		40.2	
Niger	1995	6	15.8	40.7	40.9	0.2
Niger	2001	3	2.8	41	41.1	0.1
Nigeria	2004	4	7.2	44.6	44.9	0.3
Norway	1975	4	2.8	37.3	37.4	0.1
Norway	1981	5	5.6	37.2	36.6	–0.6
Norway	1987	7	5.5	36.8	40.3	3.5

(*continued*)

Table A.1. (Continued)

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Pakistan	1980	7	6.1	36.4	36.7	0.3
Pakistan	1995	8	8.6	36.6	37	0.4
Panama	1972	5	2.9	52.1	52.3	0.2
Panama	1980	8	9.3	52.6	53.3	0.7
Papua New Guinea	1999	8	13.1	57.6	55.5	–2.1
Paraguay	2002	4	3.8	49.2	47.9	–1.3
Philippines	1973	4	11.0	47.5	47.4	–0.1
Philippines	1980	3	5.2	47.3	47.2	–0.1
Philippines	1990	5	6.2	48.6	49.7	1.1
Philippines	1997	5	5.0	50.3	48.6	–1.7
Portugal	1990	9	9.9	51.9	52.6	0.7
Republic of South Africa	1981	3	1.7	62.5	62.8	0.3
Republic of South Africa	1986	4	3.1	63.4	64	0.6
Republic of South Africa	1990	11	9.4	64.1	66.3	2.2
Republic of South Africa	2002	4	5.3	66.8	67.8	1.0
Rwanda	1983	5	9.4		38.4	
Rwanda	2005	2	1.7	52.7	52.7	0.0
Samoa	2003	2	2.1	50	50	0.0
Samoa	2005	2	3.6	49.9	49.9	0.0
Senegal	1995	5	13.4	43.6	42.9	–0.7
Singapore	1974	3	13.6	39.7	39.7	0.0
Singapore	1980	7	7.1	39.9	40.6	0.7
Singapore	1990	10	2.7	41.5	43.4	1.9
Slovakia	1994	4	4.4	41.1	43	1.9
Slovakia	2000	3	3.6	43.9	44.4	0.5
Slovakia	2003	4	3.5	44.6	43.1	–1.5
Slovenia	2001	5	5.4	37.7	39.7	2.0
Solomon Islands	2002	4	1.9		50.4	
South Korea	1991	4	2.9	29.9	29.9	0.0
South Korea	1997	4	3.3	30.7	31.6	0.9

(*continued*)

Table A.1. (Continued)

Country	**Year**	**Duration**	**$\Delta\pi$**	***Mkt.Gini^{peak}***	***Mkt.Gini^{trough}***	**Δ *Mkt.Gini***
Spain	1990	9	4.4	42.5	47.2	4.7
Sri Lanka	1974	3	6.4	38.5	39.7	1.2
Sri Lanka	1981	6	12.6	42	41.6	–0.4
Sri Lanka	1989	6	6.4	41.4	42.2	0.8
Sri Lanka	1997	3	4.9	43.8	44.8	1.0
Sri Lanka	2002	2	2.2	46.4	46.6	0.2
St. Kitts and Nevis	1998	4	3.3		42	
St. Lucia	1995	3	2.6	47	46.9	–0.1
St. Lucia	1999	4	2.6	46.9	46.7	–0.2
St. Vincent and the Grenadines	1997	5	1.7	51.1	50.3	–0.8
Swaziland	1986	5	6.0	50	51.7	1.7
Swaziland	1994	5	5.6	53.5	53.3	–0.2
Swaziland	2001	5	5.4	53.1	52.5	–0.6
Sweden	1981	7	6.7	41.2	42.8	1.6
Sweden	1990	4	5.7	44.2	46.7	2.5
Sweden	1994	5	2.8	47.6	47.4	–0.2
Switzerland	1981	7	4.0	39.8	39.8	0.0
Switzerland	1991	7	4.7	40.1	39.3	–0.8
Syria	1994	6	17.0		39.8	
Taiwan	1980	6	14.9	27.2	27.7	0.5
Taiwan	1995	4	2.7	31.2	30.3	–0.9
Thailand	1974	3	9.4	43.8	44.4	0.6
Thailand	1980	6	12.4	46.4	48	1.6
Thailand	1997	4	5.3	47.3	47.4	0.1
Tonga	1986	3	8.1	40	40.6	0.6
Tonga	1991	4	8.3	41.6	42.3	0.7
Tonga	2003	4	4.1	45	45.7	0.7

(*continued*)

Table A.1. (Continued)

Country	Year	Duration	$\Delta\pi$	$Mkt.Gini^{peak}$	$Mkt.Gini^{trough}$	Δ $Mkt.Gini$
Trinidad and Tobago	1974	4	7.0	44.3	44.3	0.0
Trinidad and Tobago	1980	7	6.8	44.2	44	–0.2
Trinidad and Tobago	1989	4	3.0	43.9	44	0.1
Trinidad and Tobago	1993	4	4.6	43.9	43.9	0.0
Tunisia	1985	5	2.9	43.4	42.9	–0.5
Tunisia	1990	4	2.7	42.8	42.7	–0.1
Tunisia	1994	7	2.4	42.6	42	–0.6
Uganda	1995	5	5.4	42.6	43.5	0.9
Uganda	2000	2	2.3	43.8	44.3	0.5
United Kingdom	1975	4	6.4	39	40.7	1.7
United Kingdom	1980	8	10.3	42.3	50	7.7
United Kingdom	1990	5	5.2	51.1	53.4	2.3
United States	1974	4	2.2	41.7	42.4	0.7
United States	1980	7	8.7	42.9	45.9	3.0
United States	1990	9	2.8	46.7	48	1.3
Uruguay	2003	4	7.8	53.2	53	–0.2
Venezuela	1980	4	4.4	40.3	40.1	–0.2
Vietnam	1997	5	4.8	40.7	41.3	0.6
Yemen	2005	2	1.5	41.8	42.1	0.3
Mean		4.9	5.7	45.5	45.7	0.5
Mean OECD		5.7	5.1	43.2	44.2	1.3
Mean Non-OECD		4.6	6.0	46.6	46.4	0.1
Median		4.0	4.9	44.6	45.0	0.3
Min.		2.0	1.5	27.2	27.7	–3.6
Max.		11.0	18.2	67.3	67.8	7.7
Standard Deviation		1.8	3.6	6.6	6.3	1.5

Table A.2. Mean (μ) and Standard Deviations (σ) of Market and Disposable Income Gini Indices

	Complete Sample				Non-OECD				OECD			
	Market		Disposable		Market		Disposable		Market		Disposable	
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ
1969–1979	43.9	6.9	36.8	9.5	42.2	5.5	29.5	7.6	45.2	7.5	42.0	7.1
1980–1989	44.4	7.1	36.8	9.6	42.8	5.2	28.9	6.9	45.4	7.9	41.5	7.7
1990–1999	45.6	6.7	38.4	9.1	45.0	5.3	30.1	7.1	45.8	7.1	41.4	7.7
2000–2009	46.2	6.4	39.3	8.3	46.8	4.7	30.9	6.1	46.0	6.8	41.5	7.4
1969–2009	**45.4**	**6.8**	**38.2**	**9.0**	**44.4**	**5.5**	**29.9**	**6.9**	**45.7**	**7.2**	**41.5**	**7.5**

Table A.3. Mean (μ) and Standard Deviations (σ) for the Shares of Income of Each Decile and for the Top 1 Percent, OECD Countries

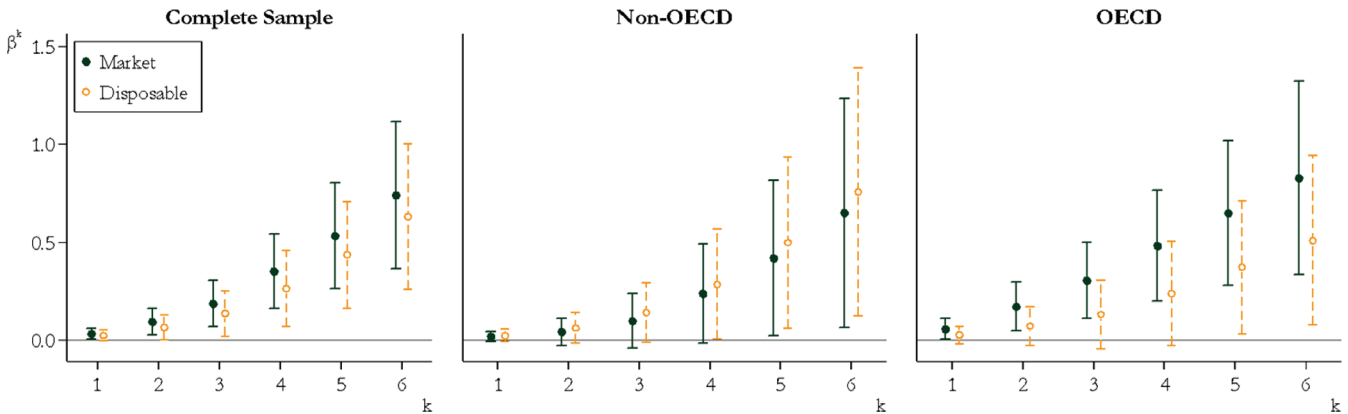
	Decile 1 (Poorest)				Decile 2				Decile 3				Decile 4			
	Pre-tax		After Tax		Pre-tax		After Tax		Pre-tax		After Tax		Pre-tax		After Tax	
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ
1969–1979	0.01	0.00	0.02	0.00	0.03	0.00	0.04	0.00	0.04	0.00	0.05	0.00	0.06	0.00	0.06	0.00
1980–1989	0.03	0.02	0.03	0.01	0.05	0.01	0.05	0.01	0.06	0.01	0.06	0.01	0.07	0.01	0.07	0.01
1990–1999	0.03	0.01	0.02	0.01	0.04	0.01	0.05	0.01	0.05	0.01	0.06	0.01	0.06	0.01	0.07	0.01
2000–2009	0.02	0.01	0.02	0.01	0.04	0.01	0.05	0.01	0.05	0.01	0.06	0.01	0.06	0.01	0.07	0.01
1969–2009	**0.03**	**0.01**	**0.02**	**0.01**	**0.04**	**0.01**	**0.05**	**0.01**	**0.05**	**0.01**	**0.06**	**0.01**	**0.06**	**0.01**	**0.07**	**0.01**
	Decile 5				**Decile 6**				**Decile 7**				**Decile 8**			
	Pre-tax		**After Tax**		**Pre-tax**		**After Tax**		**Pre-tax**		**After Tax**		**Pre-tax**		**After Tax**	
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ
1969–1979	0.07	0.00	0.08	0.00	0.08	0.00	0.09	0.00	0.10	0.00	0.10	0.00	0.12	0.00	0.10	0.00
1980–1989	0.08	0.01	0.08	0.01	0.09	0.01	0.09	0.01	0.10	0.00	0.11	0.00	0.12	0.00	0.11	0.00
1990–1999	0.07	0.01	0.08	0.01	0.09	0.01	0.09	0.01	0.10	0.01	0.10	0.00	0.12	0.01	0.10	0.00
2000–2009	0.07	0.01	0.08	0.01	0.08	0.01	0.09	0.01	0.10	0.01	0.10	0.00	0.11	0.01	0.10	0.00
1969–2009	**0.08**	**0.01**	**0.08**	**0.01**	**0.09**	**0.01**	**0.09**	**0.01**	**0.10**	**0.01**	**0.10**	**0.00**	**0.12**	**0.01**	**0.10**	**0.00**
	Decile 9				**Decile 10 (Richest)**				**Top 1 Percent**							
	Pre-tax		**After Tax**		**Pre-tax**		**After Tax**		**Pre-tax**		**After Tax**					
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ				
1969–1979	0.15	0.00	0.14	0.00	0.34	0.01	0.30	0.00	0.10	0.01	0.09	0.00				
1980–1989	0.14	0.01	0.14	0.01	0.25	0.05	0.24	0.05	0.06	0.02	0.06	0.02				
1990–1999	0.14	0.01	0.14	0.01	0.29	0.08	0.26	0.04	0.08	0.05	0.07	0.02				
2000–2009	0.14	0.01	0.14	0.01	0.31	0.06	0.28	0.04	0.09	0.04	0.08	0.02				
1969–2009	**0.14**	**0.01**	**0.14**	**0.01**	**0.29**	**0.07**	**0.26**	**0.05**	**0.08**	**0.04**	**0.07**	**0.02**				

Table A.4. Descriptive Statistics of the Episodes Used in the Estimation of Regression 2

	Complete Sample	**Non-OECD**	**OECD**
Number of Episodes	212	142	70
Average $Gini^{trough} - Gini^{peak}$ Market	0.52	0.11	1.34
Average $Gini^{trough} - Gini^{peak}$ Disposable	0.24	0.09	0.55
Average Length	4.96	4.58	5.73
Average $\pi_e^{peak} - \pi_e^{trough}$	5.70	6.02	5.04

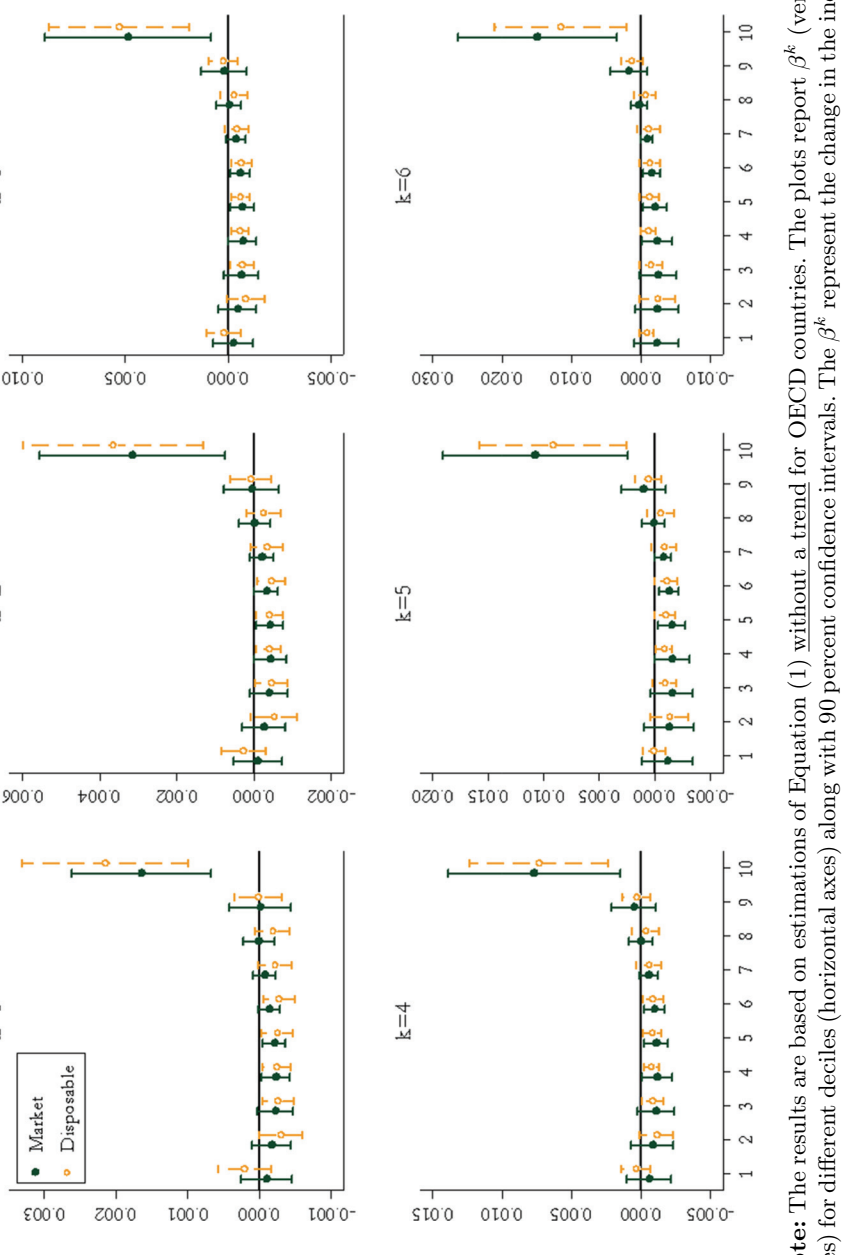
Appendix B. Robustness

Figure B.1. β^k for Y = Gini Coefficients



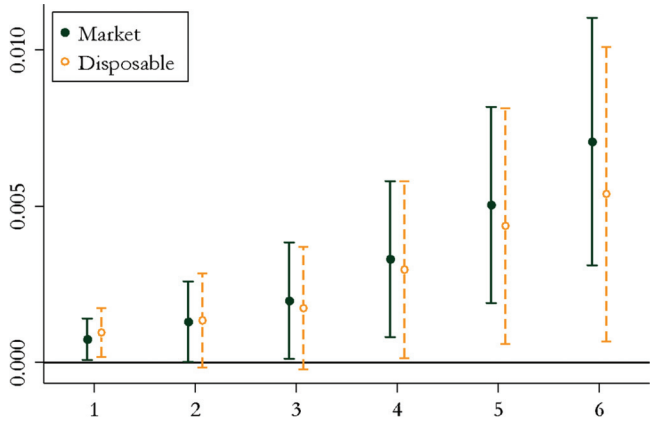
Note: The results are based on estimations of Equation (1) without a trend: the plots report β^k (vertical axes) for different k's (horizontal axes), along with 90 percent confidence intervals. The β^k represent the change in Gini coefficients k periods apart within a disinflationary episode relative to non-disinflationary periods.

Figure B.2. β^k, where Y = Income Shares for Each Decile



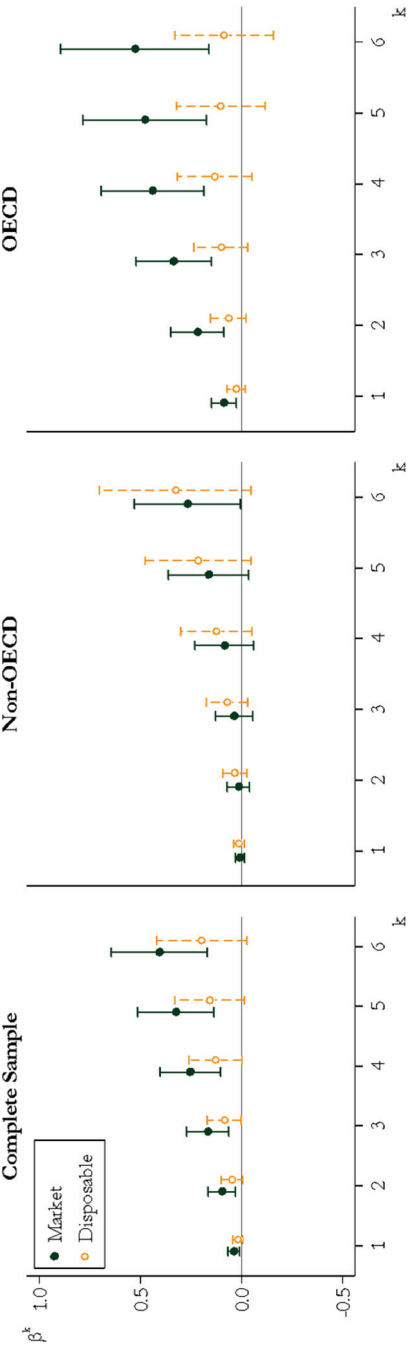
Note: The results are based on estimations of Equation (1) without a trend for OECD countries. The plots report β^k (vertical axes) for different deciles (horizontal axes) along with 90 percent confidence intervals. The β^k represent the change in the income share of each decile, k periods apart within a disinflationary episode relative to the same change during non-disinflationary periods. The scale varies across the plots.

Figure B.3. β^k, where Y = Income Share of the Top 1 Percent



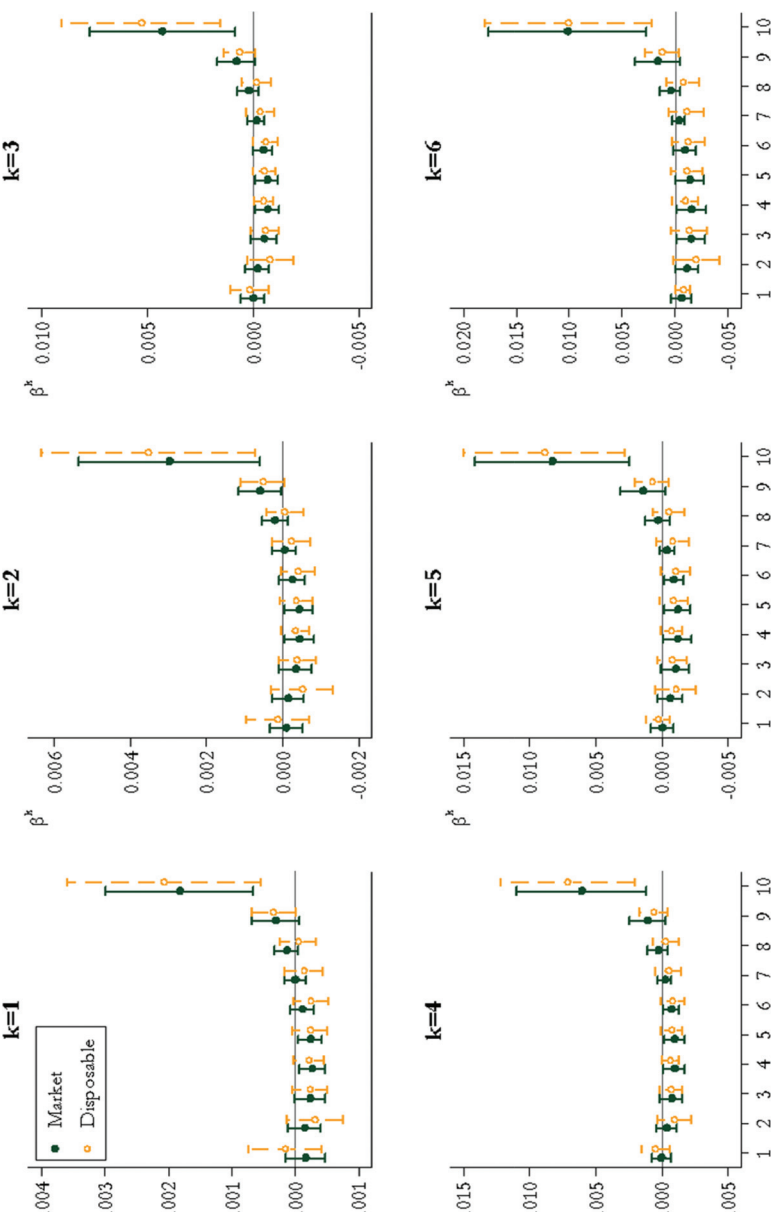
Note: Based on estimations of Equation (1) for OECD countries, without a trend. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

Figure B.4. β^k for Y = Gini Coefficients



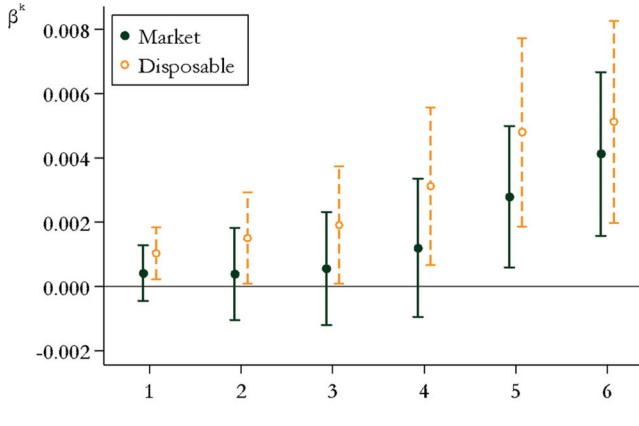
Note: The results are based on estimations of Equation (1) with country-specific trends: the plots report β^k (vertical axes) for different k's (horizontal axes), along with 90 percent confidence intervals. The β^k represent the change in Gini coefficients k periods apart within a disinflationary episode relative to non-disinflationary periods.

Figure B.5. β^k, where Y = Income Shares for Each Decile



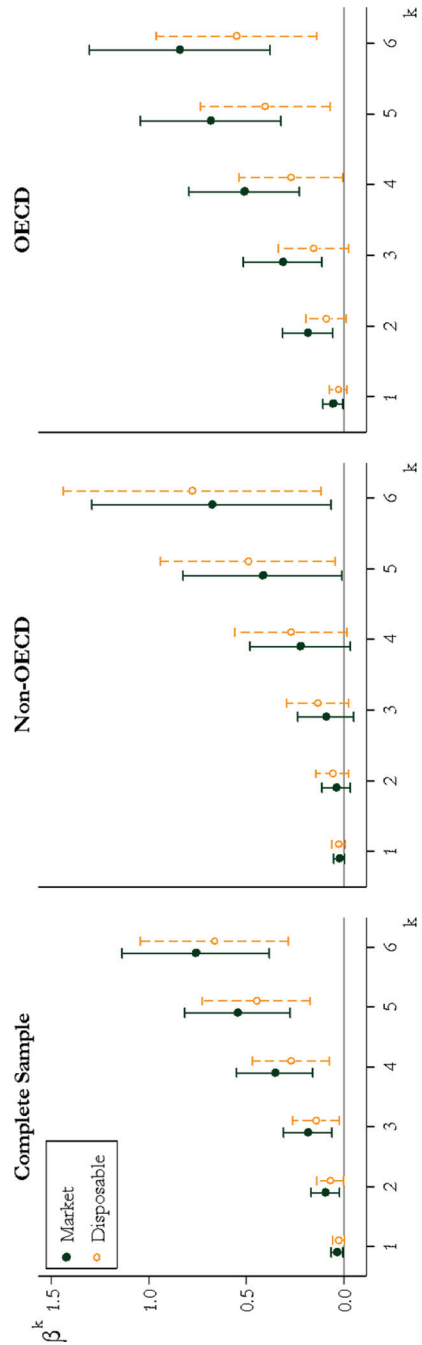
Note: The results are based on estimations of Equation (1) with country-specific trends for OECD countries. The plots report β^k (vertical axes) for different deciles (horizontal axes) along with 90 percent confidence intervals. The β^k represent the change in the income share of each decile, k periods apart within a disinflationary episode relative to the same change during non-disinflationary periods. The scale varies across the plots.

Figure B.6. β^k, where Y = Income Share of the Top 1 Percent



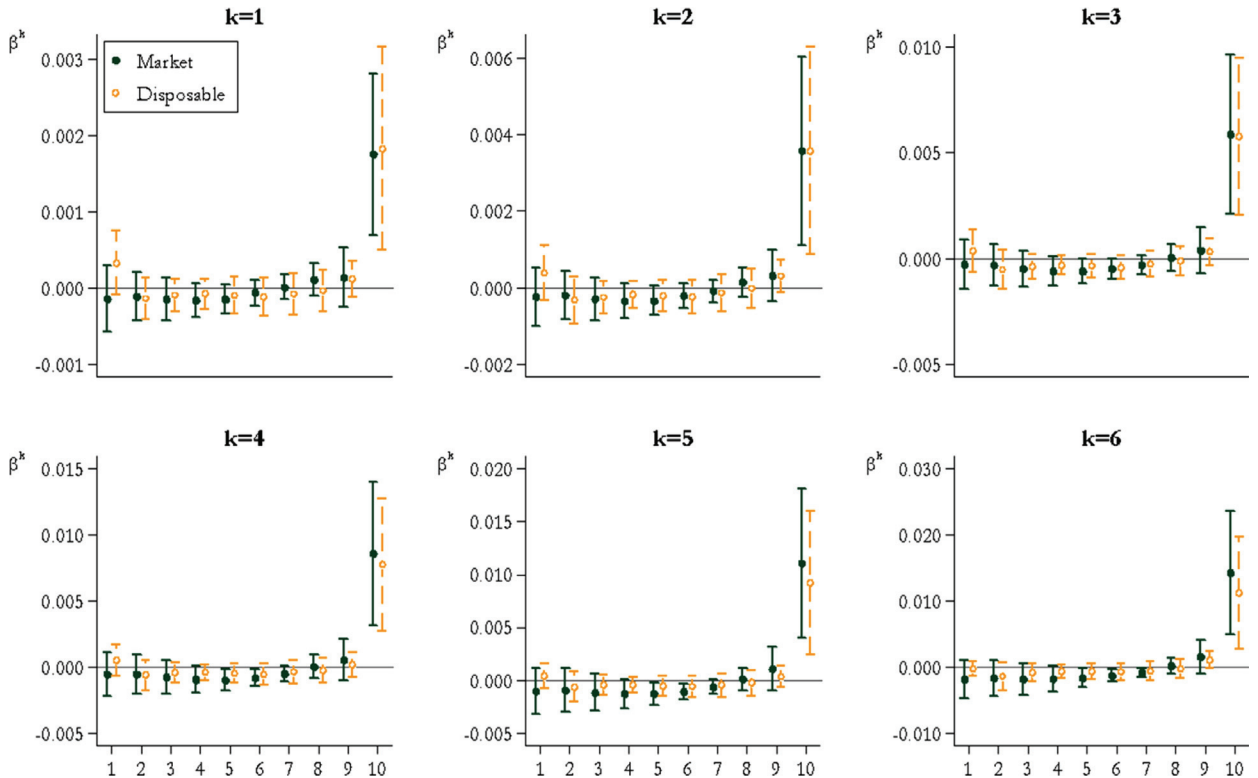
Note: Based on estimations of Equation (1) for OECD countries, with country-specific trends. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

Figure B.7. β^k, where Y = Gini



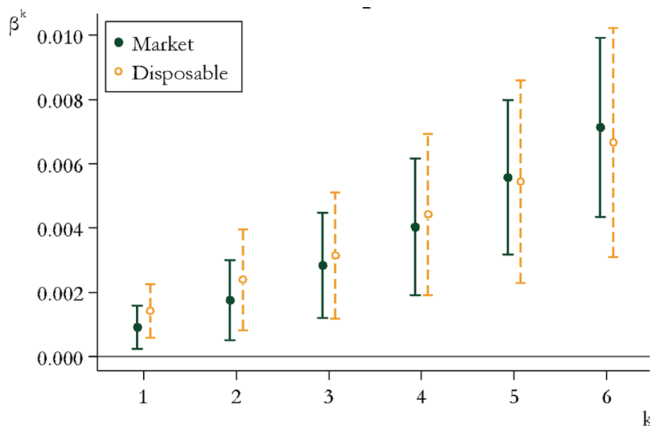
Note: The results are based on estimations of Equation (1) for OECD countries, with one lag. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

Figure B.8. β^k, where Y = Income Share by Deciles



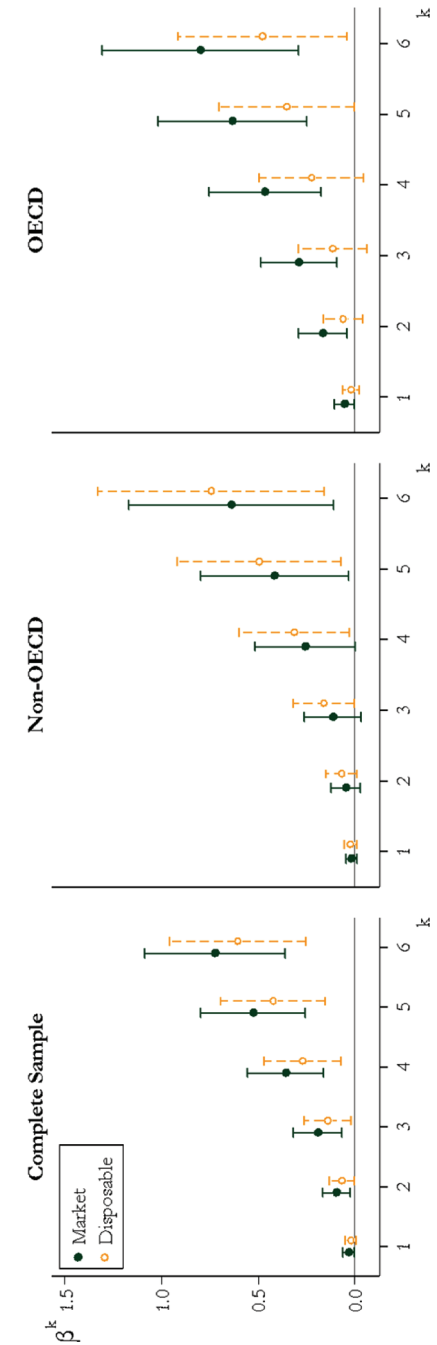
Note: The results are based on estimations of Equation (1) for OECD countries, with one lag. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

Figure B.9. β^k, where Y = Income Share of the Top 1 Percent



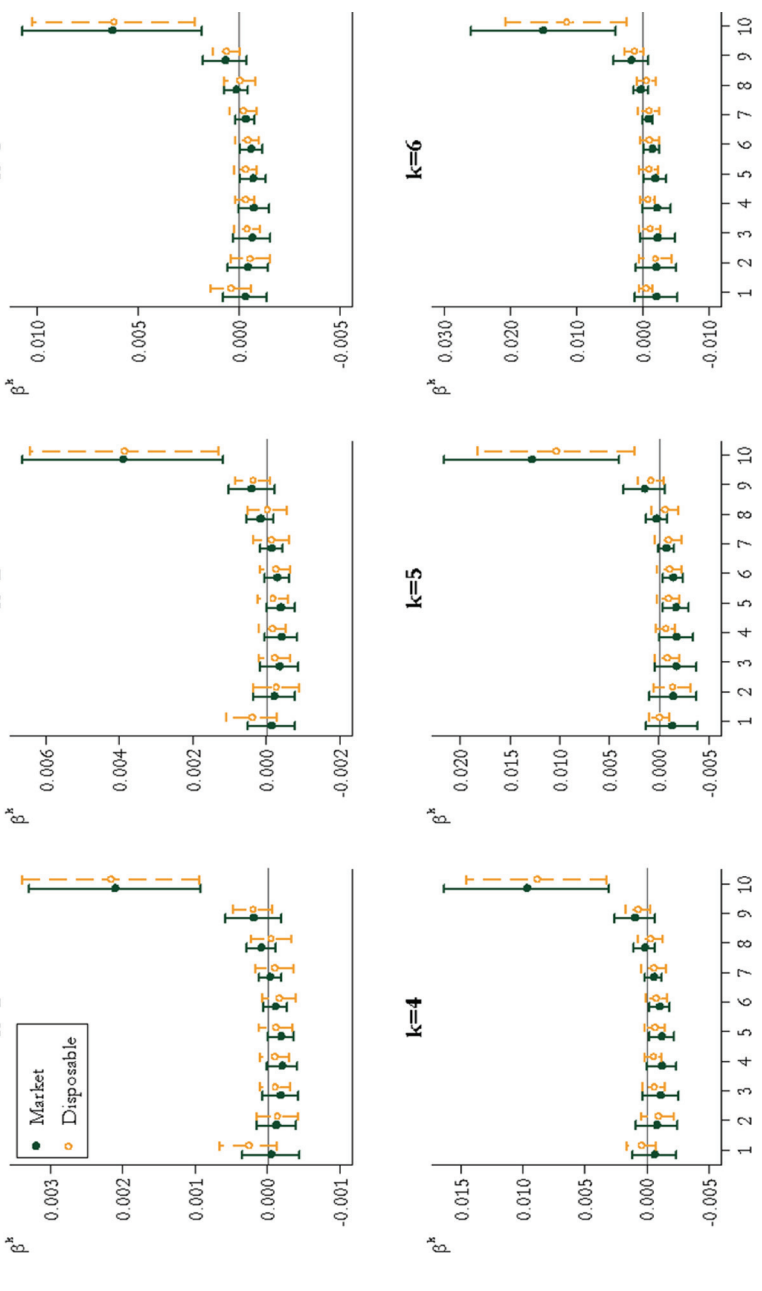
Note: The results are based on estimations of Equation (1) for OECD countries, with one lag. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

Figure B.10. β^k, where Y = Gini



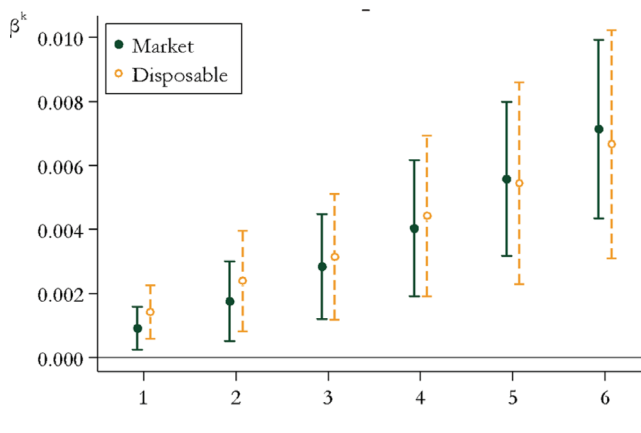
Note: The results are based on estimations of Equation (1) for OECD countries, with three lags. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

Figure B.11. β^k, where Y = Income Shares by Deciles



Note: The results are based on estimations of Equation (1) for OECD countries, with three lags. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary periods.

Figure B.12. β^k, where Y = Income Share of the Top 1 Percent



Note: The results are based on estimations of Equation (1) for OECD countries, with three lags. The plots report β^k (vertical axes) for different k's along with 90 percent confidence intervals. The β^k represent the change in the income share of the top 1 percent, k periods apart during a disinflationary episode relative to the same change during non-disinflationary times.

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