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Abstract

Since the 1980s, income inequality has increased substantially in several countries. Yet the political logic that triggered rising inequality in some places but not in others remains poorly understood. This paper builds a theory that links central bank independence to these dynamics. It posits the existence of three mechanisms that tie central bank independence to inequality. First, central bank independence indirectly constrains fiscal policy and weakens a government's ability to engage in redistribution. Second, central bank independence incentivizes governments to deregulate financial markets, which generates a boom in asset values. These assets are predominantly in the hands of wealthier segments of the population. Third, to contain inflationary pressures, governments actively promote policies that weaken the bargaining power of workers. Together, these policies strengthen secular trends towards higher inequality according to standard indicators. Empirically, the analysis finds a strong relation between central bank independence and inequality, as well as support for each of the mechanisms. From a policy perspective, our findings contribute to knowledge on the undesirable side effects of central bank independence.

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Does Central Bank Independence Increase Inequality?*

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1 Introduction

Income inequality has been identified as a source of many social woes. It is believed to increase the risk of financial crises (Kumhof, Rancière, and Winant, 2015), reduce investments (Bardhan, 2005), and shrink growth (Persson and Tabellini, 1994; Alesina and Rodrik, 1994; Herzer and Vollmer, 2012).[1] Inequality also steepens the risks of social and political unrest (Ehrlich, 1973; Acemoglu and Robinson, 2000).[2] Observers generally agree that it has been increasing in many countries (Piketty, 2013; Piketty and Saez, 2014). The industrialized middle class, in particular, has seen its income stagnate (Rajan, 2010; Milanović, 2016). But these patterns are not universal and their dynamics remain poorly understood. They are inconsistent with canonical models, which predict declining inequality (Kuznets, 1955). More recent scholarship fits the data better but remains under-theorized and seldom explains persistent cross-country variation in inequality (Piketty, 2013).

In this paper, we sketch a political-economic theory that ties increasing levels of income inequality to the design of monetary institutions. We focus on central bank independence (CBI), a major institutional reform, and link it to a government's choice of policies that guide income distribution. Our argument can be summarized as follows. Governments like to use economic policies to increase their chances of staying in power. However, CBI weakens their ability to implement aggressive macroeconomic policies. Under an independent central bank, fiscal policy loses its sharpness and monetary policy is out of reach altogether. Governments must thus shift gears and focus on manipulating microeconomic policies. We focus on three mechanisms (financial, labor market, and social policies), each of which lead to increased inequality. First, CBI increases the temptation to liberalize financial markets and fuel private debt (Aklin and Kern, forthcoming). Liberalization primarily benefits asset owners, who tend to be wealthier in first place. Second, CBI increases the

[1] Some of these findings are controversial. See, *inter alia*, Li and Zou (1998), Aghion, Caroli, and Garcia-Penalosa (1999), Cingano (2014), and Milanovic and Van Der Weide (2014).

[2] The study of the links between inequality and social instability has a long tradition. Aristotle wrote "what share insolence and avarice have in creating revolutions, and how they work, is plain enough" (*Politics* V.3.). About 1800 years later, Machiavelli noted: "For such corruption and little inclination for a free society result from an inequality that exists in that City; and wanting to bring them to equality, it is necessary to use the most extraordinary means" and "Republics, therefore, can be established where a great equality exists or can be established, and, on the contrary, a Principality can be established where a great inequality exists; otherwise they will lack proportion and have little durability" (*Discourses Upon The First Ten Books of Titus Livy*, I.17 and I.55). This being said, the existence of a causal effect from inequality to social unrest has been contentious as well. For a discussion, see Lichbach (1989).

risk of rising unemployment because monetary policy is initially tighter (Franzese, 2001). To counteract this, governments may weaken labor market regulations. This contracts earnings, especially among the lower skilled and poorer workers. Third, CBI curtails the ability of governments to engage in welfare spending, which also increases disparities between the rich and the poor (Bodea and Higashijima, 2017).

In sum: a government that implements CBI finds itself nudged toward adopting policies that increase inequality. Note that in this model, inequality is a side effect of CBI and not a goal in itself. Note also that we are not claiming that CBI is causing inequality. Rather, we are postulating that CBI modifies policymakers' incentives to adopt compensating policies.

Empirically, we test these hypotheses using a panel dataset covering up to 121 countries from 1980 to 2013 (exact samples differ depending on data availability). We find evidence in support of our main conjecture – that CBI increases inequality. An increase of CBI by one standard deviation leads, ceteris paribus, to a decline in the share of income of all income groups up to the 6th decile. The share of income earned by the bottom decile declines by 0.3 percentage points. CBI, on the other hand, has a considerable positive effect on the income share of the 80%-90% and the top decile. The latter saw its share of income increase by more than 1 percentage point. CBI, in other words, shifted income from the bottom half of the population to the top earners. In several robustness tests, we rule out competing interpretations of our results. In particular, we show that the effect of CBI is not driven by government ideology.

Next, we explore the three mechanisms that link CBI to inequality: financial liberalization, labor market deregulation, and welfare state retrenchment. In terms of financial reforms, governments loosen financial regulations to fuel credit growth, despite a more conservative monetary policy stance. A one-standard deviation increase in CBI leads to a more than 6 percentage point drop in the M2 growth rate while the credit growth rate increases by almost the same magnitude. With respect to labor markets, governments are more likely to initiate and agree with labor unions and employers on a social pact and enhance the legal rights of part-time and contract workers, effectively paving the way for a moderation of wage growth rates. Finally, we detect alterations of social programs. According to our estimations, a one standard deviation increase in CBI is

associated with a 7 percentage points drop in net household transfers. We find a similar effect with respect to social security benefits payments.

In light of these findings, we regard an institutional reform such as CBI as a contributing factor to secular trends toward inequality. Broadly speaking, existing studies of the determinants of inequality cluster around two poles. First, micro-level research emphasizes the role played by human capital and technology (Becker and Chiswick, 1966; Heckman and Krueger, 2005; Goldin and Katz, 2009). Inequality increases and decreases depending on the relative demand for low- and high-skilled workers. A related line of inquiry focuses on other micro-level decisions such as households' saving rates, which tends to be higher among already high earners, making increasing inequality an endogenous process (Kuznets, 1955; Piketty, 2013; Zhang et al., 2018).

Second, researchers have conjectured that inequality may be affected by macro-level institutions and regulations. The importance of regulatory interference with income distributions was already noted by Kuznets (1955, 9) who emphasized the importance of "political" decisions. Political interventions include tax rates progressivity (ex ante) (Piketty and Saez, 2003; Scheve and Stasavage, 2010) and fiscal redistribution (ex post) (Scheve and Stasavage, 2009). Taking a step back, we ask: what drives these policies? They may be driven by individual preferences for or against redistribution (Meltzer and Richard, 1981; Ansell, 2014; Rueda and Stegmueller, 2016). These policy choices could also be affected by institutions and social cleavages (Kenworthy and Pontusson, 2005; Scheve and Stasavage, 2010).

This is where our contribution lies. We study how the design of monetary institutions shapes policymakers' behavior and thus impacts inequality (Coibion et al., 2012; Stiglitz, 2013; Colciago, Samarina, and de Haan, forthcoming; Sturm et al., 2020). This paper is closely linked to Sturm et al. (2020). Whereas Sturm et al. (2020) focus on the direct channels linking monetary institutions to inequality dynamics, our argument is embedded in a broader political economy context of economic policymaking. As such, our analysis complements recent debates on the role of monetary policy on inequality dynamics. On the one hand, popular debates attribute recent income inequality to excessively loose monetary policies. For instance, in the aftermath of the financial crisis in 2008, commentators have argued that unconventional monetary policy "*drove up asset prices and bailed*

out baby boomers at the profound political cost of pricing out millennials from that most divisive of asset markets, property."[3] On the other hand, many economists claim that monetary policy is neutral with respect to the distribution of income. Prominently, former Federal Reserve Chairman, Ben Bernanke, pointed out that "*monetary policy is neutral or nearly so in the longer term, meaning that it has limited long-term effects on real outcomes like the distribution of income and wealth.*"[4] Existing empirical evidence is at best mixed (Colciago, Samarina, and de Haan, forthcoming; Sturm et al., 2020). Here, we set aside discussions on the direct role played by monetary policy. Instead, we focus on the political consequences played by an institutional reform – central bank independence – that shapes governments' incentives and ability to intervene in several economic policy domains.

2 Micro and Macroeconomic Policies

Our analysis starts from the premise that governments are rewarded by supporters and voters when their personal welfare improves (e.g., Alesina, Roubini, and Cohen, 1997; Ansolabehere, Meredith, and Snowberg, 2014). Broadly speaking, there are two sets of tools a government can use to deliver such benefits. First, it can activate macroeconomic levers. It can do so by increasing public spending, reducing taxes, or cutting interest rates. These tools, however, have lost some of their edge over the past decades. The shift toward independent central banks weakened governments' ability to print money and favorably manipulate interest rates. In addition, CBI weakens the effectiveness of fiscal policy (Sims, 2016; Bodea and Higashijima, 2017). Under CBI, an overly expansive fiscal policy is likely to be met with a restrictive monetary policy, the two canceling each other.[5]

Governments' declining ability to conduct effective macroeconomic policies does not, however, preclude these from adopting *microeconomic* measures that can be politically just as beneficial. Specifically, governments can act in three areas. First, governments can nudge financial markets to facilitate access to credit. Access to cheap credit expands the ability of private agents to spend

[3] "Quantitative easing was the father of millennial socialism" *Financial Times*, March 1, 2019.

[4] "Monetary policy and inequality" *The Brookings Institution*, June 1, 2015.

[5] The effectiveness of fiscal policy at the macro level has been debated for other reasons as well, such as its effect on private spending (Barro, 1989). This debate is reviewed in Auerbach, Gale, and Harris (2010).

and therefore increases short-term consumption and long-term investments. Rajan (2010) argues that credit compensates for otherwise stagnating wages and generates political payoffs that are comparable to direct transfers by governments. To unleash credit, governments can use several tools. They can reduce oversight of financial markets, increase moral hazard through introducing blanket guarantees, or cap interest rates (Aklin and Kern, forthcoming). Take for instance, the case of Hungary in the early 2000s. After introducing CBI, the administration opened the country to international capital flows and expanded its extremely generous mortgage subsidy scheme.[6] These policies were not only effective to compensate for the curtailing effect of CBI, but so powerful that they built the backbone for a credit-fueled housing boom (IMF, 2012; Stiglitz, 2013; Bohle, 2014).

While these reforms offer short-term political payoffs, they adversely impact the distribution of economic gains. As result of excess financial deregulation to compensate for the loss of monetary policy, fast credit growth and subsequent asset price inflation benefit surplus savers. These savers tend to be already concentrated in the higher income and wealth brackets (Carney and Gale, 2001; Gittleman and Wolff, 2004).[7] We call this the *financial* channel.

Second, having lost control over monetary policy, governments cannot directly inflate real wages to stimulate employment. Thus, structural labor market reforms become more important. Their aim consists of removing downward wage rigidities and structural impediments to reach full employment (Franzese, 2001; Rueda, 2007; Thelen, 2014). Put differently, governments deregulate labor markets to avoid an uptick in unemployment after CBI. For instance, in the case of Colombia in the early 1990s, the Gaviria administration loosened labor market regulations alongside implementing CBI. In particular, the administration concentrated on reducing "*the costs of dismissing workers and widened the hiring modalities available for employers*"(Echeverry and Santa Maria, 2004, 7). Similar patterns have been observed in several European countries entering the European Mone-

[6]Besides introducing personal tax exemptions for mortgage down-payments (approximately 40% of the loan repayment could be deducted from the tax base), the government reduced the effective interest rate on subsidized mortgages to 6% (Dobricza, 2004; Rózsavölgyi and Kovács, 2005). Inflation standing at 10% meant that households could borrow at an effective interest rate of minus 4%, leading to an unseen jump in mortgage lending of more than 50% by the end of 2001 (IMF, 2002).

[7]The sources of income are generally wage earnings, rents, profit shares, and interest earnings. As interest income, rents, and profit shares constitute an important source of income for firm owners, high income earners, retirees, and households with substantial asset holdings (Coibion et al., 2012), we refer to this broad definition of income and income inequality.

tary Union (Siebert, 1997; Calmfors, 2001; Bertola, 2016). These labor reforms were seen necessary to promote wage flexibility to minimize negative employment effects from giving up the ability to absorb adverse shocks through monetary policy intervention in the Eurozone (Hassel, 2006).

At the same time, dismantling protective labor market institutions produces all sorts of adverse effects on workers and leads to an erosion of workers' bargaining power that builds the backbone for wage dispersion and stagnation, ultimately fueling rising levels of income inequality (Hall and Soskice, 2001; Hassel, 2006; Jaumotte and Osorio, 2015). This is the *labor market* channel.

Third, governments can implement social policies that benefit key constituencies (Allan and Scruggs, 2004; Immervoll and Richardson, 2011). As CBI often implies cutting the tight cord between fiscal and monetary policy, governments' ability to tap into central bank funds for redistributive purposes is constrained (Bodea and Higashijima, 2017). Central banks have often been operating as quasi-fiscal agents disbursing subsidized loans to the poor. Likewise, policy makers have often turned to their central banks to fund fiscal outlays and thus indirectly supported redistributive policies (Goodhart, 2011). For example, in several Latin American countries, central banks have operated credit subsidy schemes for small-scale farmers and provided generous funding windows to state-owned banks and their governments to fund social programs (Carstens and Jácome, 2005; Carrière-Swallow et al., 2016). From a monetary policy perspective, social policy can put a stop gap on downward wage adjustments and thus introduce frictions into the labor market (Thelen, 2014). For example, New Zealand, after granting CBI in 1990, implemented social spending cuts to reduce fiscal deficits and to remove downward wage rigidities from the labor market (Evans et al., 1996). Similarly, in the case of the European Monetary Union, social spending cuts – in response to joining the euro – have been identified as a key driver for rising inequality in Eurozone countries (Bertola, 2010). Taken together, CBI often constrains the ability of governments to implement redistributive policies, ultimately hurting the low-income segment of society. We refer to this as the *social policy* channel.

Synthesizing these insights, we hypothesize that CBI leads to enhanced income inequality. Furthermore, we believe that it operates through three channels: financial deregulation (which helps wealthier asset owners), labor market deregulation (which limits unemployment but compresses

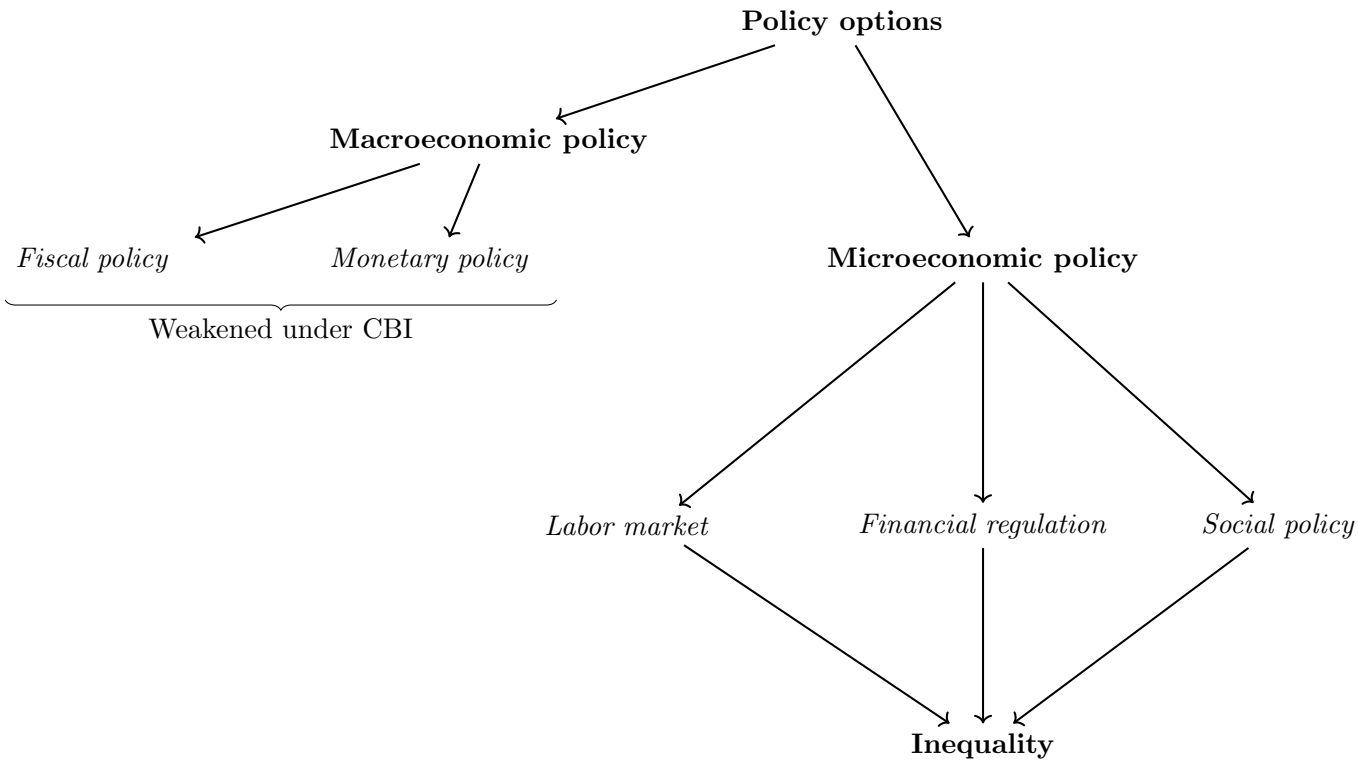

Figure 1: Stylized economic policy options.

wages), and social policy retrenchment (which comes from the constraints on government spending). Our argument is summarized in Figure 1.

We believe that there are several interactions between each policy field that lead to an amplification of our results. As we cannot directly test these additional mechanisms, we discuss the most relevant interactions here.

First, it is well established that enhanced financialization of the economy leads to a shift in bargaining power of firms over workers (Freeman, 2010; Piketty, 2013; Maxfield, Winecoff, and Young, 2017). This erosion in bargaining power often translates into stagnating wages and translates into increasing profits for firms. Whereas capital owners are the main beneficiaries of wage stagnation, there exists a second round effect. When workers want to maintain consumption levels but cannot increase their wages, they will access credit markets to fill in for these wage shortfalls. Subsequently, a vicious circle of increasing firm profits, wage stagnation, and credit growth emerges. As result, low-income earners are left with stagnating incomes whereas firms and the financial industry

pocket the profits (Van der Zwan, 2014). Thus, even though wage stagnation builds the backbone for low inflation rates and thus monetary stability (Hassel, 2006), it leaves lower income individuals at disadvantage, leading to rising inequality.

Second, there exists a strong relationship between credit markets and welfare policy. In fact, in several country cases, redistributive policies have increasingly been outsourced into financial markets (Crouch, 2009; Bohle, 2014; Ahlquist and Ansell, 2017). A prominent example of such a mechanism have been mortgage subsidies that allow households easier access to mortgages. As many of these programs come at a fraction of costs that would arise from new public housing construction (Hoek-Smit, 2008; Doling and Ronald, 2010; Bohle, 2014), they have become popular instruments to garner political support without incurring rising public debt levels.[8]

Finally, from a political perspective, shifting gears towards an asset-based welfare system might produce perverse effects and lead to further rounds of welfare state retrenchment. For example, Barth, Finseraas, and Moene (2015) show for a selected number of OECD countries how inequality leads to a shift of party politics towards more welfare cuts. Similarly, Ansell (2014) analyzes survey data from the United Kingdom and the United States and finds that homeowners are less likely to vote in favor redistributive policies as they can 'self-insure' against adverse economic shocks such as unemployment. Furthermore, enhancing private contributions into pension funds — which have been commonly used to relieve government-run pension funds from financial pressures — might further strengthen individuals' leaning towards welfare and regulatory policies (Barth, Finseraas, and Moene, 2015; Alt and Iversen, 2017; Pagliari, Phillips, and Young, forthcoming). Pagliari, Phillips, and Young (forthcoming) show for US survey data that individuals with larger asset positions are more likely to be in favor of looser financial regulations. Taken together, we expect that these reinforcing mechanisms lead to an amplification of the initial effect of CBI on income inequality dynamics.

[8] In many instances, governments use credit guarantee schemes or deploy only a small subsidy on loans. In the case of a guarantee, these do not have to be included at face value of the loan in budgetary balances, effectively masking a government's real financial exposure (Hoek-Smit, 2008; Bachmair, 2016).

3 Research Design

We explore the effects of CBI using cross-national panel data. We test both the overall prediction (CBI increasing inequality) as well as each of the mechanisms (the effect of CBI on financial regulations, labor market, and social policies). None of these variables has a natural and unique proxy. This forces us to rely on several variables that capture the underlying theoretical quantities of interest. We present them briefly here. All variables are summarized in Table 1.

Summary statistics

	Mean	Median	S.D.	Min.	Max	Obs.
CBI	0.50		0.20	0	1	4369
GDP (log)	23.68		2.38	17	31	9070
Population (log)	15.00		2.30	8	21	11937
Income share of bottom 10%	2.35		1.07	0	5	1000
Income share of 10-20%	3.94		1.31	1	7	1001
Income share of 20-30%	5.04		1.35	2	7	1001
Income share of 30-40%	6.06		1.32	3	8	1001
Income share of 40-50%	7.12		1.25	4	9	1001
Income share of 50-60%	8.34		1.13	5	10	1001
Income share of 60-70%	9.84		0.93	7	12	1001
Income share of 70-80%	11.91		0.64	9	14	1001
Income share of 80-90%	15.39		0.91	13	18	1001
Income share of top 10%	30.02		7.93	18	52	1001
Financial Reform Index	10.36		6.34	0	21	2638
Bank Liberalization	1.26		1.19	0	3	2638
Social pact	0.24		0.47	0	5	1637
Labor law	41.85		18.98	6	94	2335
Social reform	0.05		0.22	0	1	1586
Pension reform	0.02		0.13	0	1	1585
Money and quasi money growth (%)	35.26		272.63	-100	12513	6223
Private credit (log)	22.71		2.80	10	31	7094
Price level of capital stock	0.50		0.35	0	4	7436
Inflation (%)	31.90		396.14	-18	23773	5914
Incidence of Part-Time Employment	14.07		6.98	2	39	908
SSA benefits (log)	2.47		0.48	0	3	988

Table 1: Summary statistics.

Our central independent variable is CBI. We use a recently updated version of the CBI measure as proposed in Bodea and Hicks (2015*b*). Following the coding protocol of Cukierman, Miller, and Neyapti (2002), the index is built around four dimensions of CBI (e.g., the mandate of a central bank, monetary financing prohibitions) that are normalized on a scale between 0 and 1. Higher scores of the index indicate a greater degree of CBI. The data available from Bodea and Hicks (2015*b*) covers up to 144 countries between 1972 and 2014 and are one of the most comprehensive

datasets available to measure CBI. For robustness, we also use the data collected by Garriga (2016), which yields similar results.

To capture inequality dynamics, we rely on data from the World Bank's PovcalNet database. Besides providing an extensive coverage of countries over a comparably long timespan, a key advantage of this dataset is that includes information on income dynamics at the decile level, which allows us to study income dynamics in a more fine-grained manner. Our headline results rely on the share of total income earned by each decile, ordered from the lowest- (bottom 10%) to the highest-earners (top 10%). Our conjecture is that the latter should benefit from CBI, whereas the former should be hurt. Together, this would indicate an increase in inequality.

In addition, we test the validity of the channels through which CBI operates. We discuss these variables in Section 5. Suffice here to say that we examine a range of variables that capture financial, labor market, and social policy deregulation (outputs). In addition, we also investigate the effect of CBI on a range of financial and other economic indicators (outcomes) that should be affected if our argument is correct.

Our baseline models are parsimonious by design. We are wary of including post-treatment control variables that would bias our results (Angrist and Pischke, 2008; Montgomery, Nyhan, and Torres, 2016). Likewise, we are concerned by estimates that depend on complicated modeling strategy (Leamer, 1983). Therefore, we prefer a simple model that uses within-country variation and eliminates time shocks. In the models below, we also control for GDP and population (both logged) to account for differences in baseline economic wealth and size. In the appendix, we include several models with a fuller set of adjustments for potential confounders (see Section 4.2 for a summary). This allows us to rule out competing interpretations of our findings, such as the role played by government ideology.[9]

Our main model takes the following form:

$$\text{Outcome}_{it+1} = \beta \text{CBI}_{it} + \mathbf{X}_{it}\gamma + \alpha_i + \tau_t + \varepsilon_{it}, \tag{1}$$

where countries are indexed by i, years by t (α and τ representing country and year fixed effects,

[9] Adjusting for the ideology of the government does not affect the estimates in meaningful ways (Table A12).

respectively). The error term ε is a random shock. Standard errors are clustered by country.

4 Results: Inequality

4.1 Overview of Results

Our fist set of results are reported in Table 2. The dependent variable ranges from the poorest segments of the population (model 1, which models the income share of the bottom 10% of the population) to the wealthiest (model 10, which models the top 10%).

Explaining changes in income shares

	(1) 0-10	(2) 10-20	(3) 20-30	(4) 30-40	(5) 40-50	(6) 50-60	(7) 60-70	(8) 70-80	(9) 80-90	(10) 90-100
CBI	-0.75**	-0.71**	-0.56**	-0.47**	-0.36	-0.24	-0.11	0.06	0.42	2.72*
	(0.28)	(0.27)	(0.26)	(0.24)	(0.23)	(0.22)	(0.20)	(0.20)	(0.33)	(1.36)
GDP (log)	0.32	0.46	0.35	0.26	0.23	0.28	0.38	0.47	0.38	-3.12
	(0.33)	(0.31)	(0.34)	(0.37)	(0.39)	(0.39)	(0.36)	(0.32)	(0.38)	(2.26)
Population (log)	0.66	0.45	0.35	0.30	0.28	0.24	0.01	-0.25	-0.30	-1.74
	(0.56)	(0.50)	(0.50)	(0.49)	(0.49)	(0.50)	(0.51)	(0.56)	(0.76)	(2.91)
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	726	726	726	726	726	726	726	726	726	726
R^2	0.27	0.31	0.29	0.27	0.24	0.23	0.21	0.15	0.09	0.28
Mean of DV	2.30	3.87	4.96	5.97	7.04	8.26	9.78	11.89	15.44	30.48
SD of DV	1.06	1.32	1.36	1.33	1.26	1.14	0.94	0.64	0.89	8.01

Table 2: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

We find suggestive evidence that the poorest were negatively affected by CBI. The effect was worst for the bottom 10%, but it was negative and statistically significant for the entire bottom 60% of the population. The effect was about nil for the 60-70% and 70-80% brackets. The top-20% saw their share of income increase (and the top-10% even more so). We note here the importance of the year fixed effects, which take into account secular trends toward higher inequality.

To show how remarkably monotonic this effect is, we report the effect of a one-standard deviation increase in CBI (about 0.2 points) for each income group in Figure 2. To situate the magnitude of the effect, the within-country standard deviation of income in the bottom bracket is about 0.3.

Thus, the effect of a one-standard deviation increase in CBI corresponds to a decline of income by about 0.3 percentage point, or about one standard deviation. On the opposite side of the income spectrum, an increase in CBI by one standard deviation leads to an increase in the share of income by a bit more than 1 percentage point, which represents slightly more than half a standard deviation. Overall, the effect is therefore large comparable to what countries typically experience.

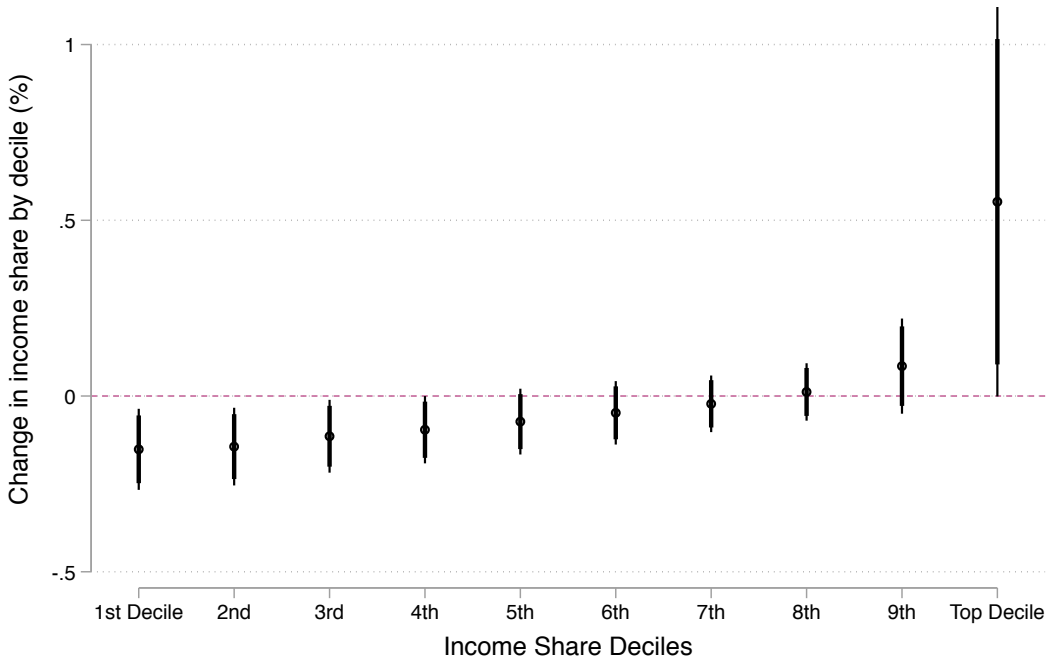

Figure 2: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. The marginal effect represents a change of CBI by one standard deviation (about 0.2 units). Standard errors clustered by country.

4.2 Robustness Tests

We subject these findings to a series of robustness tests and report the results in the supplementary appendix. Since our identification relies on model specification, we examine whether our main results are affected by adjusting for various potential confounders.

First, we examine whether our results remain stable when adjusting for additional economic

shocks that may be correlated with CBI. We augment our baseline model with variables capturing trade openness, technological progress, and financial crises. For instance, it is well documented that countries opening to international trade are more susceptible to experience a widening of income gaps, as the gains of enhanced trade are distributed unevenly (Stiglitz, 2012; Helpman et al., 2017; Rodrik, 2018). To account for this effect, we include the percentage of trade over GDP. Furthermore, to capture the effect of technological progress, we include the TFP growth rate on the right hand side (Feenstra, Inklaar, and Timmer, 2015). Similar to a liberalization of international trade relations, rents arising from technological progress tend to be unevenly distributed and benefit higher income groups in society (Milanović, 2016). Lastly, there exists evidence supporting the notion that CBI is implemented around financial crisis and that these episodes of financial distress affect low-income individuals more severely (Bodea, Houle, and Kim, 2019). As Table A1 shows, our main results tend to be stronger when these variables are accounted for.

Second, we adjust for other political factors: regime types, IMF interventions, the strength of financial special interests, and government ideology. First, democracies tend to have less inequality (Muller, 1988; Reuveny and Li, 2003) while facing different incentives to grant independence to their central banks (Bodea and Hicks, 2015*b*). Second, the IMF often prescribes CB reforms towards greater CBI when providing loans to countries (Kern, Reinsberg, and Rau-Göhring, 2019). These conditions are often embedded in country lending programs that require governments to implement fiscal austerity measures alongside structural reforms that are associated with an upshot in income inequality (Forster et al., 2019). To mitigate these concerns, we include a variable capturing the presence of an IMF program in a given year. Third, we include a variable capturing financial sector strength, which might drive CBI and inequality simultaneously. To capture financial sector strength, we follow the procedure proposed in Pepinsky (2013).

The results, reported in Table A2, remain virtually identical. Furthermore, combining both economic and political confounders does not change our results (Table A3).

We next verify that our results are not driven by government ideology. Our analysis, so far, is consistent with the following alternative interpretation: CBI and inequality are being simultaneously driven by a shift in government ideology (possibly in the aftermath of the Thatcher-Reagan

governments). To rule out this hypothesis, we adjust our estimates for the ideology of the government (Table A12). Our main results are about the same (both in magnitude and in statistical significance).

These augmented models cannot entirely rule out endogeneity concerns. To mitigate concerns about reverse causality and third variables bias, we follow the CBI literature to address these concerns (Jácome and Vázquez, 2008; Bodea and Hicks, 2015*a*; Garriga and Rodriguez, 2019).

First, following Bodea and Hicks (2015*b*), we verify that removing observations for the two years prior to CBI reform or the following two years does not affect our estimates (Table A4 and A5). Likewise, our results remain qualitatively similar when including a dummy variable that captures whether a government has implemented CBI reform in the past 5 years (Table A6).[10]

Second, we implement two separate instrumental variables approaches. Following Jácome and Vázquez (2008) and Bodea and Hicks (2015*a*), we use the lagged values of the CBI Index. The first stage F-value is well above the conventional level of 10. Our results remain virtually identical when compared to baseline (Table A7). Acknowledging the limitation of this approach, we construct another instrument from the interaction of the lagged value of CBI and the average CBI level in neighboring countries. The rational is that CBI displays a regional diffusion pattern (McNamara, 2002; Polillo and Guillén, 2005; Garriga and Rodriguez, 2019), which should not necessarily impact domestic inequality. However, policy change often follows a regional pattern which is important in our context (e.g., Simmons and Elkins, 2004).[11] To account for potentially competing effects, we form a compound instrument and interact this variable with the lagged value of CBI (e.g., Nunn and Qian, 2014). We report the results in Table A8. Our results remain very similar in comparison to our baseline estimations.

Finally, we verify that our empirical results hold when using a dynamic general methods of moments (GMM) estimator. Besides helping us to mitigate concerns about endogeneity, using a GMM model allows to eliminate the effect of short-term economic fluctuations and thus to account for long-run or general equilibrium effects of our proposed relationship (Garriga and Rodriguez,

[10]For a similar approach, see Bodea and Hicks (2018).

[11]To verify that our findings do not follow a regional diffusion pattern, we re-estimate our baseline model using Discroll-Kraay standard errors (Driscoll and Kraay, 1998). This does not impact our results, which we report in Table A9.

2019). As income decile shares do not follow a random path but tend to be persistent over time, we opt for a first difference GMM estimator (Roodman, 2009). This class of models has been applied to small T/large N settings. For this reason, we collapse our data and form five-year time windows. In line with expectations concerning the central features of this model class (Wu, Luca, and Jeon, 2011), our point estimates become stronger in comparison to baseline (Table A10).[12] Overall, our results withstand a series of robustness checks giving us more confidence in the viability of our proposed mechanism.

5 Results: Mechanisms

In this section, we present the results of the main mechanisms through which CBI is driving inequality. We start with an in-depth analysis of the policy changes and then present the results for anticipated economic outcomes.

5.1 Three Mechanisms

First, a powerful way to compensate for the loss in monetary policymaking is to deregulate financial markets (Aklin and Kern, forthcoming). To capture such instances of financial deregulation, we rely on two indicators. Besides taking an aggregate financial liberalization index that ranges from 0 to 21, whereby higher values indicate less stringent regulatory practices, we complement our analysis using a measure for the degree of privatization of the banking industry. Whereas our aggregate measure captures the overall 'aggressiveness' of financial reform, our measure for the extent of the banking industry's privatization proxies the degree to which policymakers remove barriers to competition among banks to stimulate financial activity and credit (La Porta, Lopez-de Silanes, and Shleifer, 2002; Epstein, 2016). The data come from Abiad, Detragiache, and Tressel (2010).

Second, we perform an analysis of whether CBI leads to changes in the governance of labor relations. For one, CBI constrains governments' ability to inflate wages for restoring full employment (Thelen, 2014). Furthermore, wage inflation dynamics can threaten the effectiveness of monetary

[12] Even when considering different modifications within this class of models, our results remain quantitatively and qualitatively similar (Table A11).

policy, leading to excess unemployment. An often applied policy response to these challenges is to remove labor market frictions that prevent a smooth adjustment (in terms of a downward correction of wages). Given that labor reforms are extremely unpopular (Reinsberg et al., 2019), policymakers often opted for social pacts that entailed clauses on wage restraint and piece-meal labor reform provisions (Hassel, 2006). To capture this effect, we verify that CBI increases the likelihood that a country implements a social pact. The data come from Visser (2015). In terms of partial labor market reform, governments often targeted specific legal aspects governing labor relations (Hassel, 2006). For example, in the case of the Republic of Korea, initiating CBI reform in late 1997, the Korean government loosened firing provisions for firms and boosted the legal statutes of part-time and contract workers. At the same time, it left other labor regulations untouched (Pirie, 2007). Whereas these reforms render labor markets more flexible and lead to lower labor costs for firms, more flexible work arrangements often enhance the share of precarious forms of employment and erode workers' bargaining power (Jaumotte and Osorio, 2015; Johnston and Regan, 2016). We complement this analysis using a composite indicator capturing the restrictiveness labor regulations towards part-time and contract workers. The data come from Reinsberg et al. (2019).

Finally, we are concerned with analyzing how CBI impacts social policymaking. Given that CBI tightens the room for fiscal maneuvering and requires to remove downward rigidities in wages (that emerge from generous social transfers), governments have often tampered with social policy reform to accommodate CBI. For example, in the case of Germany, generous social benefits were believed to hinder necessary wage adjustment to equilibrate the labor market, triggering the so-called Hartz Reforms in the early 2000s (Manger and Sattler, 2019). Social and welfare state reforms are often embedded in social pacts or social contracts, which include clauses that relate to pension, health, and social benefit reform (Hassel, 2003; Rhodes, 2005). To verify that CBI leads to shifts in social policymaking, we use two indicators. Besides using information on whether a social pact entails clauses concerning social and/or welfare policy shifts, we analyze whether social pacts include clauses concerning pensions. Pension reform policies that incentivize investments in financial assets instead of making direct contributions to the public pension system have often been used to reduce overhead costs on wages, lighten the fiscal burden and bolster bond market

development to enhance the absorptive capacity of financial markets (Ebbinghaus, 2015). We draw on the information available from Visser (2015).

5.2 Results

We present the results of these regressions in Table 3.

Explaining inequality-increasing policies

	Financial Reform		Bank. Entry Barriers		Social Pact		PT Index		Social Reform		Pension Reform	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CBI	2.92**	2.14*	1.05***	0.99***	0.27*	0.31*	20.01***	20.24***	0.09*	0.08	0.07**	0.06**
	(1.18)	(1.14)	(0.35)	(0.36)	(0.15)	(0.17)	(6.74)	(7.06)	(0.05)	(0.07)	(0.03)	(0.03)
GDP (log)	-0.11	-0.01	-0.59***	-0.60***	-0.12	-0.15	0.30	0.04	0.05	0.05	0.03	0.04**
	(0.85)	(0.88)	(0.21)	(0.21)	(0.18)	(0.17)	(2.91)	(2.99)	(0.07)	(0.08)	(0.03)	(0.02)
Population (log)	0.55	-0.49	0.90*	0.86*	-0.16	-0.13	-22.50**	-22.67**	-0.20***	-0.21***	-0.04	-0.08*
	(1.77)	(1.81)	(0.49)	(0.51)	(0.25)	(0.25)	(9.32)	(9.30)	(0.07)	(0.07)	(0.04)	(0.04)
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE		✓		✓		✓		✓		✓		✓
Quadratic Time	✓		✓		✓		✓		✓		✓	
Observations	2176	2176	2176	2176	1230	1230	1723	1723	1198	1198	1197	1197
R^2	0.80	0.82	0.34	0.35	0.01	0.04	0.28	0.29	0.02	0.05	0.01	0.06
Mean of DV	11.21		1.34		0.25		41.40		0.05		0.02	
SD of DV	6.21		1.19		0.48		19.28		0.22		0.15	

Table 3: The dependent variable is listed at the top of the models. *Financial Reform* is an index (from 0 to 21) where higher values denote higher levels of financial liberalization. *Bank. Entry Barriers* is an index (from 0 to 5) where higher values denote that banking entry barriers are laxer. *Social Pact* is a variable that ranges from 0 (no social pact or agreement in a given year) to 5, which would indicate that a country-year has more than three social pacts or agreements. PT is an index (from 0 to 100) variable whereby higher values of the index have less stringent regulations concerning part-time and contractual workers. *Social Reform* is an indicator ($\{0,1\}$) where 1 means that a country-year has a social pact that entails clauses on social policy reform. *Pension Reform* is a binary variable $\{0,1\}$ where 1 indicates that a a country-year has a social pact that entails clauses on pension reform. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

We find evidence for all three channels. In terms of financial market deregulation, governments tend to implement more comprehensive reforms that fuel competition and subsequently financial activity. For instance, a one-standard deviation increase in CBI is associated with a one point increase in the financial reform index. In comparison, Abiad, Detragiache, and Tressel (2010) code a three point increase in the financial liberalization index as a large-scale financial reform. Similarly, we find that governments are more likely to initiate and agree with labor unions and employers on a social pact. Similarly, governments tend to enhance the legal rights of part-time and contract

workers, effectively making way for less organized forms of employment. Finally, we can detect similar effects with respect to welfare and pension reform provisions that are included in these social pacts.

In our view, these results support the notion that governments deploy tailored policy reforms with the aim to minimize the downside effects of CBI. However, even in light of these policy changes, it is unclear whether these changes leave a mark on economic outcomes. To verify that this is the case, we analyze central macroeconomic (and financial) responses to CBI.

First, we analyze the movement of central financial variables. Financial deregulation opens the doors for greater leverage in the financial system (Adrian and Shin, 2008). When financial players are able to leverage up their balance sheets, they effectively create money. This implies that financial deregulation leads to a loosening of the connection between monetary policy and financial market outcomes (i.e., monetary decoupling). To capture this effect, we take the annual M2 growth rate, for which we expect it to fall at higher levels of CBI. The data come from Eichengreen and Rose (2014). The reason is that an independent central banker who is concerned with maintaining a stable inflation rate will not bend to a government's will to fuel economic activity through excess money creation. For example, one of the first steps – when announcing CBI in the United Kingdom in May 1997 – was to tighten monetary policy by increasing interest rates by 25 basis points (Corry, 2010). To offset this tightening effect, policymakers can substitute central bank money creation through excessively loosening regulatory practices fueling credit growth and financial activity that translates into rising asset prices (Aklin and Kern, forthcoming). This asset price inflation, in turn, feeds the pockets of a society's top-income segment (Piketty and Saez, 2014; Milanović, 2016). To capture credit growth dynamics, we calculate the annual credit growth rate from the World Bank (2019). Given the challenging nature of measuring asset prices, we use the price of the capital stock that is available from Feenstra, Inklaar, and Timmer (2015). A distinct advantage of using this comparably wide measure is that it "*is computed by aggregating asset-specific investment prices using shares of each asset in the total (current cost) capital stock*" (Feenstra, Inklaar, and Timmer, 2015, 3172), instead of capturing only a country's stock market performance in a given year.[13]

[13]This aspect is particularly important for the case of emerging market economies with a less developed financial infrastructure (e.g., bond or stock markets) where investors either directly channel funds into the real estate, the

Second, we analyze the response of selected labor market variables to CBI. If policymakers loosen regulations concerning contract and part-time work, we expect an increase in the incidence of part-time workers. For example, in the case of Korea, rising inequality has been attributed to an upshot in part-time and contractual work arrangements in the aftermath of CBI (Pirie, 2007). To capture this effect, we take the incidence of part-time workers from the OECD Database (Teorell et al., 2018). In addition to an increase in more flexible work arrangements, we expect that a 'flexibilization' of labor markets and wage restraint agreements in social pacts lead to wage moderation (i.e., lower real wage growth). To capture wage moderation and to mimic wage dynamics, we use an aggregate inflation measure. The data come from (Teorell et al., 2018). The reason for using a rather wide measure for wage dynamics is that wages constitute an important component of inflation dynamics (Rudd and Whelan, 2007; Peneva and Rudd, 2017; Bobeica, Ciccarelli, and Vansteenkiste, 2019). For instance, Bobeica, Ciccarelli, and Vansteenkiste (2019, 1) analyzing four countries in the Eurozone find "*there is a clear link between labor cost and price inflation.*" Thus, we expect lower inflation to be strongly associated with wage moderation.

Finally, we verify that the constraining effect of CBI on fiscal policy leads to a moderation of welfare expenditures. Take for instance the case of New Zealand. Shortly after implementing CBI in 1990, "*most social benefit rates were reduced by approximately 9 percent*" (Evans et al., 1996, 1878). To capture changes in social policy outcomes, we rely on two measures. Besides analyzing changes in net household transfers, we study the response of social security benefit payments to CBI. For data, we rely on Berg et al. (2018).

domestic banking sector or directly invest into firms (Menaldo, 2015). Thus, taking this wider measure allows us to capture these effects more precisely.

Explaining inequality-increasing outcomes

	M2 Growth (%)		Credit Growth (%)		Asset Prices		Inflation		PT Employment		SSA Benefits		HH Transfers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
CBI	-14.30**	-13.17*	0.15**	0.13**	0.08	0.19*	-6.15***	-4.29*	3.85**	4.95***	-0.17**	-0.13*	-0.20***	-0.17***
	(6.91)	(6.90)	(0.07)	(0.07)	(0.09)	(0.10)	(2.24)	(2.27)	(1.57)	(1.60)	(0.07)	(0.07)	(0.05)	(0.05)
GDP (log)	-2.95	-4.11	0.10***	0.10***	0.09	0.07	-2.37*	-3.41***	1.80	2.33	-0.04	0.02	-0.09	-0.04
	(2.98)	(2.97)	(0.03)	(0.03)	(0.11)	(0.11)	(1.30)	(1.28)	(3.47)	(3.90)	(0.20)	(0.19)	(0.26)	(0.25)
Population (log)	8.65**	10.02***	-0.08**	-0.08**	-0.63***	-0.60***	8.38***	9.28***	-0.60	-0.99	0.08	-0.01	0.12	0.05
	(3.76)	(3.74)	(0.04)	(0.04)	(0.17)	(0.17)	(2.44)	(2.48)	(6.02)	(6.35)	(0.24)	(0.24)	(0.22)	(0.22)
Year FE		✓		✓		✓		✓		✓		✓		✓
Quadratic Time	✓		✓		✓		✓		✓		✓		✓	
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	3550	3550	3564	3564	3861	3861	3348	3348	820	820	869	869	842	842
R^2	0.08	0.11	0.02	0.04	0.21	0.25	0.18	0.28	0.37	0.40	0.37	0.44	0.45	0.51
Mean of DV	19.48		0.06		0.53		8.72		13.96		2.54		2.90	
SD of DV	19.31		0.25		0.30		8.48		6.93		0.45		0.28	

Table 4: The dependent variable is listed at the top of the models. *M2 Growth (%)* captures the annual M2 growth rate. *Credit Growth (%)* captures the annual growth rate of private credit. *Asset Prices* are measured as the price level of the capital stock as proposed in Feenstra, Inklaar, and Timmer (2015). *Inflation* is the inflation rate. *PT Employment* captures the incidence of part-time employment, which is the proportion of persons employed part-time among all employed persons. *SSA Benefits* capture the natural logarithm of benefits paid by general government as a per cent of GDP. *HH Transfers* indicates the natural logarithm of current transfers received by households as percent of GDP. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Again, our results are strikingly supportive for our main theoretical claims. Interestingly, we can detect a decoupling of financial market activity from monetary policy. Whereas CBI has a dampening effect on the M2 growth rate, we can detect an uptick in credit growth and asset prices. For example, a one-standard deviation increase in CBI leads to a more than 6 percentage point drop in the M2 growth rate, whereby the credit growth rate increases by almost the same magnitude. As expected, we can detect a significant increase in asset prices whereas aggregate inflation drops. Our results also indicate that the incidence of part-time employment increases. The results concerning social spending are striking. A one standard deviation increase in CBI is associated with a 7 percent drop in net household transfers. We can detect a similar effect with respect to social security benefits payments. Synthesizing these findings, we posit that the policy responses to mitigate the downside effects of CBI (e.g., unemployment) negatively impact distributional income dynamics. Put in a nutshell, our results support the notion that the policy responses to CBI lead to rising income inequality.

6 Conclusion

Rising inequality has the potential to undermine the social contract. In this paper, we offer a theoretical explanation that directly links the emergence of CBI to rising levels of income inequality over the last 40 years. In particular, we argue that CBI introduces substantive constraints on policymakers to steer overall macroeconomic outcomes, respond to adverse shocks, and impact distributional outcomes. Delegation of power, a reform designed to undercut irresponsible governments, forces them to search for increasingly creative solutions to meet the demands of their constituencies.

We offer here no judgment as to the ethics underpinning this rush to meet these demands. We do note, however, that they have important side effects. In this particular case, governments appear to engage in deregulation in order to salvage their chances of survival. Deregulation, however, generates inequality. In the long-run, one may wonder which is more destabilizing.

Beyond inequality, this paper questions the pertinence of well-intentioned institutional reforms. Central bank independence, *per se*, is not bad. But we should think of these major modifications in the *modus operandi* of a state as tinkering with an extremely complex system. Just like people

tend to be worried about geoengineering as a solution to climate change, so they should perhaps question more incisively the consequences of disabling the principal policy tools that the state can use to shape their economy. A state that cannot engage in fiscal and monetary policy may be an impotent leviathan at the mercy of populist challengers.

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Supplementary Appendix

Contents

This document contains the supplementary appendix for *Does Central Bank Independence Increase Inequality?*.

A1 Inclusion of Additional Control Variables — Baseline Model

Explaining changes in income shares: Additional economic variables

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-1.00***	-0.95***	-0.77***	-0.60**	-0.40	-0.23	-0.03	0.17	0.56	3.26**
	(0.31)	(0.26)	(0.24)	(0.24)	(0.26)	(0.27)	(0.28)	(0.29)	(0.42)	(1.47)
GDP (log)	0.76*	0.93**	0.75*	0.63	0.59	0.64	0.63	0.52	0.17	-5.63*
	(0.42)	(0.38)	(0.45)	(0.52)	(0.56)	(0.56)	(0.51)	(0.42)	(0.47)	(3.20)
Population (log)	0.74	0.16	-0.07	-0.18	-0.25	-0.35	-0.52	-0.61	-0.36	1.45
	(0.72)	(0.63)	(0.67)	(0.73)	(0.79)	(0.80)	(0.78)	(0.70)	(0.80)	(4.71)
Trade (% of GDP)	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
TFP	-0.36	-0.88*	-1.04**	-1.12**	-1.18**	-1.22**	-1.06**	-0.69*	0.04	7.51**
	(0.64)	(0.48)	(0.47)	(0.48)	(0.49)	(0.49)	(0.47)	(0.40)	(0.58)	(3.14)
Industry (% of GDP)	0.01	0.02	0.02**	0.02*	0.02	0.02	0.02	0.01	-0.00	-0.14*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.08)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	608	608	608	608	608	608	608	608	608	608
R^2	0.33	0.36	0.35	0.32	0.29	0.28	0.24	0.18	0.12	0.32

Table A1: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: Additional political variables

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-0.88***	-0.76***	-0.59**	-0.49*	-0.38	-0.25	-0.13	0.06	0.45	2.97**
	(0.26)	(0.27)	(0.27)	(0.25)	(0.25)	(0.24)	(0.21)	(0.22)	(0.35)	(1.44)
GDP (log)	0.26	0.39	0.26	0.15	0.13	0.21	0.35	0.47	0.41	-2.62
	(0.34)	(0.32)	(0.36)	(0.40)	(0.42)	(0.42)	(0.41)	(0.36)	(0.41)	(2.42)
Population (log)	0.30	0.19	0.20	0.23	0.21	0.15	-0.11	-0.28	-0.13	-0.76
	(0.59)	(0.55)	(0.59)	(0.61)	(0.62)	(0.61)	(0.63)	(0.67)	(0.85)	(3.51)
Democracy	-0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.01	-0.01	-0.06
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.15)
Financial Interests	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	623	623	623	623	623	623	623	623	623	623
R^2	0.25	0.27	0.25	0.24	0.22	0.22	0.20	0.15	0.09	0.26

Table A2: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: Additional economic and political variables

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-1.13***	-0.95***	-0.71***	-0.50*	-0.29	-0.11	0.09	0.27	0.59	2.74*
	(0.29)	(0.28)	(0.25)	(0.25)	(0.27)	(0.28)	(0.30)	(0.31)	(0.44)	(1.58)
GDP (log)	0.58	0.85*	0.68	0.52	0.44	0.46	0.48	0.37	0.11	-4.49
	(0.47)	(0.44)	(0.51)	(0.58)	(0.63)	(0.63)	(0.60)	(0.51)	(0.56)	(3.59)
Population (log)	0.53	-0.07	-0.22	-0.28	-0.33	-0.41	-0.63	-0.60	-0.20	2.21
	(0.71)	(0.68)	(0.72)	(0.75)	(0.78)	(0.75)	(0.72)	(0.66)	(0.82)	(4.37)
Trade (% of GDP)	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
TFP	-0.26	-1.01*	-1.28**	-1.42***	-1.42***	-1.39***	-1.22***	-0.79**	0.02	8.76***
	(0.72)	(0.56)	(0.52)	(0.46)	(0.43)	(0.37)	(0.32)	(0.31)	(0.65)	(2.48)
Industry (% of GDP)	0.01	0.02*	0.02**	0.02**	0.02*	0.02	0.02	0.01	-0.01	-0.14*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.08)
Democracy	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.01	-0.17
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.15)
Financial Interests	0.00*	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	523	523	523	523	523	523	523	523	523	523
R^2	0.33	0.36	0.35	0.33	0.31	0.30	0.27	0.20	0.13	0.33

Table A3: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

A2 Robustness Checks

Removing two years before CBI reform

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-0.84***	-0.78**	-0.63**	-0.56*	-0.45	-0.31	-0.15	0.05	0.58	3.10*
	(0.31)	(0.29)	(0.29)	(0.28)	(0.29)	(0.28)	(0.24)	(0.21)	(0.37)	(1.64)
GDP (log)	0.25	0.42	0.28	0.13	0.06	0.11	0.21	0.28	0.18	-1.91
	(0.35)	(0.33)	(0.36)	(0.39)	(0.40)	(0.41)	(0.40)	(0.37)	(0.45)	(2.44)
Population (log)	0.40	0.03	-0.05	-0.07	-0.07	-0.06	-0.19	-0.27	0.17	0.12
	(0.55)	(0.49)	(0.51)	(0.51)	(0.53)	(0.55)	(0.59)	(0.65)	(0.79)	(3.28)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	556	556	556	556	556	556	556	556	556	556
R^2	0.29	0.32	0.29	0.27	0.24	0.22	0.18	0.12	0.12	0.27

Table A4: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. As instrumental variable, we use the first lag of the CBI Index. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Removing two years after CBI reform

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-0.71**	-0.67**	-0.51*	-0.42	-0.33	-0.23	-0.12	0.05	0.37	2.58
	(0.31)	(0.31)	(0.29)	(0.28)	(0.28)	(0.27)	(0.24)	(0.23)	(0.38)	(1.61)
GDP (log)	0.24	0.49	0.41	0.33	0.28	0.32	0.43	0.50*	0.41	-3.42
	(0.34)	(0.33)	(0.36)	(0.38)	(0.39)	(0.38)	(0.35)	(0.30)	(0.40)	(2.22)
Population (log)	0.77	0.36	0.20	0.14	0.10	0.05	-0.20	-0.36	-0.24	-0.82
	(0.59)	(0.54)	(0.51)	(0.49)	(0.50)	(0.50)	(0.52)	(0.60)	(0.82)	(2.94)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	638	638	638	638	638	638	638	638	638	638
R^2	0.28	0.33	0.31	0.30	0.27	0.26	0.24	0.17	0.11	0.31

Table A5: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. As instrumental variable, we use the first lag of the CBI Index. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Accounting for CBI reform in the past five years

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-0.73**	-0.64**	-0.49*	-0.39	-0.27	-0.12	0.01	0.17	0.48	1.97
	(0.29)	(0.27)	(0.26)	(0.24)	(0.23)	(0.23)	(0.21)	(0.20)	(0.32)	(1.40)
Reform (-5 years)	0.01	0.06	0.07	0.07	0.08*	0.10**	0.10**	0.10**	0.05	-0.64**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.30)
GDP (log)	0.32	0.44	0.33	0.24	0.20	0.26	0.35	0.44	0.37	-2.94
	(0.33)	(0.31)	(0.34)	(0.38)	(0.39)	(0.39)	(0.37)	(0.32)	(0.38)	(2.30)
Population (log)	0.67	0.49	0.40	0.35	0.34	0.31	0.08	-0.18	-0.26	-2.20
	(0.56)	(0.51)	(0.50)	(0.48)	(0.48)	(0.48)	(0.50)	(0.54)	(0.75)	(2.87)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	726	726	726	726	726	726	726	726	726	726
R^2	0.27	0.31	0.29	0.27	0.25	0.24	0.21	0.16	0.10	0.29

Table A6: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. As instrumental variable, we use the first lag of the CBI Index. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: Instrumental Variable Estimation

	(1) 0-10	(2) 10-20	(3) 20-30	(4) 30-40	(5) 40-50	(6) 50-60	(7) 60-70	(8) 70-80	(9) 80-90	(10) 90-100
CBI	-0.86***	-0.71***	-0.53**	-0.42*	-0.30	-0.18	-0.05	0.16	0.55	2.34*
	(0.27)	(0.27)	(0.26)	(0.24)	(0.24)	(0.23)	(0.20)	(0.21)	(0.37)	(1.37)
GDP (log)	0.29	0.34	0.18	0.09	0.07	0.14	0.25	0.33	0.27	-1.95
	(0.33)	(0.31)	(0.34)	(0.37)	(0.39)	(0.39)	(0.37)	(0.33)	(0.39)	(2.22)
Population (log)	0.59	0.53	0.50	0.48	0.46	0.40	0.18	-0.02	-0.07	-3.07
	(0.56)	(0.52)	(0.53)	(0.52)	(0.53)	(0.53)	(0.53)	(0.55)	(0.77)	(2.99)
Democracy	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01	-0.01	-0.12
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.13)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	692	692	692	692	692	692	692	692	692	692
R^2	0.27	0.30	0.29	0.28	0.26	0.25	0.22	0.16	0.08	0.30
Mean of DV										
SD of DV										

Table A7: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. As instrumental variable, we use the first lag of the CBI Index. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: Instrumental Variable Estimation

	(1) 0-10	(2) 10-20	(3) 20-30	(4) 30-40	(5) 40-50	(6) 50-60	(7) 60-70	(8) 70-80	(9) 80-90	(10) 90-100
CBI	-0.70**	-0.74**	-0.66*	-0.62*	-0.54	-0.51	-0.43	-0.24	0.35	4.11*
	(0.33)	(0.37)	(0.36)	(0.36)	(0.39)	(0.40)	(0.37)	(0.33)	(0.48)	(2.25)
GDP (log)	0.32	0.37	0.22	0.14	0.12	0.19	0.30	0.37	0.26	-2.29
	(0.33)	(0.32)	(0.34)	(0.37)	(0.39)	(0.38)	(0.36)	(0.32)	(0.40)	(2.21)
Population (log)	0.62	0.49	0.41	0.35	0.31	0.19	-0.06	-0.27	-0.17	-1.89
	(0.56)	(0.53)	(0.56)	(0.60)	(0.64)	(0.66)	(0.67)	(0.65)	(0.82)	(3.69)
Democracy	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	-0.01	-0.10
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.13)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	661	661	661	661	661	661	661	661	661	661
R^2	0.28	0.31	0.30	0.29	0.26	0.25	0.22	0.15	0.08	0.30
Mean of DV										
SD of DV										

Table A8: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. As instrumental variable, we use the interaction term between the average CBI in neighboring countries multiplied by the first lag of CBI. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: Adjusted standards errors following Driscoll and Kraay (1998)

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-0.75***	-0.71***	-0.56***	-0.47**	-0.36**	-0.24*	-0.11	0.06	0.42**	2.72**
	(0.16)	(0.16)	(0.18)	(0.18)	(0.15)	(0.13)	(0.12)	(0.13)	(0.16)	(1.04)
GDP (log)	0.32	0.46**	0.35	0.26	0.23	0.28	0.38	0.47**	0.38*	-3.12*
	(0.23)	(0.20)	(0.24)	(0.26)	(0.27)	(0.26)	(0.23)	(0.18)	(0.22)	(1.64)
Population (log)	0.66	0.45	0.35	0.30	0.28	0.24	0.01	-0.25	-0.30	-1.74
	(0.56)	(0.39)	(0.37)	(0.37)	(0.36)	(0.31)	(0.24)	(0.21)	(0.49)	(1.87)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	726	726	726	726	726	726	726	726	726	726
r2										

Table A9: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. As instrumental variable, we use the interaction term between the average CBI in neighboring countries multiplied by the first lag of CBI. Standard errors based on estimation procedure following Driscoll and Kraay (1998). Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: GMM Estimation Results

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-2.55***	-2.08***	-1.71***	-1.63***	-1.37***	-0.97***	-0.58	-0.31	-0.14	11.56***
	(0.79)	(0.79)	(0.66)	(0.54)	(0.38)	(0.29)	(0.46)	(0.75)	(0.64)	(2.42)
GDP (log)	0.88*	1.01**	0.99**	0.93***	0.86**	0.81**	0.64**	0.21	-0.15	-6.17***
	(0.48)	(0.42)	(0.40)	(0.36)	(0.36)	(0.33)	(0.31)	(0.16)	(0.32)	(2.19)
Population (log)	-0.56	-0.27	-0.24	-0.19	-0.19	-0.26***	-0.33	-0.03	-0.32	2.54
	(.)	(0.46)	(0.54)	(0.56)	(0.47)	(0.09)	(0.43)	(0.49)	(.)	(3.32)
Polity2	0.05	0.04	0.04	0.03	0.04	0.02	0.00	-0.03	-0.07	-0.16
	(0.04)	(.)	(.)	(.)	(.)	(0.02)	(0.04)	(0.05)	(0.06)	(0.12)
First lag	0.20	0.17*	0.16	0.12	0.18	0.29	0.50*	0.58**	0.22***	0.26*
	(.)	(0.09)	(0.14)	(0.16)	(0.16)	(0.19)	(0.29)	(0.23)	(0.08)	(0.15)
Observations	117	117	117	117	117	117	117	117	117	117
Period FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sargan Pr>χ^2	0.31	0.00	0.01	0.01	0.00	0.00	0.00	0.03	0.23	0.00
AR(1)	0	1	1	1	0	0	0	0	0	0
AR(2)	0	0	1	1	1	1	0	0	1	1
# Instruments	26	26	26	26	26	26	26	26	26	26
Wald χ^2	127.99	14.03	72.28	5.03	11.80	29.39	35.76	46.86	0.24	38.32
# Countries	42	42	42	42	42	42	42	42	42	42

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. Standard errors clustered by country. Estimations are based on a one-step first difference GMM model. GMM instruments are collapsed to avoid overfitting. Endogenous variables are the first lag of the dependent variable and CBI. AR (1) and AR (2) are the p-values of the test statistics for first and second order serial correlation in first differenced residuals. Robust standard errors in parentheses are clustered at the country-year level. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: GMM Estimation Results

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-3.39***	-1.23	-1.04	-1.36	-1.00	-0.57	-0.60	-0.19	-0.30	3.70
	(1.00)	(1.21)	(1.19)	(0.97)	(1.13)	(0.94)	(0.58)	(0.70)	(1.06)	(5.19)
GDP (log)	0.72**	0.44	0.53	0.72	0.55	0.58	0.59*	0.19	0.14	-4.22**
	(0.35)	(0.34)	(0.46)	(0.44)	(0.54)	(0.42)	(0.35)	(0.40)	(0.61)	(2.11)
Population (log)	-0.69	0.23	0.11	0.01	-0.11	0.04	-0.16	-0.00	-0.46	1.26
	(0.64)	(0.83)	(1.01)	(0.92)	(1.16)	(0.95)	(0.61)	(0.59)	(0.93)	(6.37)
Polity2	0.03	0.04	0.03	0.02	0.03	0.04	0.04*	0.01	-0.02	-0.24
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.03)	(0.02)	(0.03)	(0.05)	(0.24)
First lag	0.07	0.38*	0.36	0.13	0.33	0.32	0.35	0.57*	0.19	0.55**
	(0.15)	(0.20)	(0.24)	(0.20)	(0.29)	(0.28)	(0.27)	(0.31)	(0.35)	(0.24)
Observations	122	122	122	122	122	122	122	122	122	122
Period FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sargan Pr>χ^2	0.25	0.04	0.05	0.04	0.02	0.01	0.01	0.02	0.35	0.00
AR(1)	0	1	0	1	0	0	0	0	0	0
AR(2)	0	1	1	1	1	0	0	0	1	1
# Instruments	26	26	26	26	26	26	26	26	26	26
Wald χ^2	661.00	148.55	72.44	50.87	26.58	40.16	60.85	64.28	51.73	161.98
# Countries	42	42	42	42	42	42	42	42	42	42

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. Standard errors clustered by country. Estimations are based on a two-step first difference GMM model. GMM instruments are collapsed to avoid overfitting. Endogenous variables are the first lag of the dependent variable and CBI. AR (1) and AR (2) are the p-values of the test statistics for first and second order serial correlation in first differenced residuals. We applied orthogonal adjustment to account for gaps in the data. Robust standard errors in parentheses are clustered at the country level. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Explaining changes in income shares: Government ideology

	(1) D1	(2) D2	(3) D3	(4) D4	(5) D5	(6) D6	(7) D7	(8) D8	(9) D9	(10) D10
CBI	-0.83***	-0.71**	-0.53**	-0.41*	-0.27	-0.12	0.01	0.18	0.51	2.18*
	(0.28)	(0.29)	(0.26)	(0.23)	(0.22)	(0.20)	(0.17)	(0.19)	(0.35)	(1.30)
GDP (log)	0.32	0.44	0.33	0.26	0.23	0.29	0.39	0.48	0.34	-3.07
	(0.34)	(0.31)	(0.35)	(0.38)	(0.39)	(0.40)	(0.38)	(0.34)	(0.39)	(2.30)
Population (log)	0.78	0.79	0.61	0.51	0.48	0.51	0.39	0.27	0.15	-4.49
	(0.47)	(0.48)	(0.52)	(0.57)	(0.64)	(0.68)	(0.69)	(0.62)	(0.63)	(3.71)
Right	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Center	0.03	-0.02	-0.08	-0.12	-0.15*	-0.16**	-0.17**	-0.16**	-0.06	0.88*
	(0.10)	(0.10)	(0.09)	(0.08)	(0.08)	(0.07)	(0.06)	(0.07)	(0.11)	(0.50)
Left	0.07	0.10**	0.11**	0.12***	0.13***	0.14***	0.14***	0.09**	0.01	-0.90***
	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)	(0.29)
Other/DK	0.00	0.02	-0.00	-0.00	-0.00	0.00	0.01	0.02	0.01	-0.06
	(0.08)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.08)	(0.29)
Polity: 10 (democ) -10 (auto)	-0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	-0.01	-0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.14)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	694	694	694	694	694	694	694	694	694	694
R^2	0.26	0.30	0.30	0.29	0.29	0.28	0.26	0.19	0.08	0.32

Table A12: Effect of CBI on inequality. The dependent variable is the share of income as a percentage of total income, divided by decile. For instance, the first column represents the percentage of total income earned by the bottom 10% of the population. Standard errors clustered by country. Symbols: $*$: $p < 0.1$; $**$: $p < 0.05$; $***$ $p < 0.01$.

Supplementary Online Appendix: References

Driscoll, John C, and Aart C Kraay. 1998. "Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data." *Review of Economics and Statistics* 80 (4): 549–560.