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Macro Implications of Inequality-driven Political Polarization*

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Abstract
This paper builds a model of heterogenous agents, incomplete markets and idiosyncratic shocks extended with a political mechanism that allows for realistic party competition. Higher inequality leads to more disperse policy preferences, to which parties respond endogenously distancing themselves from median voter preferences. The polarization of party proposals leads to greater uncertainty before elections, as well as greater policy switches after them, with significant macroeconomic effects. Results are in line with previous empirical evidence linking inequality, polarization and macroeconomic performance. The model is solved introducing political quasi-aggregation, and can be extended to analyze different economic policies and alternative political institutions.

Resumen
Este trabajo construye un modelo de agentes heterogéneos, mercados incompletos y shocks idiosincráticos que además incluye un mecanismo político que permite incluir la competencia entre partidos políticos. Mayores niveles de desigualdad llevan a preferencias políticas más dispersas a lo que los partidos responden endógenamente distanciándose de las preferencias del votante mediano. La polarización de las propuestas de política de los partidos genera mayor incertidumbre antes de las elecciones y a cambios más significativos en políticas luego de éstas, con efectos macroeconómicos significativos. Estos resultados son consistentes con evidencia empírica previa que estudia la relación entre desigualdad, polarización y la macroeconomía. El modelo es resuelto mediante cuasi agregación política y puede ser utilizado para analizar diferentes políticas e instituciones.

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1 Introduction

Inequality has become a serious concern, not only by itself but also because of its economic consequences. According to the Global Risks Perception Survey prepared by the World Economic Forum (WEF, 2025), inequality ranks high among risks that may lead to negative and significant impacts on global economic activity.[1] Moreover it is perceived as the most central risk of all, playing a significant role in triggering other risks. One of these risks is widespread societal and political polarization, which also has ranked high among global risks during the last years. Notwithstanding its relevance, the exploration of the potential macroeconomic effect of inequality-driven political polarization hasn't attracted enough attention of academic work.

As inequality pushes its way to the forefront of public debate, the macro literature has not lagged behind in analyzing its consequences. Greater availability of data for many countries and during longer periods of time has allowed to document a significant variation of economic inequality across time and space. Concurrently with this there has been a strong development in the last decades of quantitative models to assess the economic causes and consequences of inequality variations. In particular quantitative models of heterogeneous agents, the natural environment to study this issue, have become increasingly popular in macroeconomics. However, despite their rich heterogeneity, they have been seldom used to analyze the *political* implications of inequality variations, and how these in turn affect the economy.[2]

Most of the political economy literature on the consequences of inequality is based, at least indirectly, on its positive relationship with redistribution as implied by the median voter collective choice mechanism (Downs, 1957; Romer, 1975; Meltzer and Richard, 1981), where greater pre-tax inequality leads smoothly to more redistribution. But, as put forward by Roemer (2009), the price of getting the simplicity this model delivers, is the elimination of politics from political competition. Hence, the broader connection between economic inequality and politics, concerning issues like political polarization and conflict, and how these affect the economy, have been less explored theoretically, and it is absent in heterogenous agents models.

This paper studies the effects of inequality through politics, with an explicit role for political polarization and party competition. To do this it builds a model of heterogenous agents, incomplete markets and idiosyncratic shocks extended with a political mechanism that departs from the median voter theorem, following the approach introduced by Wittman (1973), and further developed by Roemer (2009). The model generates an empirically plausible wealth distribution and contains a more realistic and historically more accurate description of the political process. Agents have well

[1] The Global Risks Perception Survey involves the participation of 900 global leaders across academia, business, government, international organizations and civil society.

[2] Boppart et al. (2018) argue that exploring the political realm where inequality affects the macroeconomy, through the workings of democracy for example, is among the main reasons for the increasing emphasis on inequality by macroeconomists. However, they add, this realm is not yet well explored.

defined preferences over taxes, depending on their wealth, labor efficiency and other individual state variables. Public revenue is used by the party in power to finance transfers, which play a distributional as well as an insurance role. Political parties care about the welfare of their voters, and compete in elections to implement their desired policies. This, together with an imperfect knowledge of the mapping between policy proposals and votes, lead political parties to propose taxes that differ from the one preferred by the median and from each other. The model is then one in which taxes are stochastic, but with a probability distribution that is endogenous, reflecting the political preferences of the population.

I use the model to assess the political consequences of inequality, as well as how these affect the macroeconomy. More inequality leads to more disperse preferences over policy. The gap between tax preferences of an agent (rich or poor) and the median voter increases. This result, a positive correlation between inequality and political polarization has been widely discussed and is in line with empirical evidence (McCarty et al., 2016; Aguirre, 2023). Preferences' dispersion leads parties to propose policies that are further away from each other, generating polarization of policy platforms, with significant effects on the economy, both before the election through economic uncertainty (Aguirre, 2023), and after the election through tax-driven partisian cycles (Azzimonti and Talbert, 2014).

Although the paper focuses on quantitative analyses of the mechanisms linking inequality and the macroeconomy, I also present some motivating empirical evidence. The aim is twofold. First, to uphold the view that inequality affects the economy through political disagreement. Second, to give support to the main channels of the model described above. This evidence, based on panel data estimations with fixed-effects at a country level, uncovers significant correlations between inequality and the polarization of preferences for redistribution of voters and political parties, and with larger swings in policies when executive power is obtained by parties with different ideological positions.

Analytically the contribution of the paper is the introduction, in a quantitative model with rich heterogeneity, of a political mechanism that exploits the dispersion of political preferences and generates party competition. I build on Roemer (2009), who shows that a combination of party preferences a la Wittman (1973), where parties can commit and care about the welfare of voters, plus uncertainty regarding how policy platforms translate in the fraction of votes obtained, gives a role for party competition. Only in this case there is a trade-off to deviate from the policy preferred by the median voter. Although this strategy implies a net-lost in terms of votes, the probability of winning only falls smoothly and the party is able to improve the welfare of its electoral constituency. Policy proposals are an outcome of Nash equilibrium between the parties at every election date and depend on aggregate state variables. I propose a specification for modeling this structure in a quantitatively meaningful way and, as the political structure makes the model non-stationary, apply a political quasi-aggregation technique, following the economic quasi-aggregation introduced

by Krusell and Smith (1998), that allows for a precise computation of the model.[3] The model can be easily extended to analyze the political economy of different policies as well as alternative political institutions under rich economic heterogeneity and party competition.

After a literature review in section 2, the motivating empirical evidence is presented in section 3. Section 4 describes the model, section 5 its calibration and section 6 shows the quantitative results. Section 7 concludes.

2 Literature Review

There is abundant work related to the political consequences of inequality, and how this in turn affects the economy, the general theme of this paper. On the political consequences of economic inequality the closest group of papers links the former and political polarization. A broad analysis is done by McCarty et al. (2016), concluding that the two have been closely related for the post-war period in the US. Aguirre (2023) finds a statistically significant relationship for a panel of 25 mostly developed countries and about four decades.[4]

Regarding the link between politics and the macroeconomy the analysis by Azzimonti and Talbert (2014) consider polarization as a cause of business cycles.[5] Party alternation in power induces excess policy volatility in polarized societies. This is consistent with the mechanism in this paper, where the analysis additionally incorporates economic inequality as the primary force, policy uncertainty explicitly, and endogenous policies by modeling political competition. Another branch of the literature, mostly empirical, is one in which elections generate drops in economic activity due to policy uncertainty. Canes-Wrone and Park (2012) find a negative effect of elections on investment in OECD countries, arguing that the effect is driven by political polarization, while Julio and Yook (2012) and Julio (2016) show a similar result using data on firms in developing countries. The role of inequality in driving these effects is explored in Aguirre (2023), who identifies drops in economic activity around elections but only in times of relatively high economic inequality. This unequal political business cycle (UPBC) is found both in a panel of mostly advanced economies and in time-series for the US for the post-war period, in which case the evidence also shows a spike of policy uncertainty only in periods of high inequality.[6]

[3] Interestingly political quasi-aggregation makes clear that the link between inequality and polarization exists regardless of any specific knowledge by agents about their position on the income or wealth distribution.

[4] McCarty et al. (2016) find that partisanship has become more stratified by income due to party polarization and economic inequality. See also Pontusson and Rueda (2008); Garand (2010); Grechyna (2016); Duca and Saving (2016) for evidence on the relationship between economic inequality and political polarization.

[5] See also Azzimonti (2018) for evidence on the effect of partisan conflict on investment. Müller et al. (2016) consider public debt as the outcome over which partisan preferences affect the macroeconomy.

[6] Using micro data Aguirre (2023) also shows a (relative) drop in the consumption-income ratio of wealth-poor agents in times of elections, supporting precautionary motives as a cause for the drop in private consumption during election years.

On the methodological side the paper relates to heterogenous agents models, particularly the few of them that endogenize politics. In this setting agents rationally predict the effect of current policy alternatives on current and future prices as well as on future policies, while disperse preferences over policy are induced via the economic equilibrium and not considered primitives. The canonical paper by Krusell and Rios-Rull (1999) consider a median voter equilibrium in an economy without idiosyncratic or aggregate shocks.[7] Corbae et al. (2009) build on Krusell and Rios-Rull (1999), extending their analysis to idiosyncratic shocks, and analyze the consequences of risk and precautionary behaviour in the determination of tax rates, again using the median voter theorem and without aggregate shocks. Finally, Bachmann and Bai (2013) endogenizes policy through a social choice mechanism where political representation depends on wealth in a model with aggregate productivity shocks and idiosyncratic uncertainty.[8] This paper contributes to this literature mainly by departing from the median voter as the collective choice mechanism, considering instead a more realistic political process which, in turn, generates policy uncertainty, a feature that hasn't been analyzed so far in models of ex-post heterogeneity and politics.

As already stated, the political structure is based on the model of political competition presented by Roemer (2009), where he also analyses extensions such as endogenous parties, multidimensional policies and party factions. Different versions of the model has been applied to varied policy issues by Roemer (1999), Cremer et al. (2008) and Chatterjee and Eyigungor (2023), among others. It has not been implemented before in a quantitative model of heterogeneous agents with idiosyncratic risk.

Often used as an alternative to Downs (1957) are the so-called probabilistic voting models. Their distinctive feature is uncertainty about the mapping from policy to aggregate voting behavior, smoothing-out the relationship between policies and winning probabilities. The model adopted in this paper can be classified as a particular case of the probabilistic-voting model since uncertainty is necessary but not sufficient to obtain policy divergence. It further departs from Downs (1957) in modifying the assumption of purely office-motivated politicians. This assumption is relaxed as well by the citizen-candidate model by Osborne and Slivinski (1996) and Besley and Coate (1997), where the commitment assumption is also dropped. In this case policies are stochastic, with a probability distribution that depends on voters' policy preferences, as it is the case in this paper. However there are no parties, in the sense that the selected candidate determines policies according solely to his preferences. In this paper parties care about the utility of a group of voters, and trades-off the maximization of it with the probability of winning elections.

[7] The equilibrium concept they adopt is analyzed in Krusell et al. (1997). They compare it to other papers studying voting and economic growth.

[8] Hassler et al. (2003) analyze endogenous redistribution in a dynamic model with rich economic heterogeneity and majority voting. Since they look for analytical solutions economic inequality is restricted and not calibrated to the data as it is the case in quantitative models. See also Hassler et al. (2005), Song et al. (2012) and Müller et al. (2016) for different extensions of the model in Hassler et al. (2003).

3 Motivating Evidence

Although the scope of the paper is quantitative, in this section I present some motivating evidence regarding the relationship between economic inequality and both, political polarization and macroeconomic policy. The exercises described here, consisting on panel estimations with country fixed effects, uncover significant correlations that are consistent with the channels of the quantitative model presented in this paper. They also motivate the study of the economic consequences of inequality through politics. First I show, using survey data, that inequality is positively associated with the polarization of political preferences at the individual level. The second piece of evidence relates inequality with the ideological position of parties. As in the case of voters, parties are also more polarized when inequality is higher. Finally I show that partisan differences in transfers and tax revenues are more pronounced for high levels of inequality.

To explore the relationship between inequality and voters' polarization I use data from the World Value Survey, a representative social survey, providing data on beliefs, which has been conducted globally every 5 years since 1981. The number of countries varies by wave but there are at least 35 countries with 3 or more waves to pursue the exercises intended here. As a proxy for preferences for redistribution I follow Alesina and Giuliano (2011), who study the general determinants of this type of preferences, and consider a question about the relevance of the role of government in providing for the people.[9] In addition I include a question in which the respondent is asked to position him or herself in a 1 to 10 left-right ideological scale. I test how some moments of the distribution of responses, measured at a country level, correlates with inequality. For inequality I use the gini index of disposable income from the Standardized World Income Inequality Database (Solt, 2020). The advantage of this data is its coverage. The left panel of Table 1 shows results from panel regression including country fixed effects and wave dummies. In the first two columns I consider the mean of the responses at a country-wave level as a dependent variable and don't find a significant correlation. However, when considering their dispersion, measured as the standard deviation of individual responses at a country-wave level, the coefficient becomes positive and highly significant for both the proxy for preferences for redistribution and the position on the right-left scale. The same happens when considering the percentage of the population with responses in any of the two extremes in the last two columns of the left panel. Therefore the data confirms a positive and significant correlation between inequality and proxies for political polarization, a pattern that is at the core of the mechanism driving the results in this paper.[10]

[9] Specifically, the question reads "How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between. 'People should take more responsibility to provide for themselves (1) versus 'The government should take more responsibility to ensure that everyone is provided for (10)."

[10] In simple models of preferences for redistribution these depend mainly in the gap between individual and average income (See for instance chapter 3 in Persson and Tabellini, 2002). Then a higher dispersion or more extreme

To see if inequality is also correlated with party polarization I construct a proxy for this variable using data from the Manifesto Project Database (Lowe et al., 2011). This database provides estimates of parties' positions in electoral years based on text analysis of their programmes as well as their election performance. I construct polarization proxies for different policy dimensions as the absolute difference between the position of major left and right parties.[11] I consider three policy dimensions: Social, Market Economy and Welfare. The last one is the most closely related to redistribution issues as it includes the party stance on the expansion or limitation of the Welfare State. The first two are included for comparisons. Results from panel regressions with country fixed effects are shown in the right panel of Table 1. In the first column we can see no significant correlation between inequality and polarization of parties regarding social issues. In the second one we observe a negative correlation. This is probably capturing the acceptance by left parties of pro-market policies. The last one, which is the one we are interested in this paper, shows a positive and significant correlation with inequality. In the model below the political mechanism is such that, due to voters' polarization, parties endogenously position their policy proposals further apart from each other. This is consistent with the correlations shown so far.

Finally I explore whether inequality is associated not only with party positions but also with the policies actually implemented by governments. Specifically I test if policy divergence between parties with opposite locations in the ideological scale correlates positively with inequality. For policy I consider transfers as a percentage of average income and tax revenues as a percentage of GDP, which are the policy variables the model focuses on. The explanatory variable is the identity of the party in power. The data is from the Database of Political Institutions (Cruz et al., 2020). They report the orientation of the executive's party with respect to economic policy, i.e. whether it is left, center or right-wing oriented. Hence I assign three possible values for the variable Party in Power; -1, 0 and 1 for each of the categories, respectively. In the first column of Table 2 I show the results when using transfers as the dependent variable, without including inequality yet. In this and all of the other regressions I include as additional controls a lag of the dependent variable, to better capture dynamics, and the unemployment rate, the output gap and country specific time trends (coefficients not shown in Table 2) to try to isolate policy driven variations in the dependent variables. There is no significant correlation between the identity of the party in power and transfers according to this estimation.[12] In column (2) I include an interaction between the Party in Power variable and the gini index, adjusted by its country mean to ensure that the results are only driven by time variation.[13] The parameter on this interaction captures how sensitive to inequality are the

realizations of income translate directly into more dispersion or more extreme preferences.

[11] I pick the two parties most voted in an election and compute the absolute difference between the two as in Pontusson and Rueda (2008). See Aguirre (2023) and Canes-Wrone and Park (2012) for related analysis.

[12] This policy convergence is consistent with the median voter theorem. Probably, differences between policies pursued by different parties are not as large as to be able to identify a significant effect.

[13] Because the focus is on the interaction term the inclusion of a fixed-effect is not enough to isolate the estimation from cross-section variation.

differences in policies pursued by different governments of divergent orientations. The results show that this coefficient is negative and significant. This means that only under high inequality there is policy divergence. In particular when inequality is the highest (relative to the mean), transfers are 20% of average income higher under a left-wing than under a right-wing government. The right panel shows the same exercise with tax revenues as the dependent variable. The pattern is similar. There are no statistically significant unconditional differences between parties. When the interaction is included in the last column the coefficient becomes negative and significant, again implying that under high inequality governments from different orientations do pursue different policies.

The empirical exercises revised in this section are not intended to test the predictions of the model as they are not specified for dealing with causality. However they support the main mechanism since this manifests itself generating a correlation between inequality, the exogenous factor, with polarization of voters, parties and policies.

4 The Model

First I describe the economic environment taking as given the way policy is implemented. Once I define the economic equilibrium I turn to the description of the political mechanism that endogenize policy. Finally I describe how the model is solved by political quasi-aggregation.

Economic Environment

The economy is inhabited by a continuum of infinitely lived agents of measure 1, who discount the future at a rate β. Each period they consume c units of the good, decide how much hours to work ℓ, and accumulate assets a subject to a borrowing limit $a \geq 0$. Agents differ in labor efficiency, denoted by $\epsilon \in E$, which follows a Markov process with transition probability $\pi_\epsilon(\epsilon'|\epsilon)$. Define as $\Phi(a, \epsilon)$ the distribution over individual state variables.

Assets' income ra and labor income $w\epsilon\ell$, where r and w are the equilibrium interest rate and wage, respectively, are taxed at rate τ, and all agents receive a lump-sum transfer T by the government. Revenues are also used to finance a public good in an amount g, valued by all agents in the economy.

Political institutions are as follows. There are repeated elections and the winners govern for S periods, $s = 1, ..., S$. They start their first period implementing the tax rate they had proposed at the election they won. That rate is kept constant during their tenure and one period before the expiration of its mandate, $s = S-1$, the next government, which will take power after S, is elected.

Agent's problem for periods $s = 1, .., S-2$ (when there is neither and election nor a switch in

government) is the following

$$\begin{aligned} V_s(a,\epsilon;\Phi,\tau) &= \max_{c,\ell,a'\geq 0} u(c,\ell,g)+\beta E\left[V_{s+1}(a',\epsilon',\upsilon';\Phi',\tau)|e,\upsilon\right] \\ \text{s.t. } c+a' &= w(\Phi,\tau)\ell\epsilon(1-\tau)+(1+(1-\tau)r(\Phi,\tau))a+T(\Phi,\tau) \\ \Phi' &= H_s(\Phi,\tau) \end{aligned}$$

where H_s is the law of motion for the distribution. Note that the aggregate state variable τ doesn't change form s to $s+1$ when $s<S-2$.

Now consider the consumer's problem in period S, which is the last period of the government in power. Recall that at this stage the next government has been elected already, and agents know for sure the tax rate it will implement in its first period in office. Call this tax rate τ^e. Then the problem reads

$$\begin{aligned} V_S(a,\epsilon;\Phi,\tau,\tau^e) &= \max_{c,\ell,a'\geq 0} u(c,\ell,g)+\beta E\left[V_1(a',\epsilon';\Phi',\tau^e)|e\right] \\ \text{s.t. } c+a' &= w(\Phi,\tau)\ell\epsilon(1-\tau)+(1+(1+(1-\tau)r(\Phi,\tau))a+T(\Phi,\tau) \\ \Phi' &= H_S(\Phi,\tau,\tau^e) \end{aligned}$$

where, again, H_S is the law of motion for the distribution. Now τ^e is a new state variable and the tax rate at which the next period value function is evaluated.

Finally, to solve their problem in period $s=S-1$ agents need to form expectations about the outcome of the election, i.e. about τ^e. The probability distribution of this variable is endogenous and comes from a political mechanism. For now let's assume it depends on aggregate state variables (Φ,τ) and denote it by $\pi(\tau^e|\Phi,\tau)$, postponing its description until after the definition of the economic equilibrium. Given this transition probability the problem for period $s=S-1$, just before the election, is

$$\begin{aligned} V_{S-1}(a,\epsilon;\Phi,\tau) &= \max_{c,\ell,a'\geq 0} u(c,\ell,g)+\beta\sum_{\tau^e}\pi(\tau^e|\Phi,\tau)E\left[V_S(a',\epsilon';\Phi',\tau,\tau^e)|e\right] \\ \text{s.t. } c+a' &= w(\Phi,\tau)\ell\epsilon(1-\tau)+(1+(1-\tau)r(\Phi,\tau))a+T(\Phi,\tau) \\ \Phi' &= H_{S-1}(\Phi,\tau) \end{aligned}$$

where, as in the previous cases, H_{S-1} is the law of motion for the distribution.

The last elements in the economic side are a representative firm with a CRS production function $F(K,L)$, where K is capital (that depreciates at rate δ) and L labor efficiency units employed by the representative firm, and a balanced budget for the government, where it is assumed that a fraction ψ of total revenues are destined to finance the public good and the remaining go to transfers.

We can now define the recursive competitive equilibrium (RCE).

Given $\pi(\tau^e|\Phi,\tau)$, a RCE is a set of functions V_s, a'_s, ℓ_s, c_s, r, w, T and H_s, for $s=1...,S$, such that

1. Given $w(\Phi,\tau)$ and $r(\Phi,\tau)$, $V_s(a,\epsilon;\Phi,\tau)$, $a'_s(a,\epsilon;\Phi,\tau)$, $\ell_s(a,\epsilon;\Phi,\tau)$ and $c_s(a,\epsilon;\Phi,\tau)$, when $s < S$, and $V_S(a,\epsilon;\Phi,\tau,\tau^e)$, $a'_S(a,\epsilon;\Phi,\tau,\tau^e)$, $\ell_S(a,\epsilon;\Phi,\tau,\tau^e)$ and $c_S(a,\epsilon;\Phi,\tau,\tau^e)$, solve agents' problem.

2. Given $w(\Phi,\tau)$ and $r(\Phi,\tau)$, $K(\Phi)$ and $L(\Phi,\tau)$ satisfy

$$\begin{aligned} r(\Phi,\tau) &= F_K(K(\Phi),L(\Phi,\tau)) - \delta \\ w(\Phi,\tau) &= F_L(K(\Phi),L(\Phi,\tau)) \end{aligned}$$

3. Government Budget Constraint

$$\begin{aligned} T(\Phi,\tau) &= (1-\psi)\tau\left[w(\Phi,\tau)L(\Phi,\tau) + r(\Phi,\tau)K(\Phi)\right] \\ g(\Phi,\tau) &= \psi\tau\left[w(\Phi,\tau)L(\Phi,\tau) + r(\Phi,\tau)K(\Phi)\right] \end{aligned}$$

4. Market Clearing

$$\begin{aligned} K(\Phi) &= \int a \, \mathrm{d}\Phi \\ L(\Phi,\tau) &= \int \ell_s(a,\epsilon;\Phi,\tau)\epsilon \, \mathrm{d}\Phi \quad \forall s \\ \int c_s(a,\epsilon;\Phi,\tau) \, \mathrm{d}\Phi + \int a'_s(a,\epsilon;\Phi,\tau) \, \mathrm{d}\Phi &= F(K(\Phi),L(\Phi,\tau)) + (1-\delta)K(\Phi,\tau) \quad \forall s \end{aligned}$$

5. The aggregate law of motions $H_s(\Phi,\tau)$ are generated by transition probabilities $\pi_\epsilon(\epsilon'|\epsilon)$ and policies $a'_s(a,\epsilon;\Phi,\tau)$.

Political Mechanism

Now we describe how $\pi(\tau^e|\Phi,\tau)$ is obtained as an equilibrium. I adapt the framework studied by Roemer (2009), which combines party preferences a la Wittman (1973), where parties care about the welfare of voters, with uncertainty regarding how policy platforms translate into elections' winning probabilities.

There are two parties in the economy, denoted by $P = R, L$. If one of them is elected, it implements a tax rate τ^P when gaining power. This tax rate has to be announced before the election and there is full commitment, so the elected government sets that tax rate once in power. Next I describe the way parties decide τ^P and the corresponding winning probabilities for each party.

An agent with individual state (a,ϵ) when the aggregate state is (Φ,τ) votes for R if

$$V_S(a,\epsilon;\Phi,\tau,\tau^R) > V_S(a,\epsilon;\Phi,\tau,\tau^L). \tag{1}$$

Therefore agents compare post-election's value functions, which depend on individual as well as aggregate state variables, and their law of motions or stochastic processes as the case may be.

These functions are RCE's objects since agents need them to take expectations in $S-1$ about the possible taxes the new government may implement.[14] Defining $I^R(a,\epsilon;\Phi,\tau,\tau^R,\tau^L)=1$ whenever (1) is true, and 0 otherwise, the fraction of votes obtained by R can be written as

$$\theta^R(\Phi,\tau,\tau^R,\tau^L)=\int I^R(a,\epsilon;\Phi,\tau,\tau^R,\tau^L)d\Phi \tag{2}$$

which is now a function of aggregate state variables and policy proposals.

The fraction of votes translates imperfectly into the probability of winning the election.[15] This doesn't happen in the median voter model. In that case any deviation by one party from the tax rate preferred by the median generates a discrete drop in the probability of winning from 0.5 to 0, ruling out any equilibrium with different policy proposals. Here I assume that the probability of the R-party winning the election is a strictly increasing function Γ of the fraction of votes θ^R obtained:

$$\Pi(\Phi,\tau,\tau^R,\tau^L)=\Gamma(\theta^R(\Phi,\tau,\tau^R,\tau^L))$$

In particular I use the following exponential function,

$$\Pi(\Phi,\tau,\tau^R,\tau^L)=\frac{1}{1+\exp\left\{-\lambda(\theta^R(\Phi,\tau,\tau^R,\tau^L)-0.5)\right\}}.$$

which facilitates the calibration of the model as it depends only on one parameter $\lambda\geq 0$ and doesn't rule out an equilibrium with proposals converging to the median voter preferences.

Figure 1 depicts the relationship between the fraction of votes obtained by the party and the probability of winning the election, for different values of λ.[16] When λ is small an increase in the fraction of votes has just a small positive effect on the probability of winning. Policy proposals in this case are not very significant defining the outcome of the elections and then they would rather be aimed to make party's voters better off, probably those gaining the most from policies. Hence polarization of preferences have large effects on policies when λ is low. As λ rises the slope of the function increases around θ^P=0.5, making the odds of winning the election more responsive to policies. In the limit, when $\lambda\to\infty$, the probability is zero whenever the fraction of votes is less than 0.5. It jumps to 0.5 when that value is achieved and then jumps to 1 for any value greater

[14] As shown below only a sub-set of taxes may be chosen in equilibrium so, for the RCE it would be enough for them to evaluate those tax rates only. However agents need to evaluate taxes that are not chosen in equilibrium as well to be able to decide their vote.

[15] Electoral uncertainty is common in models of probabilistic voting. For instance candidates may differ in dimensions unrelated to policies and the different valuations of such features by voters may be only partially known (Lindbeck and Weibull, 1987). Alternatively the set of voters may be only a fraction of total citizens, and that fraction may be stochastic (Roemer, 2009).

[16] In analytical work the most common specification would be $\Gamma(\Phi,\tau,\tau^R,\tau^L)=P(\theta^R(\Phi,\tau,\tau^R,\tau^L)+\epsilon>0.5)$, where ϵ is typically uniformly distributed. The quantitative nature of the exercise allows for a more realistic specification.

than 0.5. If this is the case then parties never want to deviate form the median, irrespective from the specification of their objective functions.[17] In this case the median voter result is obtained.

It is left to specify the parties' objective functions. To allow for the possibility of policy proposals that deviate from the preferences of the median voter it is assumed that parties not only care for being in office but for the welfare of their voters as well. Most of the literature assumes that parties maximize the expected average utility of their voters, with the expectation taken with respect to the probability of winning or losing the election. In the quantitative context of this paper that feature would lead parties to focus almost exclusively on richest agents who have much higher utility than poorer agents. To avoid this I consider, as a way of normalization, the relative gains a voter obtains with respect to the policy proposed by the other party as the welfare measure parties care of. Then, defining the consumption equivalent gains from voting for party R as

$$g^R(a,\epsilon;\Phi,\tau,\tau^R,\tau^L)=\left(\frac{V_S(a,\epsilon;\Phi,\tau,\tau^R)}{V_S(a,\epsilon;\Phi,\tau,\tau^L)}\right)^{\frac{1}{1-\sigma}}-1,$$

party's R objective function is

$$\begin{aligned} W(\Phi,\tau,\tau^R,\tau^L) &= \Pi(\Phi,\tau,\tau^R,\tau^L)\ \bar{g}^R(\Phi,\tau,\tau^R,\tau^L) \\ &= \Pi(\Phi,\tau,\tau^R,\tau^L)\frac{\int g^R(a,\epsilon;\Phi,\tau,\tau^R,\tau^L)I^R(a,\epsilon;\Phi,\tau,\tau^R,\tau^L)d\Phi}{\theta^R(\Phi,\tau,\tau^R,\tau^L)}. \end{aligned} \tag{3}$$

so $\bar{g}^R(\Phi,\tau,\tau^R,\tau^L)$ is the average gain of the R voter.

By maximizing the expected gains of those that vote for them, policy proposals don't maximize election probabilities. While a tax close to the median achieves this, the one that maximizes average gains is closer to the preferences of the mean $R-$voter. The chosen tax trade-offs these two effects.[18]

Finally, the problem for party R is to choose τ^R to maximize $W(\Phi,\tau,\tau^R,\tau^L)$, taking τ^L as given. Since everything is symmetric for party L, it faces a similar problem. Defining

$$\begin{aligned} \tau^{R*} &= argmax_{\tau^R}\{W(\Phi,\tau,\tau^R,\tau^{L*})\} \\ \tau^{L*} &= argmax_{\tau^L}\{W(\Phi,\tau,\tau^{R*},\tau^L)\} \end{aligned} \tag{4}$$

the probability distribution for taxes $\pi(\tau^e|\Phi,\tau)$ is the outcome of a Nash-equilibrium between parties R and L, and it is given by

$$\pi(\tau^e|\Phi,\tau)=\begin{cases} \Pi(\Phi,\tau,\tau^{R*},\tau^{L*}) & \text{if} \quad \tau^e=\tau^{R*} \\ 1-\Pi(\Phi,\tau,\tau^{R*},\tau^{L*}) & \text{if} \quad \tau^e=\tau^{L*} \\ 0 & \text{ow} \end{cases} \tag{5}$$

[17] This is true if the proposal doesn't affect directly the utility of voters when losing the election, a common and realistic assumption

[18] It is still the case that if λ is large enough the median voter result obtains since only the effect on the probability will be taken into account by the party when proposing policies.

We can now define the recursive political equilibrium (RPE).

A RPE is a RCE and, in addition, $\pi(\tau^e|\Phi,\tau)$ is defined by (4) and (5).

Political Quasi-Aggregation

Aggregate variables are governed by shocks to taxes and hence the equilibrium is non-stationary. It is well known that under these conditions, under which the wealth distribution becomes a state variable, the exact computation of the model is not feasible. On the economic side agents' knowledge of the entire distribution of assets, and not only of its first moment, is needed to forecast next period aggregate capital. I follow the quasi-aggregation method proposed by Krusell and Smith (1998) reducing the dimensionality to a finite set of moments of the distribution, which are used by agents to forecast next period capital. Let's call this economic quasi-aggregation.

On the political side of the model agents need to know the wealth distribution because it influences the probability distribution of next period taxes. Expression (5) shows that only exists three functions that completely define $\pi(\tau^e|\Phi,\tau)$. These are $\tau^{R*}(\Phi,\tau)$, $\tau^{L*}(\Phi,\tau)$ and $\Pi(\Phi,\tau)$. I implement a political quasi-aggregation in this case, assuming that only a finite set of moments are used by agents to forecast them. Notice that political quasi-aggregation concerns the predictions made by agents about the optimization of political parties, in particular the aggregation in (2) and (3). Parties solve their problem using full-information, but their proposals need to be predicted by agents using partial information.[19] Once this happens economic quasi-aggregation implies that the entire distribution doesn't influence (1). This means that behind the results obtained computing this model agents don't use any information about their exact position on the wealth distribution to push for more or less redistribution.[20]

5 Calibration

The first group of parameters to be calibrated are those that govern the stochastic process for labor efficiency. To calibrate these I match the fraction of wealth and income accrued to each percentile of the corresponding distribution. Figure 2 depicts the results and Table 3 contains the exact numbers. The data is from WID for the year 2020. I include both ex-ante and ex-post income heterogeneity. In the first case I consider ten groups of equal size. The only difference between groups is average efficiency. I impose the same AR(1) process for each of them, which is translated into a discrete one using a grid with 7 possible realizations. Then there are 11 parameters to be set, including average efficiency for 9 groups (the 10th is normalized to obtain unitary average efficiency) and the

[19] The problem of the parties in (3) and the resulting Nash equilibrium described in (4) are solved during simulations for every election period and the realized distribution.

[20] Hence the mechanism is consistent with agents' misperception of actual inequality and their position on the distribution.

common autocorrelation coefficient and innovation variance of the AR(1) processes. Although there are more moments than parameters to match distributions the model makes a good job generating the patterns observed in the data.

Since the motivation for this paper is to explore the macro effects of inequality I also compute the equilibrium for an alternative economy depicting low inequality for comparisons. For this benchmark I use the same procedure to match the income and wealth distributions in the US for the year 1978, which is when, according to the data recorded by WID, the lowest fraction of wealth was accumulated by the top 10 and 1% of the population in the post war period. Again I normalize parameters such that average efficiency is 1, so average efficiency is the same in both economies.[21] As expected, the variance of both ex-ante and ex-post efficiency levels are lower than in the high inequality economy.

The second set of parameters are related to fiscal policy and the political system. I set fiscal policy parameters to obtain the observed effective tax rates (etr) in the US. Using data from the CBO I compute the fraction of disposable income that is paid in taxes minus the fraction received as transfers, for each quintile of the market income distribution.[22] Federal tax payments, mean-tested transfers as well as social insurance payments are considered in the measurement of etrs. The left panel of Figure 4 shows the constructed etrs for 2019, the last year of data availability. The etr goes from -74.2% in the lowest income quintile to -4.6% in the median and 29.3% in the highest quintile. I match these two last numbers. In order to generate these as average etrs I pick a value for $\psi = 0.7$ and parameterize preferences for g such that an average tax rate of 29.6% is obtained as an outcome of the political process. I assume log utility in this case, weighted with a constant equal to 0.51. Figure 4 also shows the average etrs for the rest of the quintiles obtained by simulating the model. These are close to the ones observed in the data although underestimates the net amount received by the first and second quintiles.[23]

Data on etrs can also be used to calibrate λ, which governs the cost in terms of winning probabilities incurred by parties when deviating from median preferences, for a given aggregate state. This parameter greatly influences the volatility of tax rates in the model, which can be also computed using data. Table 4 shows the main statistics of etrs in the US using yearly data from

[21] Tax preferences depend on the size of the tax base, and higher average efficiency would increase it. This potential channel is shut-down by normalizing efficiency. But a similar effect is induced by capital since assets do differ between economies because of different saving decisions.

[22] The data is from "The distribution of Household Income 2019," downloaded from the CBO web page at https://www.cbo.gov/publication/58353.

[23] The model, similarly than in previous work, assumes a unique tax rate and transfer amount for every agent in the economy. Differences in etr only come from differences in income so the model cannot match the actual progressivity of the fiscal system. This can be introduced in the model, but it would complicate its computation as progressivity should be an outcome of the political process as well. By approximating the tax-transfer system by effective tax functions as in Heathcote et al. (2017), introducing pregressivity would require a two-dimensional policy space for parties and voters.

1979 to 2019, the period for which data is available. The first row shows average values for each quintile of market income, while the second one shows the corresponding standard deviation. The first observation is that these rates vary significantly. This is true even for the *etr* paid by the highest quintile, which is arguably mostly independent from economic conditions, since transfers to this group are relatively low.[24] This pattern is in line with Borella et al. (2023), who find very frequent changes in taxes in the US since 1969 which, according to a quantitative analysis, have had dissimilar economic consequences.[25] Because it better captures policy changes I use the volatility of the *etr* paid by the richest quintile, which is 2.6%, as the target to calibrate λ. The calibrated value for this parameter is 250, the largest shown in Figure 1.

It is worth exploring how these rates vary depending on the political party in power. Although I don't use this to calibrate the model, partisan differences in *etr*s are at the core of its main mechanism. The last two rows of Table 4 show the average *etr*s, for each income quintile, for periods when a democrat or a republican president was in power, respectively. There is a significant difference between the two in all of the quintiles, with democratic governments showing higher levels of redistribution than republican governments. Interestingly, this is true in the case of the richest quintile, evidencing a direct partisan effect. In the right panel of Figure 4 I show the time series of the *etr* paid by the richest quintile, with a blue circle marking a year with a democrat government and a red cross a year with a republican government. The partisan effects can be clearly seen. Republican governments start with relatively high *etr*s and finish with relatively low *etr*, with the opposite being true in the case of Democrat governments.

Finally I calibrate the parameters related to preferences and technology. In the first case I use a GHH utility function for consumption and leisure with a coefficient of relative risk aversion of 2, disutility from labor of 12.5 (which match ℓ=0.3 on average) and a Frisch elasticity of labor supply equal to 0.35, respectively. The discount factor is such that the interest rate is on average 3%. In the case of technology I use a 5% depreciation rate and an elasticity of capital of 0.3. A period is one year and $S = 4$.

6 Results

In this section I present the results from solving the model quantitatively. As noted before I do so for two economies, a high inequality (*hi*) economy, calibrated to the income and wealth inequality observed in the US in 2019, and a low inequality (*li*) economy, calibrated to the same distributions but observed in 1978. The aim of the exercise is to compare the results of this two economies to understand the political and macroeconomic consequences of inequality.

[24] Excluding transfers the average *etr* is 32.9% in this group, and its standard deviation 2.5%.

[25] For an empirical relationship between fiscal measures and ideology see Perotti and Kontopoulos (2002) and Müller et al. (2016).

Policy Preferences

The first results relate to policy preferences and how these are affected by inequality. As expected, agents favor higher taxes in the *hi* economy. The tax preferred by the median voter is about 10 points higher, which is similar to the difference between average taxes in the two economies since tax proposals are located at both sides of median voter preferences. This is the result of income and wealth concentration at the top of the distribution, which reduces the tax burden of all of the other groups (including the median) for the same level of total transfers, as well as due to the greater risk agents face in the *hi* economy. The fact that taxes rise with inequality is in line with Downs (1957), Romer (1986) and Meltzer and Richard (1981), but adding the insurance motive as in Corbae et al. (2009).

But our interest is on the distribution of tax preferences. To explore this issue I compute the percentage gains in consumption terms of an increase in taxes for every agent in the economy, starting from the tax rate preferred by the median voter. This is done using $V_S(a, \epsilon; K, \tau, \tau^e)$.[26] Recall that S is the period after the election, when the agents need to evaluate all of the potential policies that may be implemented by the next government. Since V_S is an equilibrium object it depends on the equilibrium path for taxes, so agents are evaluating short-run deviations from equilibrium when assessing the net benefits of different tax rates.

The upper-left panel of figure 5 shows the gains from increasing taxes, ordered into percentiles, for the two economies. By construction, gains are zero for the 50th percentiles. Higher percentiles, those that prefer lower taxes, suffer a net lost from an increase in taxes. This lost differs between economies. In the *hi* economy loses are larger, specially for very high percentiles. The opposite happens in percentiles lying below the median. With the exception of the very low percentiles, those below the 5th, gains from increasing taxes are larger in the *hi* economy. This result is obtained despite the fact that the initial tax rate from which the change is computed is higher in the *hi* economy. When assessing its consequences agents internalize that the distortionary effects of increasing taxes are higher in the *hi* economy. In fact this is behind the opposite pattern observed for the first 5th percentiles. To confirm this, the upper-right panel of figure 5 shows results from the same exercise but starting from the same tax rate in both economies (the average of tax rates preferred by median voters). Now we see that the lowest percentiles also gain more in the *hi* economy, and that welfare effects at the extremes differ in an opposite way in the two economies.

The result is consistent with the evidence pointing to the polarization of policy preferences presented in Table 1. Rising inequality widens the preference gap between those that support and those that oppose redistribution. These preferences are influenced by different factors in the model. The main one comes from the fact that tax preferences are monotonic on income. Then, a higher dispersion of income in the *hi* economy translates directly into a higher dispersion in tax preferences.

[26] Note that K, rather than Φ, appears as a state variable due to quasi-aggregation. Results are shown evaluating V_S in average capital and taxes.

But it may also be the case that the forces behind the median voter result, i.e. larger tax base and higher risk, have an heterogeneous effect on the population. To go deeper in disentangling these alternative explanations the lower-left panel of Figure 5 shows the gains and loses from tax variations as a function of labor efficiency. I only consider agents with zero assets so differences inside each economy are only due to labor income differences.[27] There we can see that, keeping constant labor income, agents favor higher taxes in the *li* economy. Hence, the pattern shown in the upper-left panel is due to higher income dispersion. But this result is influenced by the initial tax used in the exercise. Because the tax rate is higher in the *hi* economy the costs of increasing it are larger. In the lower-right panel of Figure 5 I show the same results but starting from the same tax rate. Now we see that, keeping labor income constant, agents in the *hi* economy prefer higher taxes, with the exception of the very rich that favor lower taxes. Therefore, besides income dispersion, tax preferences become more polarized in the *hi* economy due to additional factors such as a greater tax base and risk.[28]

Politics

Different tax preferences across economies lead to different policy proposals by parties. Since most agents prefer higher tax rates in the *hi* economy parties respond proposing higher taxes on average. But policy preferences are more polarized and voters more divided in the *hi* economy. Since the political structure described in the last section gives parties the incentive to fulfill voters' preferences, and not only to win the election, this polarization translates into more extreme policies, with parties moving further away from median preferences and reducing their probability of election but improving voters' welfare.

Figure 6 shows how this trade-off works. It depicts the fraction of votes θ, the probability of winning Π, voters' average gains $\bar{g}$ and utility W of party L when evaluating different tax rates (in the horizontal axis) after the R party has proposed the tax rate marked with a vertical line, τ^{R*}. The *hi* case is shown in the upper-left panel. Note first that If L proposes the same tax proposed by R then it receives half of the votes and $W = 0$, since there are no relative gains for L voters. But if it moves away from that point, rising its proposal, two things happen. First, there is a discrete jump in votes, accompanied by the consequent jump in winning probabilities. This happens because the R proposal is lower than the tax preferred by the median voter. Second, the average utility of L's voters rises as the L proposal becomes better than the R proposal for a majority of them. These two factors increase party utility and hence it is optimal for L to separate from R. But after the initial jump, votes for L start to decrease as its proposal moves further away from R, due to voters

[27] Due to ex-ante heterogeneity there may be different gains for the same level of efficiency. That's why the lines overlap in ceratin areas.

[28] The tax base effect is not only due to the much higher income of those at the top of the distribution but also because of the larger stock of capital in the *hi* economy caused by precautionary savings, which, as we see below, offsets the distortionary effect of taxes.

that become closer to that party than to L. This lost in votes is compensated by the average gains of L voters that continue to increase. At some point however the voting effect prevails and party utility starts to decrease. Then there is a point where L maximizes utility, which is market with the vertical line τ^{L*} in the graph. The opposite analysis is done for party R, which maximizes its utility when choosing τ^{R*} when L proposes τ^{L*}, so the pair (τ^{R*}, τ^{L*}) is a political equilibrium.

In the upper-right panel of Figure 6 the equilibrium in the *li* economy is shown. The same pattern can be observed. However, compared to the *hi* economy, votes fall more rapidly, because the mass of voters close to the proposals is larger and so it is the mass that switch parties when L moves, and average utility rises more slowly, because there are fewer voters at the extreme benefiting a lot from high tax rates. This implies that proposals are closer to each other in this economy than in the *hi* economy. At the calibrated value of λ the gap in the *hi* economy is 2.3% while in the *li* economy is 1%. To understand the role of λ in the equilibrium the lower-left panel of Figure 6 shows the same objects in the *hi* economy but when rising the value of λ considerably. If R keeps its original proposal the separation of L implies a very large jump in winning probabilities. Then it is optimal for L to separate and propose a larger tax. However, if that were the case, then R would have a probability of winning close to zero, which is clearly not optimal. The equilibrium happens with the two parties proposing a tax that is very close to the one preferred by the median voter. I show this in the lower-right panel of Figure 6. In this case there is no jump in votes when L separates from R and the fall in votes when doing so translates into a fall in the probability of winning that is so large that L doesn't want to separate too much from R. The gap between R and L proposals is very close to zero. Figure 7 shows how this gap depends on λ more generally. It plots the difference between tax proposals and the tax preferred by the median voter in both economies as a function of this parameter. The gap in the *hi* economy is always greater than the one in the *li* economy, and both decrease monotonically with λ. This is the model counterpart to the empirical findings in tables 1 and 2, which show how inequality polarize party proposals and increase partisan differences in transfers and taxes, respectively.

Figure 8 shows policy proposals by parties as functions of actual taxes (upper panel) and aggregate capital (lower panel). As expected, tax proposals are higher in the *hi* economy due to the greater support coming from greater net transfers for most of the population and more idiosyncratic risk. To better see how proposals depend on the aggregate states in the center graphs I show the difference between proposals and the average tax rate. Proposals are mostly independent from the actual tax (upper panel). The political process doesn't smooth taxes. Indeed proposals seem to be decreasing in the tax rate in place before the election. In the case of capital (lower panel) a clearer relationship is observed. Proposals rise with capital because the tax base increases and then, for a given tax rate, more revenues are obtained. This is true in the two economies and for the two parties. The gaps between parties, shown in the right panel, are mostly flat with respect to taxes (upper panel) and capital (lower panel).

Macroeconomics

Similarly to most of political economy models linking inequality and redistribution, more inequality translates into higher taxes, affecting investment and labor supply. But unlike models where policies are set according to median voter preferences, in this model politics additionally produce business cycles. Because each party proposes different tax rates and each of them have positive probabilities to be elected, the existence of policy switches generates movements in macroeconomic aggregates. Since, as we have seen, inequality influences the distance between the tax proposals made by parties, policy switches and their aggregate effects vary across economies.

Table 5 reports mean and standard deviations of the main aggregate variables and prices in the *hi* and *li* economies, after simulating them for a long period of time. The first column shows tax rates. The average levels are consistent with preferences; the mean tax rate in the *hi* economy is 28% and in the *li* economy is 19%. Lower taxes in the *li* economy spurs labor supply and investment. This effect is counteracted by precautionary motives due to higher risk in the *hi* economy, both idiosyncratic and aggregate, with the last one coming from greater tax volatility. This last effect is greater in the case of savings, resulting in a greater stock of capital of about 2.3% in the *hi* economy. The distortionary effect of taxes prevails in the case of labor supply, which is 7.5% greater in the *li* economy, and on output, which is 4.6% greater in that economy. Consumption is also larger in the *li* economy (6.4%), and so it is the average ratio of consumption to GDP (about 1.5% of GDP) which is pushed up by uncertainty in the *hi* economy. Wages are slightly higher, and the gross interest rate slightly lower, in the *hi* economy.

Taxes are more volatile in the high-inequality economy, consistently with the results presented in the last subsection. The standard deviation is 1.3%, compared to the 0.6% obtained in the *li* economy. This translates into higher volatility of all the macro variables and prices. For instance, the standard deviation of output is 0.5% in the high-inequality economy, which compares to a 0.2% observed in the *li* economy. Differences in the dispersion of labor, capital, consumption and prices are similar, with standard deviations that are twice as much or more in the *hi* relative to the *li* economy.

Volatility is not only explained by the ex-post effect of tax changes. In the model agents face uncertainty with respect to future policies since parties alternate in power stochastically. The macroeconomic effects of uncertainty has been well explored. Closely to the mechanism in this paper, Canes-Wrone and Park (2012), Julio and Yook (2012) and Julio (2016) have empirically found drops in different economic variables around elections, arguing that the effect is explained by political uncertainty. The novelty of the model presented in this paper regarding this channel is that its magnitude depends on inequality. In a more unequal economy the distance between tax proposals widens, increasing uncertainty and therefore its effects on agents' decisions and macroeconomic variables. Aguirre (2023) finds empirical evidence on this in a panel of mostly developed economies and, for a longer period of time, in the US.

Figure 9 reports the path for consumption, savings and output between elections, for the *hi* and *li* economies. It shows the percentage change of each variable with respect to the first period that a government is in power $s = 1$. Recall that elections occur at the end of period $s = 3$. On the left panel we can see that consumption falls continuously before an election in the two economies, but the drop is larger in the high-inequality economy. This result is in line with a precautionary behavior by agents facing uncertainty about taxes and transfers. In the center panel we can see the opposite pattern for savings. This is the counterpart of the fall in consumption due to the higher uncertainty agents face in the *hi* economy. There is a fall in output (right panel) because investment before elections is too low to sustain it. The results for consumption and output are qualitatively consistent with the empirical findings in Aguirre (2023), where they fall before an election, in a magnitude that is increasing in the initial level of inequality. The behaviour of savings differ from the empirical estimations though, since empirically investment falls before the election as well. Notice however that in the model there is no mechanism generating a negative effect of uncertainty on investment, a feature extensively explored by previous literature (Cukierman, 1980; Bernanke, 1983; Rodrik, 1991; Bloom, 2009). The lack of such a mechanism also affects the magnitude of the results, specially in the absence of frictions linking demand shocks to output. However, although the magnitude of the effect is small relative to its empirical counterpart, the pattern is consistent with a role of precautionary savings in the relationship between inequality and the macroeconomy, something that, beyond variations around elections, affects the level of macroeconomic aggregates on average, as seen above.[29]

7 Conclusions

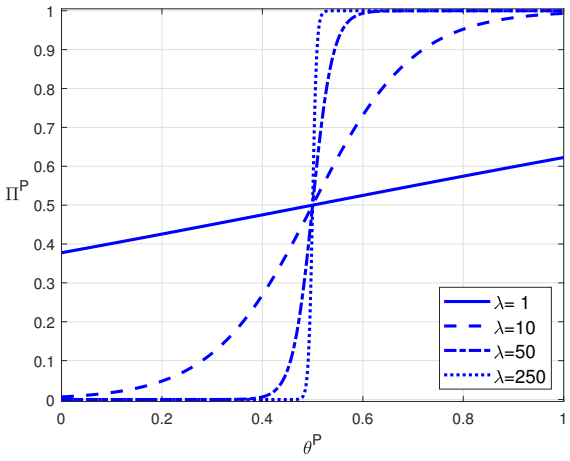
This paper builds a model of heterogenous agents, incomplete markets and idiosyncratic shocks extended with a political mechanism that deviates from the commonly used median voter result. On the economic dimension the model allows for a rich heterogeneity in terms of income and wealth. On the political side it allows for realistic party competition. Economic heterogeneity generates disperse preferences over policies, to which parties endogenously respond proposing tax rates that deviate from the levels preferred by the median voter, but maintaining positive election probabilities. This structure leads to tax, and hence macroeconomic fluctuations, in magnitudes that are contingent on the distribution of income and wealth. The model is solved using political quasi-aggregation, and it can be extended to analyze different policies and institutional settings.

I use the model to show the political and macroeconomic effects of inequality. To do this I compare the results of two different calibrations corresponding to a high and a low inequality economies. Results show more disperse preferences and more extreme policy proposals in the high

[29] Another feature that is absent from the model is the inclusion of liquid and illiquid savings, which gives rise to wealthy hand to mouth agents who react more strongly to uncertainty shocks, as in Kaplan and Violante (2014) and Bayer et al. (2019).

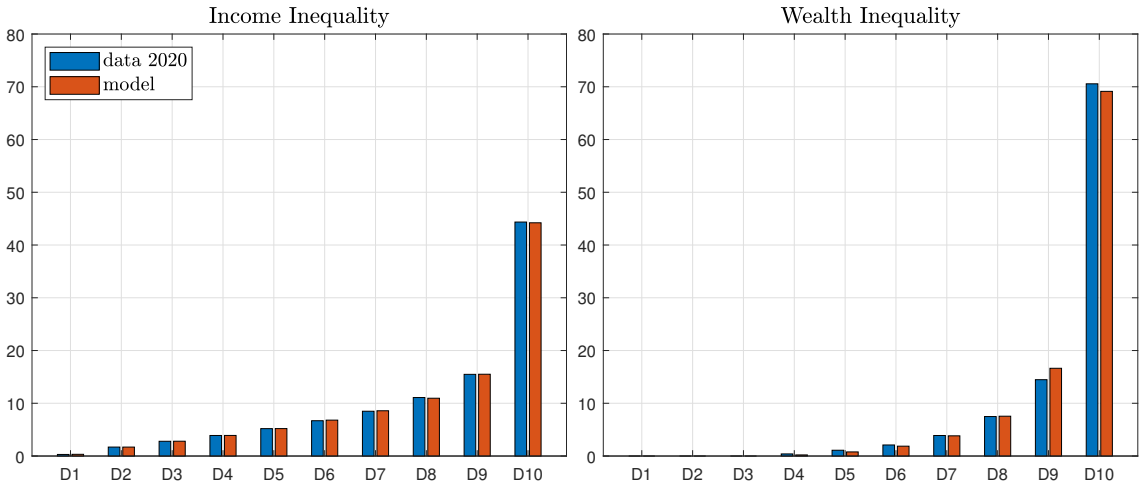
inequality economy. This is, inequality leads to higher degrees of political polarization and to larger swings in policies. This in turn affects the economy. I show that the high inequality economy is more volatile and suffers more considerably from policy uncertainty, with negative macroeconomic effects.

Figures



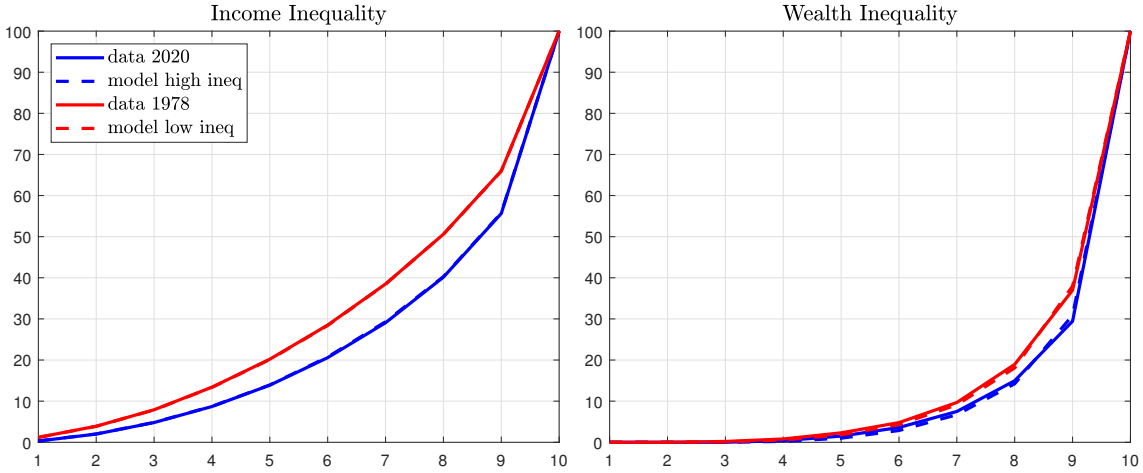
Note: Function Γ, which maps the fraction of votes obtained by a party θ^P and the probability of winning an election Π^P, for different vales of λ.

Figure 1: Function Γ: Votes and Probability of Winning



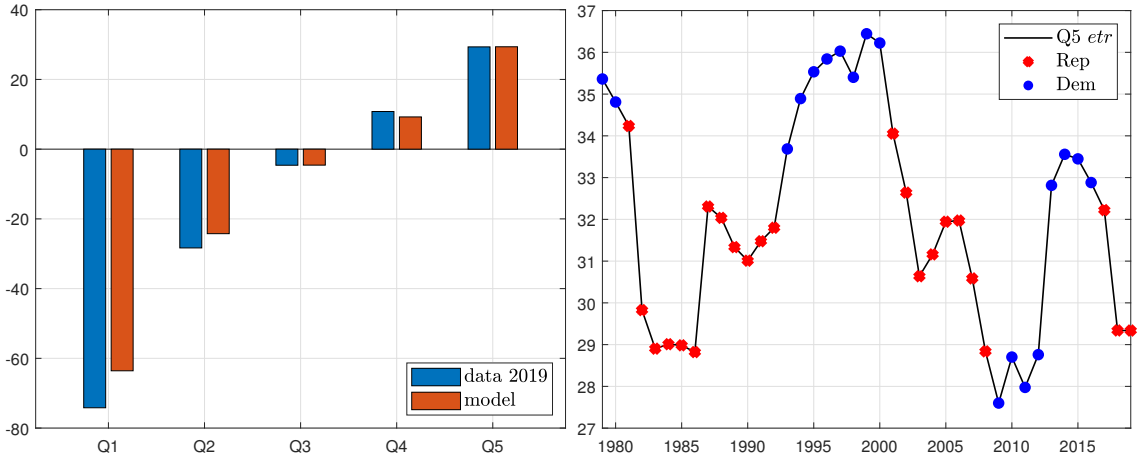
Note: Fraction of total income (left) and wealth (right) accumulated by each decile of the corresponding distribution in the data for 2020 (blue) and the model (red).

Figure 2: Calibration: Income and Wealth Distribution



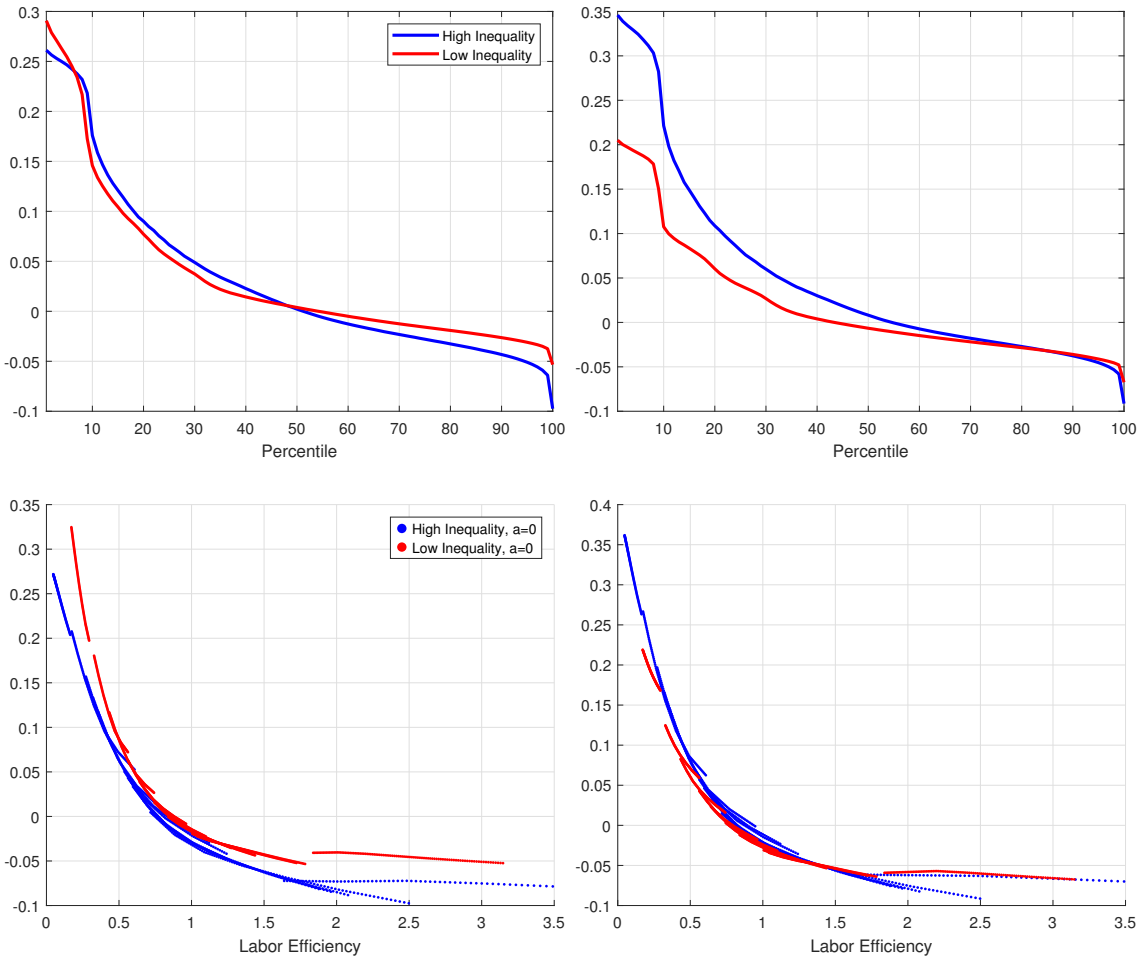
Note: Lorenz curves for income (left) and wealth (right), comparing data for 2020 and the high-inequality model economy (blue) and data for 1978 and the low-inequality model economy (red).

Figure 3: Calibration: Income and Wealth Distribution, Hi and Low Inequality



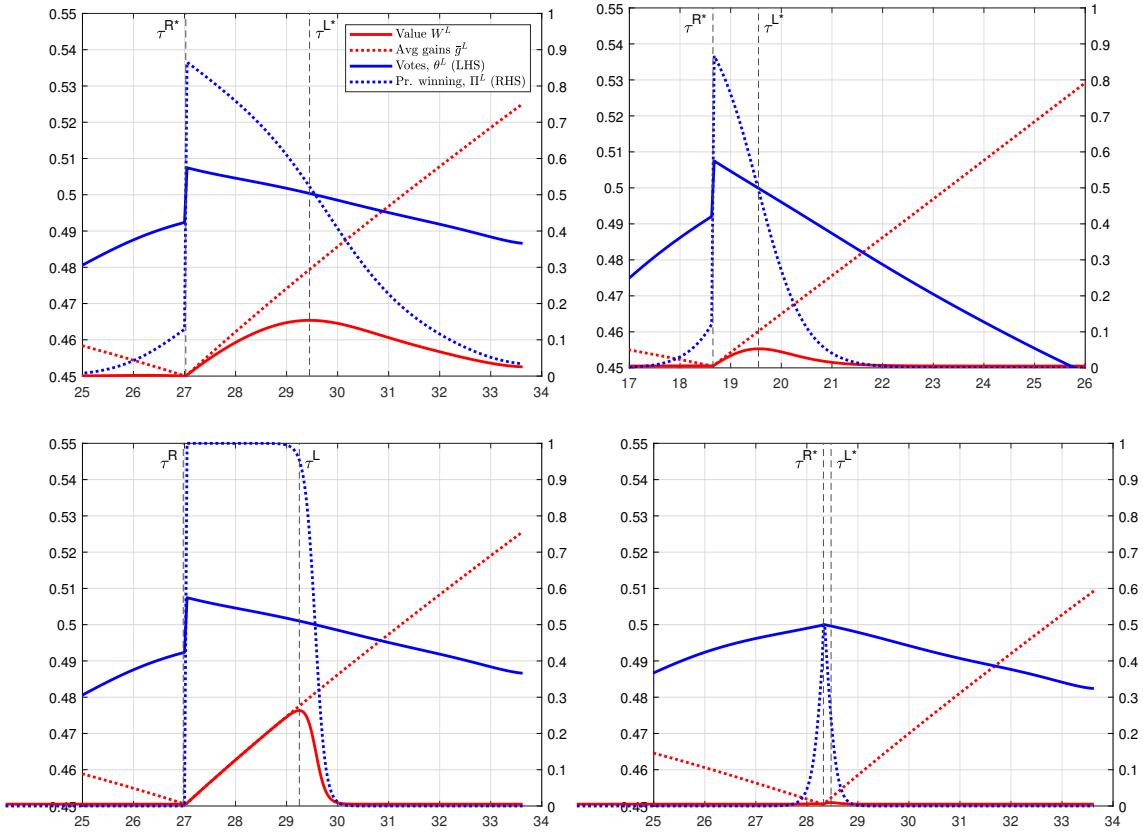
Note: Effective tax rates *etr* are the fraction of disposable income that is paid in taxes minus the fraction received as transfers. Data is computed from the statistics published by the CBO. Left: for each quintile of the market income distribution (data in 2019). Right: time series of the *etr* paid by the richest quintile. Red (blue) points are years with a Republican (Democrat) government.

Figure 4: Calibration: Effective Tax Rates



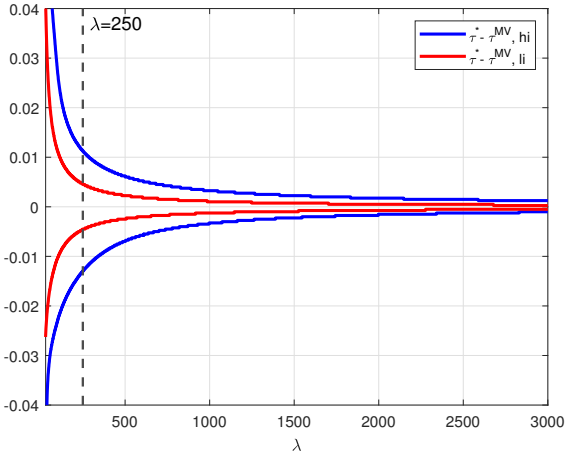
Note: Welfare gains or loses in consumption equivalents from an increase in taxes, for the high inequality (blue) and low inequality (red) economies. Upper panel: gains ordered in percentiles. Lower panel: gains for each level of labor efficiency, considering only agents with zero assets. Left: change in the tax rate starting from the level preferred by the median voter in each economy. Right: change starting from the same tax rate (average between the two taxes preferred by median voters).

Figure 5: Policy Preferences



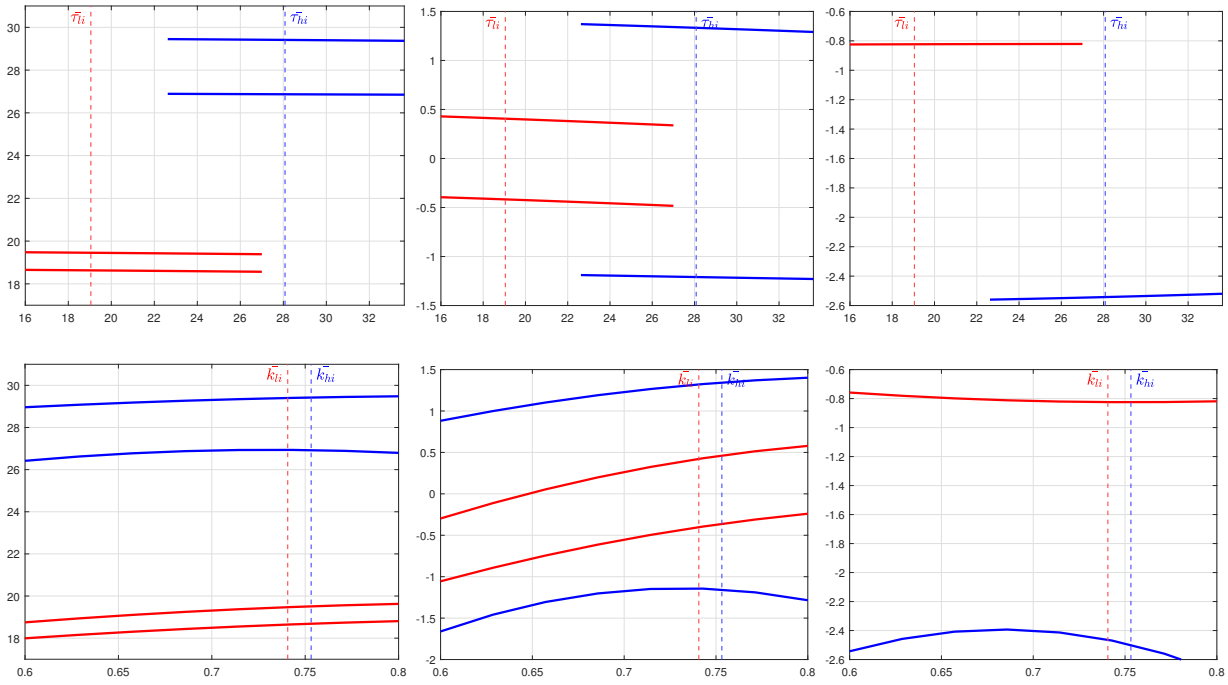
Note: Utility of the party W, voters' aggregate gains $\bar{g}$, fraction of votes θ and winning probability Π of L when R proposes the tax rate marked with the vertical line τ_R^*. Upper-left is the equilibrium in the hi economy and upper-right the equilibrium in the li economy. The lower panel shows results when λ is increased considerably. The lower-left panel show the case when the proposal by R is the equilibrium one under $\lambda = 250$. The lower-right panel shows the equilibrium proposals. All results are evaluated at the average levels of capital and taxes for the corresponding economy.

Figure 6: Best Responses and Political Equilibrium



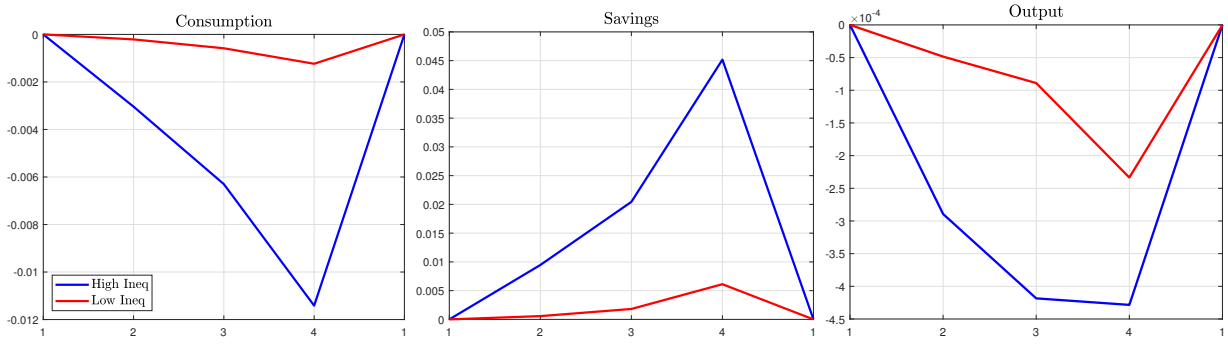
Note: Differences between proposals and the tax preferred by the median voter as a function of λ.

Figure 7: Gaps in Proposals and λ



Note: Left: tax proposals by the R party τ^{R*} and the L party τ^{L*} in the hi (blue) and li (red) economies, as a function of actual taxes (upper panel) and aggregate capital (lower panel). Center: same series normalized by average taxes. Right: difference between proposals. Vertical lines mark the average tax rate (upper panel) and average capital (lower panel).

Figure 8: Policy Proposals



Note: average value of consumption (left), savings (center) and output (right) for periods $s = 1, 2, 3, 4$, where elections occur at the beginning of $s = 4$. Results from simulation of the hi (blue) and li (red) economies.

Figure 9: Macroeconomic Effects of Elections

Tables

	Voters (World Value Survey)						Parties (Manifesto)		
	Country−Wave Average		Country−Wave St Dev		Country−Wave % Extremes		Diff. Positions Right-Left (AV)		
	Pref. for Redist.	Left Right	Pref. for Redist.	Left Right	Pref. for Redist.	Left Right	Social	Market Economy	Welfare
Gini Index	−0.15	0.15	4.35^{***}	1.31^{***}	1.01^{**}	0.49^{**}	13.78	-25.55^{*}	30.97^{**}
	−0.04	0.14	4.05	4.1	2.36	2.35	0.48	−1.7	2.51
R^2	23	45	26	21	17	12	2	8	13
Countries	35	35	35	35	35	34	51	51	51
Observations	123	103	123	103	123	124	481	481	481

Note: Fixed and time effects included in all specifications. The unemployment rate is included as a control in voters' polarization specifications. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

Table 1: Inequality and Polarization: Panel Estimations

	Public Transfers (% of avg income)		Tax Revenues (% of GDP)	
	(1)	(2)	(3)	(4)
Lag. Dep. Var.	0.31^{*}	0.30^{*}	0.79^{***}	0.79^{***}
	1.87	1.79	27.3	25.78
Party in Power $\{-1, 0, 1\}$	-0.20	0.83	0.03	-0.02
	-1.06	0.59	0.27	-0.04
Party in Power $\{-1, 0, 1\} \times$ Gini $[0, 1]$		-10.7^{**}		-2.49^{***}
		-2.34		-3.2
Gini $[0, 1]$		-3.95		-1.45
		-0.34		-0.65
R^2	91	92	79	79
Countries	23	23	43	43
Observations	254	254	900	900

Note: Fixed and time effects included in all specifications, as well as the unemployment rate, output gap and country specific time trends. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

Table 2: Inequality and Policy Divergence: Panel Estimations

	Income Distrubution					Wealth Distrubution			
	Data 2020	Model High Ineq	Data 1978	Model Low Ineq		Data 2020	Model High Ineq	Data 1978	Model Low Ineq
Q1	0.3	0.3	1.2	1.2	Q1	0.0	0.0	0.0	0.0
Q2	1.7	1.7	2.7	2.7	Q2	0.0	0.0	0.0	0.0
Q3	2.8	2.8	4.0	4.0	Q3	0.0	0.0	0.2	0.1
Q4	3.9	3.9	5.5	5.5	Q4	0.4	0.2	0.6	0.5
Q5	5.2	5.2	6.8	6.8	Q5	1.1	0.8	1.5	1.2
Q6	6.7	6.8	8.3	8.3	Q6	2.1	1.9	2.5	2.5
Q7	8.5	8.6	10.0	10.0	Q7	3.9	3.8	4.9	4.8
Q8	11.1	11.0	12.1	12.2	Q8	7.5	7.5	9.3	9.0
Q9	15.5	15.5	15.4	15.3	Q9	14.5	16.6	18.0	19.9
Q10	44.4	44.2	34.0	34.1	Q10	70.6	69.1	63.0	62.0

Note: Fraction of total income (left) and wealth (right) accumulated by each decile of the corresponding distribution, comparing data for 2020 and the high-inequality model economy and data for 1978 and the low-inequality model economy.

Table 3: Calibration: Income and Wealth Distribution

	Q1	Q2	Q3	Q4	Q5
Mean	-71.5	-17.6	6.1	18.1	32.0
SD	3.6	9.2	7.6	4.8	2.6
Mean Dem gov	-72.5	-20.2	4.8	17.4	33.3
Mean Rep gov	-70.6	-15.6	7.2	18.7	31.0

Note: Effective tax rates *etr* are the fraction of disposable income that is paid in taxes minus the fraction received as transfers. Data is computed from the statistics published by the CBO.

Table 4: Calibration: Effective Tax Rates (*etr*), Main Statistics

		τ	Y	N	K	C	w	r
High-Inequality Economy	Mean	28 %	0.17	0.24	0.76	0.13	0.46	2.9 %
	St. Dev.	1.3 %	0.5 %	0.6 %	0.8 %	0.4 %	0.3 %	0.05 %
Low-Inequality Economy	Mean	19 %	0.18	0.26	0.74	0.14	0.46	2.9 %
	St. Dev.	0.6 %	0.2 %	0.3 %	0.4 %	0.2 %	0.1 %	0.02 %

Table 5: Macroeconomic Statistics

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