Available online at www.sciencedirect.com
SCIENCE DIRECT
ELSEVIER
Journal of Monetary Economics 52 (2005) 1227–1244
Journal of MONETARY ECONOMICS
www.elsevier.com/locate/jme

Corruption, inequality, and fairness ☆

Alberto Alesina[a,b,c], George-Marios Angeletos[d,e,*]

[a] *Harvard University, USA*
[b] *NBER, USA*
[c] *CEPR, UK*
[d] *NBER, USA*
[e] *Department of Economics, MIT, 50 Memorial Drive, E52-251, Cambridge, MA 02142, USA*

Received 26 February 2005; accepted 25 May 2005
Available online 6 October 2005

Abstract

Bigger governments raise the possibilities for corruption; more corruption may in turn raise the support for redistributive policies that intend to correct the inequality and injustice generated by corruption. We formalize these insights in a simple dynamic model. A positive feedback from past to current levels of taxation and corruption arises either when wealth originating in corruption and rent seeking is considered unfair, or when the ability to engage in corruption is unevenly distributed in the population. This feedback introduces persistence in the size of the government and the levels of corruption and inequality. Multiple steady states exist in some cases.

JEL classification: D31; E62; H2; P16

Keywords: Corruption; Rent seeking; Inequality; Fairness; Redistribution; Political economy

1. Introduction

Market economies generate large differences in income and wealth. The poor are always likely to demand redistributive policies, but have a much stronger moral justification for

☆ We are grateful to Robert King (the editor), an anonymous referee, Marco Bassetto and Rafael Di Tella for detailed comments and feedback. We also thank Vasia Panousi and Janina Matzuseski for excellent research assistance and Emily Gallagher for excellent editorial assistance.

*Corresponding author. Department of Economics, MIT, 50 Memorial Drive, E52-251, Cambridge, MA 02142, USA. Tel.: +1 617 452 3859.
E-mail address: angelet@mit.edu (G.-M. Angeletos).

0304-3932/$ - see front matter
doi:10.1016/j.jmoneco.2005.05.003

doing so when inequality stems from corruption and rent seeking. Yet, often these same measures that are intended to correct the effect of unfair inequality—such as progressive income taxation, extensive regulation, and large public projects—create more scope for corruption and rent seeking. Think, for example, of tax loopholes, corruption in the allocation of public projects, or regulations justified on the basis of the greater good but tailored to the interest of particular lobbies. What is more, those who benefit from corruption may prefer higher taxation and more regulation, not for the sake of the poor, but because bigger governments increase the rents they can extract. As a result, high levels of government intervention, corruption, and rent seeking may be self-sustaining.

We formalize these insights in a simple dynamic model based on three key ideas. The first is that bigger governments increase the private gains from corruption, lobbying, and other forms of rent seeking. The second is that the distribution of these gains is uneven in the population. The third is that societies consider inequality originating in corruption and rent seeking more unfair than inequality originating from productive effort and market competition.

Our main result is that the combination of the first ingredient with *either* of the other two ingredients introduces a complementarity between current and past politico-economic outcomes—there can exist multiple steady states in the level of inequality, redistribution, and corruption.

The first building block of our model is that the larger the resources controlled by the government, or the more extensive the regulation of the market, the larger the scope for corruption and rent seeking. While we model corruption strictly as private appropriation of tax revenues outside the law (i.e., outside of sanctioned redistributive schemes), we intend to capture a broader set of activities that favor various groups of privileged insiders, these would include industrialists receiving favorable regulations, public employees receiving high salaries, job security and perks, certain localities being favored by political entrepreneurs, and so on.[1] The second ingredient is also quite plausible: not all individuals have the same political connections, access to the bureaucracy, or moral hesitation in becoming corrupt. More novel is the third element, the concern for fairness.

In our model, individual income originates from two sources: a standard productive activity, and a non-market, rent-seeking activity. Inequality generated by the productive activity is considered fair; inequality generated by the rent-seeking activity is unfair. Ceteris paribus, the optimal level of redistribution increases with the ratio of unfair to fair inequality.[2]

This concept of fairness, which we introduced in Alesina and Angeletos (2005), is supported by a variety of experimental and empirical evidence that shows that people are more willing to accept inequality of outcomes generated by what is perceived as effort or ability than luck or connections.[3] Using the World Values Survey, Alesina et al. (2001b) and Alesina and Angeletos (2005) find that countries or individuals who believe that wealth and success are mostly the outcome of "luck and connections" rather than of hard

[1]For a discussion of the use of public employment for patronage and redistribution, see Alesina et al. (2000) for US cities, and Alesina et al. (2001a) for Italian regions.

[2]Along with this altruistic motive for redistribution, there is a standard selfish motive as in Meltzer and Richard (1981).

[3]For a review of relevant experimental evidence on fairness, see Fehr and Schmidt (2001); see also Alesina and Angeletos (2005, Section 2).

work and effort tend to prefer more leftist policies. Alesina and La Ferrara (2005) find a similar pattern using the General Social Survey for the United States.

In the presence of such a fairness concern, a history of big governments and extensive corruption means that wealth distribution is rather ''unfair'' in the present, which in turn implies stronger support for redistribution for any given level of inequality. But even when there is no fairness concern, if the gains from corruption are unevenly distributed in the population, a history of bigger governments and higher levels of corruption in the past implies a higher overall level of inequality in the present, which in turn may raise the support for redistribution. In either case, multiplicity relies on the endogeneity of corruption: if the size of the government did not affect the scope for corruption, the steady state would have been unique.

The two steady states can easily be ranked in terms of aggregate income, which is higher in the low-tax steady state, but cannot be Pareto ranked. First, individuals who have a sufficiently high advantage in rent seeking prefer the regime with the bigger government. Second, the poor benefit from redistribution and may therefore prefer the high-tax steady state even at the cost of more government resources dissipated by corruption. This effect may underlay the political economy of various populist regimes in Latin America, which are supported by a prima-facie paradoxical coalition between the poor, who benefit from redistribution, and rich insiders, who benefit from corruption.[4]

These points are consistent with Glaeser and Shleifer (2003), who view the rise of the regulatory state in the United States as a response to the ''wild capitalism'' and the ''robber barons'' of the late nineteenth century (Josephson, 1934). For some the American regulatory state had gone too far, becoming a source of favoritisms and capture (Stigler, 1971). Focusing on developing countries, Di Tella and Mc Culloch (2003) argue that people who perceive corruption as a major problem vote for left-wing parties which favor policies that intend to tax the corrupt capitalists. Djaonkv et al. (2002) similarly find that regulation of entry is more intrusive in countries where corruption is higher. Finally, using a variety of historical and current examples, Rajan and Zingales (2002) show how a perception that capitalism is corrupt undermines market reform and supports heavy interventionism. Our interpretation of these facts is that government intervention is often invoked in an attempt to fight social injustices, but also that government intervention fosters corruption and injustice. Welfare programs in developing countries often do not reach the poor and instead create a vast array of favored groups.

The idea that corruption is a by-product of government activities that are motivated by benevolent goals—in our case reducing income inequality—is best formalized in Banerjee (1997), who explicitly models bureaucracy and corruption. We instead take the usual shortcut of modeling corruption as a simple rent-seeking activity.[5]

Multiple equilibria (or steady states) in the level of redistribution appear also in Piketty (1995) and Benabou and Tirole (2005). The multiplicity there is due to distortions in beliefs about the sources of inequality, whereas in our model beliefs perfectly reflect the truth; moreover, neither of these papers examines the role of corruption. Andvig and Moene (1991) and Johnson et al. (1997) obtain multiple equilibria in the level of corruption or tax evasion, but the source of multiplicity is again very different. In Andvig and Moene (1991), the complementarity originates in the interaction between the profitability of corruption

[4]For a related discussion of populism in Latin America, see Dornbusch and Edwards (1991).

[5]See, for example, Baumol (1990), Murphy et al. (1993), and Angeletos and Kollintzas (1999).

and the number of corrupt officials; in Johnson et al. (1997), multiplicity emerges because the larger the unofficial sector, the smaller the tax base, the lower the amount of public goods provided by the government to the official sector, and hence the lower the incentive of firms to operate in the official sector.

The rest of the paper is organized as follows. Section 2 introduces the model. Section 3 examines the interaction between past and current politico-economic outcomes. Section 4 characterizes the equilibrium policy for a given history. Section 5 analyzes the steady state(s). Section 6 further discusses the implications of our results and Section 7 concludes. All proofs are in the Appendix.

2. The model

We consider a non-overlapping-generations model. Each generation consists of a large number of agents (a measure-one mass, indexed by i and distributed uniformly over $[0,1]$). Agents live only for one period and are connected to past and future generations via intergenerational wealth transfers and parental investment (bequests, education, status, etc.). During their lives, agents engage in two types of economic activity: a productive activity (work, invest, etc.) and a rent-seeking one (corruption, lobbying etc.). Preferences for redistribution originate from two sources: a selfish motive and an altruistic demand for fairness.

Production and corruption. Wealth net of taxes, transfers, and rent seeking is the product of innate ability, effort, and parental investment. For agent i in generation t, this is given by

$$w_{it} = A_{it}e_{it} + k_{it-1}, \tag{1}$$

where A_{it} denotes the agent's innate ability, e_{it} denotes his effort, and k_{it-1} his parents' investment or bequest.

We let redistribution be the only reason for the existence of a government. Following Romer (1975) and Meltzer and Richard (1981), we assume that the government imposes a flat tax on individual wealth in order to finance a lump-sum transfer across all agents (or some sort of redistributive public good). Unlike earlier work, however, we introduce corruption by letting a fraction of government resources be up for grabs.

In particular, denoting with G_t the size of the government in period t, R_t the resources that are up for grabs, and T_t the resources that remain for lump-sum redistribution, we let

$$T_t = (1-\phi)G_t \quad \text{and} \quad R_t = \phi G_t, \tag{2}$$

where $\phi \in [0,1]$ parametrizes the extent of corruption.[6] R_t in turn is split among the agents on the basis of their rent-seeking activity: agent i receives a portion z_{it}/Z_t of the total pie,

$$r_{it} = \frac{z_{it}}{Z_t}R_t, \tag{3}$$

where Z_t is the aggregate, and z_{it} is his own, level of rent seeking. The latter is given by $z_{it} = B_{it}x_{it}$, where x_{it} is the effort agent i allocates to rent seeking and B_{it} is his efficiency in corruption (the extent of his political connections, his negotiation power vis-à-vis

[6] Olken (2003) collected data on a redistributive program for rice in Indonesian villages and found that between 20% and 40% of the rice collected for redistribution disappeared in the process, obviously stolen by various village administrators and their friends.

bureaucrats, or his indifference towards the ethics of his business life). Note that rent seeking is a zero-sum game: it affects only the distribution of the pie that is up for grabs, not its size.

Disposable wealth is then given by the sum of after-tax wealth, lump-sum transfers from the government, and proceeds from rent seeking:

$$y_{it} = (1 - \tau_t)w_{it} + T_t + r_{it}. \tag{4}$$

This is spent on private consumption, which we denote with c_{it}, and parental investment, k_{it}. The agent's budget is thus

$$c_{it} + k_{it} = y_{it}. \tag{5}$$

The government budget, on the other hand, is given by

$$G_t = \lambda\tau_t W_t + (1 - \lambda)\tau_{t-1} W_{t-1}, \tag{6}$$

where W_t is aggregate wealth in period t, τ_t is the tax rate in that period, and $\lambda \in [0, 1]$. We allow $\lambda < 1$ for various reasons. First, this captures the idea that the size of the government and the pie that is up for grabs in one period is not a function of contemporaneous tax revenues alone.[7] Second, we could interpret $\lambda < 1$ as a time-to-build assumption: welfare programs and other redistributive schemes set in place by one generation partly extend to future generations. Finally, and most importantly, λ parametrizes the extent to which generation t internalizes the effect that bigger governments lead to more corruption: the higher λ, the higher the same-period increase in corruption that results from a given increase in tax revenues.

Individual preferences. Agents' preferences are given by

$$U_{it} = u_{it} - \gamma_{it}\Omega_t, \tag{7}$$

where u_{it} measures the private utility from own consumption, bequests, and effort choices, and Ω_t represents a common disutility generated by unfair social outcomes (to be defined below). The parameter γ_{it} measures the strength of the demand for fairness and is allowed to differ across individuals.[8]

For tractability, we assume quadratic effort costs and a Cobb–Douglas aggregator over consumption and bequests:

$$u_{it} = u(c_{it}, k_{it}, e_{it}, x_{it}) = \frac{1}{(1-\delta)^{1-\delta}\delta^{\delta}}(c_{it})^{1-\delta}(k_{it})^{\delta} - \frac{1}{2}[(e_{it})^2 + (x_{it})^2], \tag{8}$$

where $\delta \in (0, 1)$. The first term represents the utility from own consumption and bequests, the second the disutility of effort. The Cobb–Douglas specification implies that optimal consumption and parental investment satisfy

$$c_{it} = (1 - \delta)y_{it} \quad \text{and} \quad k_{it} = \delta y_{it}, \tag{9}$$

so that δ represents the fraction of wealth allocated to parental investment (equivalently, the strength of intergenerational linkages).

[7] Note that, as long as we focus on steady states, (6) is equivalent to the more general specification $G_t = \sum_{j=0}^{\infty} \lambda_j \tau_{t+j} W_{t+j}$, with $\lambda_0 = \lambda$ and $\sum_{j=1}^{\infty} \lambda_j = 1 - \lambda$.

[8] An interesting possibility is that γ_{it} is inversely related to B_{it}, in which case individuals who are most proficient at being corrupt are also those least offended by it.

Fairness. The concept of fairness we adopt is based upon the distinction between two types of inequality: "justifiable" inequality induced by variation in talent and effort, and "unjustifiable" inequality induced by variation in corruption and rent seeking.

Since wealth is transmitted from one generation to another through parental investment, we need to keep track of this distinction along each agent's entire family tree. We assume that parental investment is considered fair only to the extent that it reflects income from effort and talent—not income from corruption and rent seeking. We thus define the fair levels of consumption, bequests, and wealth as

$$\hat{c}_{it} = (1-\delta)\hat{y}_{it}, \quad \hat{k}_{it} = \delta\hat{y}_{it} \quad \text{and} \quad \hat{y}_{it} = \hat{w}_{it} = A_{it}e_{it} + \hat{k}_{it-1}. \tag{10}$$

(Throughout, fair levels are indicated by a hat.) Our measure of social injustice is then the average distance between actual and fair utilities:

$$\Omega_t = \int_i (u_{it} - \hat{u}_{it})^2, \tag{11}$$

where $u_{it} = u(c_{it}, k_{it}, e_i, x_i)$ and $\hat{u}_{it} = u(\hat{c}_{it}, \hat{k}_{it}, e_i, x_i)$.[9]

By conditions (8) and (9), utility is quasi-linear in disposable wealth, implying that $u_{it} - \hat{u}_{it} = y_{it} - \hat{y}_{it}$ for all i and therefore $\Omega_t = \int_i (y_{it} - \hat{y}_{it})^2$. As we will see later in more detail, $\hat{y}_{it}$ reflects the cumulative contribution of talent and effort throughout the individual's family history, while y_{it} also includes the cumulative contribution of corruption and rent seeking. Ω_t thus takes into account the intergenerational propagation of unjustifiable income.

The political process. We assume an unstructured model of political choice which is represented by the maximization of the following social welfare function:

$$\mathscr{U}_t = \int U_{it}\, \mathrm{d}\pi_i. \tag{12}$$

$\pi : [0,1] \to [0,1]$ is a probability measure capturing the distribution of political power. When π_i assigns measure one to the median of the population, this specification essentially nests the median-voter paradigm. When instead π_i is the identity function, the policy maximizes utility behind the veil of ignorance. Alternatively, π_i may assign more weight to the rich or the agents with political connections (i.e., agents with relatively high B_{it}).

Equilibrium. Let $\alpha_{it} \equiv A_{it}^2$ and $\beta_{it} \equiv B_{it}^2$. To simplify, we assume that $(\alpha_{it}, \beta_{it})$ are independent of each other and that $(\alpha_{it}, \beta_{it}, \gamma_{it})$ are i.i.d. across agents but fully persistent over time. A "dynasty" is thus identified with a particular draw $(\alpha_i, \beta_i, \gamma_i)$. Finally, for any parameter $\theta \in \{\alpha, \beta, \gamma\}$, we let $\bar{\theta} = \int \theta_i\, \mathrm{d}i$ and $\tilde{\theta} = \int \theta_i\, \mathrm{d}\pi_i$ denote the simple and politically weighted population averages, $\Delta_\theta = \bar{\theta} - \tilde{\theta}$ the distance between the two, and $\sigma_\theta^2 = Var(\theta_i)$ the variance in the cross-section of the population. We will see that a sufficient statistic for the characteristics of the economy turns out to be the parameter vector

$$\mathscr{E} = (\phi, \tilde{\gamma}, \Delta_\alpha, \Delta_\beta, \sigma_\alpha, \sigma_\beta; \bar{\alpha}, \bar{\beta}, \tilde{\alpha}, \tilde{\beta}, \delta).$$

Δ_α and Δ_β play a role similar to the gap between the median and the mean of the wealth distribution in Meltzer and Richard (1981). σ_α and σ_β, on the other hand, parametrize the exogenous variation in the fair and unfair sources of wealth, respectively, and affect outcomes only when there is a demand for fairness ($\tilde{\gamma} > 0$). We finally define

[9] An alternative definition of fair utility that gives similar results is $\hat{u}_{it} = u(\hat{c}_{it}, \hat{k}_{it}, e_i, 0)$.

Definition. An equilibrium for economy $\mathscr{E}$ is a sequence of policies $\{\tau_t, G_t\}_{t=0}^{\infty}$ and allocations $\{(e_{it}, x_{it}, c_{it}, k_{it})_{i\in[0,1]}\}_{t=0}^{\infty}$ such that:

(i) Given policy (τ_t, G_t) and endowment k_{it-1}, the bundle $(e_{it}, x_{it}, c_{it}, k_{it}, y_{it})$ maximizes U_{it} subject to (1) and (4)–(5), for all i and t.
(ii) Given history of policies and allocations $\{\tau_s, G_s, (e_{is}, x_{is}, c_{is}, k_{is})_{i\in[0,1]}\}_{s=0}^{t-1}$, the policy (τ_t, G_t) in period t maximizes (12), for all t.

3. The interaction of corruption, inequality, and fairness

We start by analyzing how inequality, fairness, and corruption affect optimal policy choices and how policies in turn affect the equilibrium levels of inequality, fairness, and corruption.

Using Eqs. (4) and (10), the gap between actual and fair income can be decomposed into four terms:

$$y_{it} - \hat{y}_{it} = (1 - \tau_t)(w_{it} - \hat{w}_{it}) - \tau_t \hat{w}_{it} + G_t + (r_{it} - R_t). \tag{13}$$

The first term implies that a higher tax rate corrects more for the unfairness generated by unjustifiable inherited wealth, whereas the second term implies that a higher tax rate also deprives the individual of some of her fair wealth. Therefore, to the extent that $w_{it-1} \neq \hat{w}_{it-1}$ for a positive measure of agents, society faces a trade-off in choosing the size of the government that is optimal from a fairness perspective. The last term, on the other hand, captures the net gain or loss of the agent from his participation in the zero-sum game of corruption, which also depends on the size of the government.

The trade-off introduced by fairness becomes clear once we use (13) to express Ω_t as a weighted average of the variance decomposition of wealth inequality:

$$\Omega_t = \tau_t^2\, Var(\hat{w}_{it}) + (1 - \tau_t)^2\, Var(w_{it} - \hat{w}_{it}) + Var(r_{it}) + cov\, s_t, \tag{14}$$

where $Var(.)$ denotes variance in the cross-section of agents and $cov\, s_t$ includes constants and covariance terms (see Appendix for the derivation and the exact formula). When $(\tau_t, G_t) = 0$, the above reduces to $\Omega_t = Var(w_{it} - \hat{w}_{it})$, thus measuring how unfair the wealth distribution would be in the absence of government intervention; when instead $(\tau_t, G_t) > 0$, the above incorporates the effect of redistribution and corruption.

To gain further intuition, ignore for a moment the covariance terms in Eq. (14) and suppose that minimizing Ω_t is the only policy goal, taxation is not distortionary, and the wealth distribution is exogenous. The optimal tax rate is then given by

$$\frac{1 - \tau}{\tau} = \frac{Var(\hat{w}_{it})}{Var(w_{it} - \hat{w}_{it})}. \tag{15}$$

The right-hand side represents the *signal-to-noise ratio* in the wealth distribution: the signal is the fair component of wealth, the cumulative effect of talent and effort; the noise is the unfair component, the cumulative effect of corruption and rent seeking. The optimal tax rate is decreasing in this signal-to-noise ratio, reflecting the desire to correct for the inequality generated by corruption.

The wealth distribution, however, is endogenous in equilibrium; as we show next, the signal-to-noise ratio itself depends on current and past tax policies.

Consider the equilibrium allocations for a given policy. Household i in generation t is born with a given k_{it-1} and chooses $(c_t^i, k_t^i, e_t^i, x_t^i)$ so as to maximize his utility subject to his budget constraint, taking (τ_t, G_t) and Ω_t as given. The optimal levels of consumption and parental investment are given by condition (9). Utility then reduces to $u_{it} = y_{it} - e_{it}^2/2 - x_{it}^2/2$, implying that the optimal levels of effort devoted to production and rent seeking are, respectively,

$$e_{it} = (1-\tau_t)A_{it} \quad \text{and} \quad x_{it} = B_{it}\phi G_t / Z_t. \tag{16}$$

The equilibrium level of corruption is thus increasing in the fraction of government resources up for grabs:

$$Z_t = \sqrt{\bar{\beta}\phi G_t}. \tag{17}$$

Combining (16) and (17), we infer that

$$A_{it}e_{it} = (1-\tau_t)\alpha_{it} \quad \text{and} \quad r_{it} = (\beta_{it}/\bar{\beta})\phi G_t. \tag{18}$$

To simplify the notation, we henceforth normalize $\bar{\beta} = 1$.

Let $\bar{\tau}_s^t \equiv 1 - \prod_{j=s}^t (1-\tau_j)$ denote the cumulative rate of taxation between periods s and t, with the convention $\bar{\tau}_s^t = 0$ when $s > t$. As we show in the Appendix, iterating on (1), (4), and (9) implies that, in equilibrium, actual wealth is $w_{it} = A_{it}e_{it} + k_{it-1}$, with

$$k_{it-1} = \sum_{s \leqslant t-1} \delta^{t-s}(1-\bar{\tau}_{s+1}^{t-1})[(1-\tau_s)A_{is}e_{is} + G_s + (r_{is} - R_s)]. \tag{19}$$

In contrast, fair wealth is $\hat{w}_{it} = A_{it}e_{it} + \hat{k}_{it-1}$, with

$$\hat{k}_{it-1} = \sum_{s \leqslant t-1} \delta^{t-s} A_{it}e_{it}. \tag{20}$$

Combining the above with (18), we infer that heterogeneity in A_{it} generates variation in the fair level of wealth (the signal $\hat{w}_{it}$), whereas heterogeneity in B_{it} generates variation in the unfair component of wealth (the noise $w_{it} - \hat{w}_{it}$).

The relative contribution of the two types of inequality depends on past policies: the period-t equilibrium signal-to-noise ratio reduces to

$$\frac{Var(\hat{w}_{it})}{Var(w_{it} - \hat{w}_{it})} = \frac{[\sum_{s \leqslant t} \delta^{t-s}(1-\tau_s)]^2 \sigma_\alpha^2}{[\sum_{s \leqslant t-1} \delta^{t-s}\bar{\tau}_s^{t-1}(1-\tau_s)]^2\sigma_\alpha^2 + [\sum_{s \leqslant t-1} \delta^{t-s}(1-\bar{\tau}_{s+1}^{t-1})(\phi G_s)]^2 \sigma_\beta^2}, \tag{21}$$

where $\sigma_\alpha^2 = Var(\alpha_i)$, $\sigma_\beta^2 = Var(\beta_i)$, and $(\alpha_i, \beta_i) \equiv (A_i^2, B_i^2)$. This ratio tends to decrease with G_s for every $s \leqslant t-1$, because a history of big governments means that corruption has played a major role in shaping the wealth distribution. The impact of τ_s, on the other hand, is generally non-monotonic. When there has been no corruption in the past, a higher tax in the past means a less fair wealth distribution today; but when there has been corruption in the *distant* past, a higher tax in the *more recent* past may have already corrected for the unfairness of the earlier corruption. Notwithstanding the latter effect, a society that has a history of high-tax distortions, big governments, and pervasive corruption will tend to inherit an unfair wealth distribution, which in turn may raise the "altruistic" demand for redistribution in the present.

Moreover, if the variation in rent-seeking abilities across the population (σ_β) is high, an economy with a history of high taxation and high corruption may also inherit a high overall level of inequality. This may raise the "selfish" demand for redistribution.

We conclude that the interaction of corruption with either the fairness concern or the selfish motive introduces a complementarity between past and current political choices: the equilibrium tax today may be an increasing function of the tax yesterday.

4. Equilibrium policy

In this section we characterize the equilibrium policy τ_t for a given history $\{\tau_s\}_{s\leqslant t-1}$. We focus on stationary histories and begin by examining how a particular individual ranks different policy alternatives in equilibrium.

Proposition 1. *Suppose $\tau_s = \tau \in [0,1]$ for all $s<t$. The utility of agent i in period t is*

$$U_{it} = V(\tau_t, \tau; \alpha_i, \beta_i) - \gamma_i \Omega(\tau_t, \tau), \tag{22}$$

where

$$\begin{aligned} V(\tau_t, \tau; \alpha, \beta) \equiv & -\left[\frac{1}{2}\alpha\tau_t^2 + \frac{1}{2}\beta\phi G_t(\tau_t, \tau) + \frac{1-\lambda}{\lambda} G(\tau_t, \tau)\right] + \tau_t(1-\tau_t)(\bar{\alpha}-\alpha) \\ & + \tau_t \tfrac{\delta}{1-\delta(1-\tau)}[(1-\tau)^2(\bar{\alpha}-\alpha) + \phi G(\tau,\tau)(1-\beta)] \\ & + \phi G(\tau_t, \tau)(\beta_i - 1), \end{aligned} \tag{23}$$

$$\begin{aligned} \Omega(\tau_t, \tau) \equiv & \left[-\tau_t(1-\tau_t) + (1-\tau_t)\frac{\delta(1-\tau)^2}{1-\delta(1-\tau)} - \frac{\delta(1-\tau)}{1-\delta}\right]^2 \sigma_\alpha^2 \\ & + \left[G(\tau_t,\tau) + (1-\tau_t)\frac{\delta}{1-\delta(1-\tau)} G(\tau,\tau)\right]^2 \phi^2 \sigma_\beta^2 \\ & + \left[\frac{1-\lambda}{(1-\delta)\lambda}(G(\tau_t,\tau) - G(\tau,\tau))\right]^2, \end{aligned} \tag{24}$$

$$G(\tau_t, \tau) \equiv \frac{1}{1-\delta}[\lambda\tau_t(1-(1-\delta)\tau_t - \delta\tau) + (1-\lambda)\tau(1-\tau)]\bar{\alpha}. \tag{25}$$

This defines i's preferences over τ_t; the expressions in Eqs. (22)–(25) are complicated, but their interpretation is simple.

Condition (24) gives the equilibrium level of social injustice. The first term represents the injustice generated when a positive tax reallocates income from more worthy (i.e., more talented, hard-working) to less worthy agents. This term is positive only if $\sigma_\alpha > 0$, that is, only if there is justifiable inequality. The second term represents the injustice generated by corruption and rent seeking. This term is positive only if $\phi > 0$ and $\sigma_\beta > 0$, that is, only if there is corruption and unjustifiable inequality. Moreover, this term is non-monotonic in τ_t: a bigger government corrects more for the corruption in the past but also opens the door to more corruption today. Both terms depend on the past level of τ, as the size of the government in the past has determined the distribution of k_{it-1} inherited today.[10]

[10] The last term in Eq. (24) measures $Y - \hat{Y}$ (see the Appendix).

Condition (23), on the other hand, gives the private utility an agent enjoys from his effort choices and wealth. The first term represents the distortionary costs of taxation and corruption; the second and third terms capture the redistribution of contemporaneous income and inherited bequests; the last term is the net transfer enjoyed from rent-seeking activity.

Finally, condition (25) gives the equilibrium size of the government. When $\delta = 0$ and $\lambda = 1$, in which case the model reduces to a static economy, (25) reduces to $G_t = \tau_t(1 - \tau_t)$. More generally, (25) exhibits the usual Laffer-curve effect: at very high levels of taxation, a further increase in τ_t distorts incentives and reduces income so much that tax revenues fall. At the same time, G_t is a decreasing function of τ, for higher tax distortions in the past imply less aggregate income in the past and therefore a lower tax base in the present.

Consider now how τ_t is chosen in equilibrium. By (22), individual utilities are linear in individual characteristics $(\alpha_i, \beta_i, \gamma_i)$. The policy objective thus reduces to

$$\mathcal{U}_t = \int u_i \, \mathrm{d}\pi_i = V(\tau_t, \tau; \tilde{\alpha}, \tilde{\beta}) - \tilde{\gamma}\Omega(\tau_t, \tau);$$

and since τ_t maximizes $\mathcal{U}_t$, we have the following result.[11]

Proposition 2. *Suppose $\tau_s = \tau$ for all $s < t$. The equilibrium policy in period t is $\tau_t = F(\tau; \mathscr{E})$, where*

$$F(\tau; \mathscr{E}) \equiv \arg \max_{\tau' \in [0,1]} \{V(\tau', \tau; \tilde{\alpha}, \tilde{\beta}) - \tilde{\gamma}\Omega(\tau', \tau)\}. \tag{26}$$

5. Multiple steady states

The mapping F in (26) represents the best response of generation t to a stationary history. A steady state is any fixed point of this mapping, that is, any τ^* such that $\tau^* = F(\tau^*; \mathscr{E})$.

In order to gain intuition into the steady-state properties of the model, consider first $\phi = \tilde{\gamma} = 0$, that is, disregard both corruption and fairness. To simplify, let also $\lambda = 1$. The mapping F then reduces to

$$\tau_t = F(\tau) = \frac{\Delta_\alpha + \delta(1-\tau)^2/(1-\delta(1-\tau))\Delta_\alpha}{\bar{\alpha} + \Delta_\alpha}, \tag{27}$$

where, recall, $\Delta_\alpha \equiv \bar{\alpha} - \tilde{\alpha}$. When $\delta = 0$, meaning that there are no intergenerational links, the above gives $\tau_t = \Delta_\alpha/(\bar{\alpha} + \Delta_\alpha)$. This result is identical to that in Meltzer and Richard (1981): the optimal tax rate is increasing in Δ_α, which can be interpreted as the distance between the mean and the median of the population. When $\delta > 0$, the additional term $[\delta(1-\tau)^2/1 - \delta(1-\tau)]\Delta_\alpha$ reflects the gain from redistributing inheritances: the higher the distance between the mean and the median inheritance, the higher the gain from redistribution for the median agent.

In the absence of corruption, a higher level of redistribution in the past implies less inequality in inheritances and therefore a lower gain from redistribution today. The

[11] Note that policy preferences in any given period depend only on realized past policies, not expectations about future policies. This is due to the warm-glow specification of intergenerational altruism and rules out any form of strategic interaction across generations.

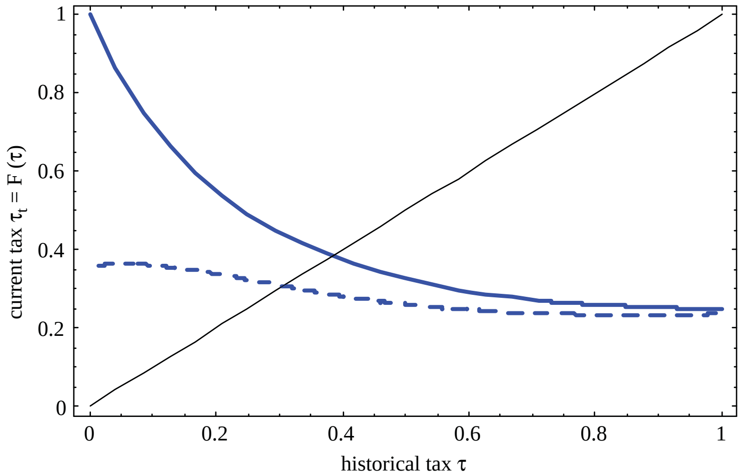

Fig. 1. The standard Meltzer–Richard effect—unique steady state in the absence of corruption.

optimal τ_t in (27) decreases with τ and F intersects the 45-degree line only once, as illustrated by the solid line in Fig. 1.[12] This ensures that the steady state is unique.

If we allow for a fairness concern ($\tilde{\gamma} > 0$) but continue to assume no corruption ($\phi = 0$), the optimal level of redistribution is zero from a fairness perspective. The Meltzer–Richard effect, however, kicks in as long as $\Delta_\alpha > 0$. All that fairness then does is to increase the cost of taxation, as a higher tax increases the gap between fair and actual outcomes. The F curve thus shifts down, and the optimal tax is lower than when $\tilde{\gamma} = 0$, as illustrated by the dotted line in Fig. 1. Nevertheless, the steady state remains unique.

Consider next the impact of corruption ($\phi > 0$) in the absence of a fairness concern ($\tilde{\gamma} = 0$). Also let $\Delta_\alpha = 0$ and $\Delta_\beta > 0$, that is, disregard the usual Meltzer–Richard effect but allow for "skewness" in the distribution of rent-seeking abilities. This introduces a novel motive for redistribution. If the size of the government in the past is large, then the income from corruption and rent seeking in the past is also high. With $\Delta_\beta > 0 = \Delta_\alpha$, this implies that the "median" of the income distribution in the present is poorer than the mean, not because his parents have been less productive, but because his parents have been less effective in rent seeking. Hence, inequality originating in corruption in the past creates support for redistribution in the present. But as the optimal size of the government today is positive, the level of corruption today is also positive, which tends to make high levels of government and corruption self-sustaining.

On the other hand, if a society starts with a history of no (or small) government and no (low) corruption, there is no corruption-born inequality in the present, which together with the fact that there is no (low) standard Meltzer–Richard effect implies that the optimal size of government in the present is zero (small). We conclude that multiple levels of corruption and redistribution can be self-sustained even in the absence of any concern for fairness. Such a situation is illustrated by the solid line in Fig. 2: there are two stable steady states, one with $\tau = 0$ and another with $\tau > 0$, as well as an intermediate unstable one, which we disregard.

[12] All numerical examples are only illustrative.

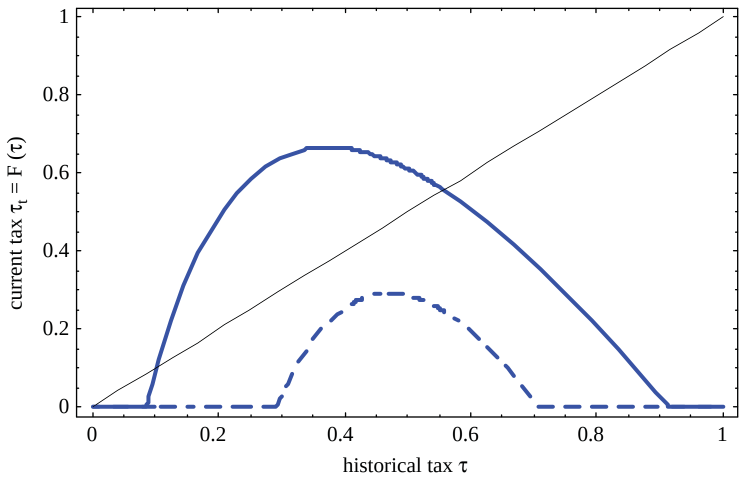

Fig. 2. Self-sustained corruption—multiple steady states in the absence of both the standard Meltzer–Richard effect and the concern for fairness.

The coefficient λ now plays an important role. The dotted line in Fig. 2 illustrates the impact of an increase in λ: once λ is sufficiently high, the multiplicity of steady states may disappear. This is because the attempt to redistribute from the high-β individuals to the low-β ones becomes self-defeating when λ is very high, as then a large fraction of the tax revenue is up for grabs by the very same high-β individuals whom taxation is supposed to target. In other words, the higher λ is, the more the current generation internalizes the effect that an increase in taxation and redistribution leads to an increase in corruption.

Finally, consider the interaction of corruption and fairness ($\phi > 0$ and $\tilde{\gamma} > 0$). To make the argument sharper, let $\Delta_\alpha = \Delta_\beta = 0$. If $\tilde{\gamma}$ were zero, taxation would have only costs and no benefits, so that $\tau_t = 0$ would be both the unique equilibrium and the unique steady state. When $\tilde{\gamma} > 0$, $F(0) = 0$ and $\tau = 0$ remains a steady state: a history of no taxation and no government means also a history of no corruption, so that the wealth distribution is fair and there is no need to redistribute for fairness reasons.

If, however, the economy inherits a history of high taxes and big governments, this means also a history in which corruption has played some role in determining the wealth distribution, in which case there is necessarily a desire to redistribute. It is then possible that, together with $\tau = 0$, there also exists a steady state in which $\tau > 0$. Such a possibility is illustrated by the solid line in Fig. 3. The two extreme intersection points of F with the 45-degree line identify the two locally stable steady states. The lower one corresponds to $\tau = 0$, $Z = 0$, and $\Omega = 0$ (low taxation, low corruption, and fair outcomes), the higher one to $\tau > 0, Z > 0$, and $\Omega > 0$ (high taxation, high corruption, and unfair outcomes).

The impact of λ is similar as in the earlier case of self-sustained corruption. As illustrated by the dotted line in Fig. 3, an increase in λ reduces the incentive to redistribute and limits the possibility of multiple steady states. The only difference is that taxation now becomes self-defeating, not because it increases the resources that are up for grabs by high-β individuals, but rather because it increases the inequality induced by corruption.

In the examples depicted in Figs. 2 and 3, the lower steady state has a zero tax rate: if there has been no taxation and no corruption in the past, no taxation is optimal today as

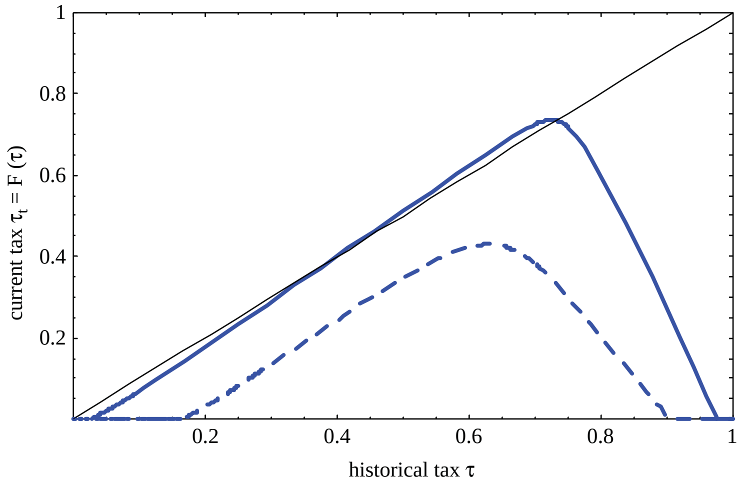

Fig. 3. The effect of fairness—multiple steady states in the absence of any self-motivated redistribution.

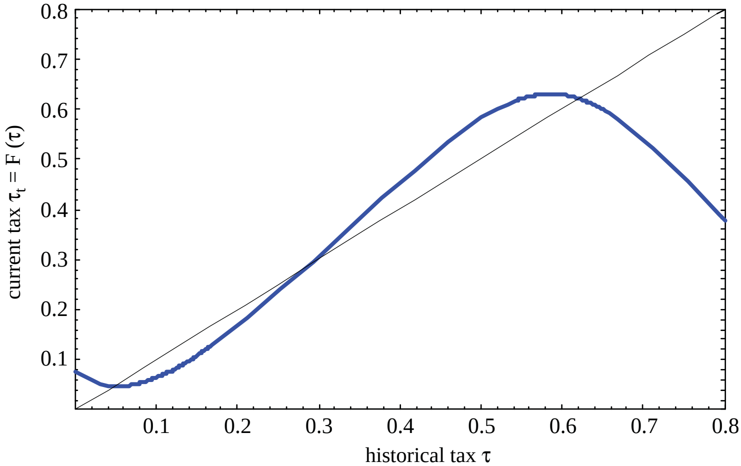

Fig. 4. The effect of fairness combined with the Meltzer–Richard effect—multiple steady states.

well. This is an artifact, however, of the absence of any other motive for taxation. If instead there were some exogenous amount of government spending to be financed, the lower steady state could have a positive tax rate. The same is true if fairness interacts with self-motivated redistribution (that is, if we combine $\tilde{\gamma}, \sigma_\alpha, \sigma_\beta > 0$ with $\Delta_\alpha > 0$). This case is illustrated by Fig. 4.

Summarizing the above analysis, we have the main result of the paper.

Proposition 3. *A steady state for economy $\mathscr{E}$ is any fixed point $\tau^* = F(\tau^*, \mathscr{E})$. If there is no room for corruption ($\phi = 0$), there exists a unique steady state. If instead there is room for corruption ($\phi > 0$) coupled with either skewness in rent-seeking abilities ($\Delta_\beta > 0$) or a demand for fairness ($\tilde{\gamma} > 0$), there robustly exist multiple steady states.*

6. Discussion

i. When there is no corruption, the steady state is unique, as in Meltzer and Richard (1981). In this case, a demand for fairness affects the level but not the determinacy of the steady state—it merely introduces a trade-off between the private good of redistribution from the rich to the poor and the public good of fairness.

ii. When there is corruption, we may have a complementarity between past and current policies for two reasons: either because more corruption in the past means more inequality in the present, or because more corruption in the past means more unfairness in the present. Either one may lead to multiple steady states—or, more generally, to persistence in politico-economic outcomes.

iii. We could easily recast our main result in a static (one-generation) economy as multiple self-fulfilling equilibria. We chose to focus on the dynamic version merely to emphasize the role of history. Different regimes are explained by different historical experiences, not different self-fulfilling expectations.

iv. A theoretical prediction shared by many models of redistribution is that more inequality leads to more redistribution. There is plenty of evidence, however, that this prediction is rejected by the data.[13] Our model may help explain this puzzle in two ways. First, an economy with less inequality may have more redistribution because more of that inequality is due to corruption and is thus considered unfair, or because there is a stronger demand for fairness; in this case, the missing variable is the level of corruption or the strength of concerns for fairness. Second, an economy with less inequality may have more redistribution because it rests in a "higher" steady state; in this case, the missing variable is history.

v. A strong correlation displayed by the data is that corruption decreases with income per capita (e.g., Mauro, 1995; Knack and Keefer, 1995). One could interpret these data in the context of our model as suggesting that ϕ is higher in poorer countries. An alternative interpretation is that poverty and corruption are both endogenous. In this case, certain countries may be stuck in a corruption-induced poverty trap. Note that poorer countries tend to have smaller governments as measured by the ratio of government spending over GDP; yet, government intrusiveness in the economy rely also on regulations and other various sources of intervention that go beyond the share of spending over GDP and that tend to be higher in poorer economies.[14]

vi. When there are multiple steady states, the one with bigger government (higher τ) is inferior in the sense that fewer resources are devoted to productive activities, while more resources are wasted in the zero-sum game of rent seeking. However, in general, the two steady states cannot be Pareto ranked for two reasons. First, those who are especially productive in rent seeking may prefer the high corruption regime. Second, the poor may prefer a high level of redistribution even at the cost of high corruption. An interesting possibility is then that a large corrupt government may draw support from an unlikely coalition of the very poor and the rich insiders. This is a coalition of those who benefit

[13] See for example Perotti (1996). Alesina and Glaeser (2004) document in detail that there are both more pre-tax inequality and less redistribution in the United States than in continental Europe. Di Tella and Mc Culloch (2003) similarly find that more inequality often leads to the election of right-wing governments.

[14] Needless to say, there are many reasons—unrelated to the story highlighted in this paper—that explain the growth of government as a function of per capita income. For a survey of the literature of the size of the government, see Mueller (2003).

from high redistribution per se and those who are hurt by taxation per se but are close to the levers of power. This seems a pretty accurate description of several populist governments in Latin America, as emphasized for instance by Dornbusch and Edwards (1991).

vii. Fairness can be lower in the steady state with bigger government, for a larger proportion on wealth can then be due to corruption. So, paradoxically, the attempt to correct the impact of corruption and increase fairness may sustain a steady state which is less fair. This is the sort of paradox emphasized by Di Tella and Mc Culloch (2003) when they ask, "why doesn't capitalism flow to poor countries?" The answer that our paper proposes is that the perception that capitalism is corrupt and that government intervention is necessary can be self-sustaining; quite unfortunately, attempts to reduce unfairness often result, not only in higher efficiency losses, but also in more corruption and less fair outcomes.

7. Concluding remarks

The main message of our analysis is that redistributive and regulatory policies intended to reduce inequality or improve the fairness of economic outcomes may bring about even more opportunities for corruption. This creates a policy dilemma: a small government does not correct enough for market inequalities and injustices; a large government increases corruption and rent-seeking.

Many policy-makers and observers appear to be aware of this trade-off. Especially in developing countries, public spending toward the poor is often mis-targeted and creates pockets of corruption and favoritism; and often certain lobbies come out as big winners at the expense of the truly needy. Nevertheless, even well-intended policy-makers would resist calls for cutting these programs because they perceive the cost of corruption as worth paying—this is often the only way to at least partially improve the condition of the poor.

What is perhaps less understood is that the willingness to accommodate some corruption in the present may lead to a vicious cycle where high levels of government intervention, market inefficiency, and corruption are self-sustained in perpetuity. The failure to internalize this intergenerational externality can jeopardize the long-run effectiveness of well-intended policies.

Appendix

Proof of Condition (14). From the familiar result that $\mathrm{E}(X^2) = (\mathrm{E}X)^2 + Var(X)$, we have $\Omega_t = \int_i (y_{it} - \hat{y}_{it})^2 = (Y - \hat{Y})^2 + Var(y_{it} - \hat{y}_{it})$, where $Y - \hat{Y} = \int_i (y_{it} - \hat{y}_{it})$. By the assumption that α_{it} and β_{it} are independent, $Cov(\hat{w}_{it}, r_{it}) = 0$. (13) thus implies

$$\begin{aligned} Var(y_{it} - \hat{y}_{it}) &= (1 - \tau_t)^2\, Var(w_{it} - \hat{w}_{it}) + \tau_t^2\, Var(\hat{w}_{it}) + Var(r_{it}) \\ &\quad + 2(1 - \tau_t)\tau_t\, Cov(\hat{w}_{it}, w_{it} - \hat{w}_{it}) + 2(1 - \tau_t)\, Cov(r_{it}, w_{it} - \hat{w}_{it}). \end{aligned}$$

Combining the above and letting $cov\,s_t = (Y - \hat{Y})^2 + 2(1 - \tau_t)\tau_t\, Cov(\hat{w}_{it}, w_{it} - \hat{w}_{it}) + 2(1 - \tau_t)\, Cov(r_{it}, w_{it} - \hat{w}_{it})$ proves (14). $\square$

Proof of Conditions (19), (18), and (21). To simplify notation, let $q_t \equiv \delta(1-\tau_t)$, $Q_t^t = 1, Q_s^t \equiv \prod_{j=s+1}^t q_j$ for $s \leqslant t-1$, $\pi_t \equiv \delta[(1-\tau_t)A_t e_t + T_t + r_t]$, and drop the index i. Note that $q_t \in (0,1)$ and therefore $Q_s^t \in (0,1)$ as well. We can then write $k_t = \delta y_t = q_t k_{t-1} + \pi_t$ and therefore $k_t = \sum_{s \leqslant t} Q_s^t \pi_s$. Combining the latter with $Q_s^t = \delta^{t-s}(1-\bar{\tau}_{s+1}^t)$ and $\pi_s = \delta[(1-\tau_s)A_s e_s + T_s + r_s]$, using $T_s = G_s - R_t$, and expressing the result for $t-1$ instead of t, gives (19).

Next, by (16), $z_{it} = B_{it}x_{it} = (B_{it}^2/Z_t)R_t = (B_{it}^2/Z_t)\phi G_t$. By implication, the equilibrium level of corruption satisfies $Z_t = \int_i z_{it} = \int_i B_{it}x_{it} = \int_i B_{it}^2 \phi G_t / Z_t$. Solving for Z_t gives (17) and combining this with (16) gives the second part of (18).

Finally, from (19), (20), and (18), the assumption that $\alpha_{it} = \alpha_i$ and $\beta_{it} = \beta_i$ for all t, and the normalization $\bar{\beta} = 1$, we have

$$w_{it} - \hat{w}_{it} = \sum_{s \leqslant t-1} \delta^{t-s}\{-\bar{\tau}_s^{t-1}(1-\tau_s)\alpha_i + (1-\bar{\tau}_{s+1}^{t-1})(G_s + (\beta_i - 1)\phi G_s)\},$$

$$\hat{w}_{it} = \sum_{s \leqslant t} \delta^{t-s}(1-\tau_s)\alpha_i.$$

Calculating the variances gives (21). □

Proof of Proposition 1. Consider a stationary history, $\tau_s = \tau$ for all $s \leqslant t-1$, in which case we also have $\bar{\tau}_s^t = 1-(1-\tau)^{t-s+1}$ and $G_s = G$, $W_s = W$, $Y_s = Y$, $K_s = K$, for all $s \leqslant t-1$. To compute the stationary levels G, W, Y, and K, note that $Y = \int_i y_i = (1-\tau)W + G$, which together with $G = \lambda\tau W + (1-\lambda)\tau W = \tau W$ gives $Y = W$, and therefore $K = \int k_i = \delta Y = \delta W$. Combining this with $W = \int_i (A_{is}e_{is} + k_{is-1}) = (1-\tau)\bar{\alpha} + K$ gives $W = 1/(1-\delta)(1-\tau)\bar{\alpha}$, and therefore $G = 1/(1-\delta)\tau(1-\tau)\bar{\alpha}$ and $K = \sigma/(1-\delta)(1-\tau)\bar{\alpha}$.

Now consider equilibrium outcomes in period t. Using $K_{t-1} = K$, we now have

$$W_t = (1-\tau_t)\bar{\alpha} + K_{t-1} = \frac{1}{1-\delta}(1-(1-\delta)\tau_t - \delta\tau)\bar{\alpha} \tag{28}$$

which together with $G_t = \lambda\tau_t W_t + (1-\lambda)\tau W$ gives (25).

When $\tau_s = \tau$ for all $s \leqslant t-1$, $\sum_{s \leqslant t-1} \delta^{t-s}(1-\bar{\tau}_{s+1}^{t-1}) = \delta/(1-\delta(1-\tau))$ and therefore

$$w_{it} = (1-\tau_t)\alpha_i + \frac{\delta}{1-\delta(1-\tau)}\{(1-\tau)^2\alpha_i + (G + (\beta_i - 1)\phi G)\}, \tag{29}$$

whereas $\hat{w}_{it} = (1-\tau_t)\alpha_i + \frac{\delta}{1-\delta}(1-\tau)\alpha_i$. It follows that

$$\begin{aligned} y_{it} - \hat{y}_{it} &= (1-\tau_t)w_{it} + G_t + (r_{it} - R_t) - \hat{w}_{it} \\ &= \left\{-\tau_t(1-\tau_t) + \frac{\delta}{1-\delta(1-\tau)}(1-\tau_t)(1-\tau)^2 - \frac{\delta}{1-\delta}(1-\tau)\right\}\alpha_i \\ &\quad + \left\{G_t + (1-\tau_t)\frac{\delta}{1-\delta(1-\tau)}\,G\right\}(1+\phi(\beta_i - 1)). \end{aligned}$$

Next, using (13) and $w_{it} - \hat{w}_{it} = k_{it-1} - \hat{k}_{it-1}$, we get $Y - \hat{Y} = (K_{t-1} - \hat{K}_{t-1}) + (G_t - \tau_t W_t)$. By the expressions for G_t and $G, G_t - \tau_t W_t = -(\frac{1-\lambda}{\lambda})(G_t - G)$, while

$K-\hat{K}=\delta(W-\hat{W})=\delta(Y-\hat{Y})$. It follows that $Y-\hat{Y}=\frac{1-\lambda}{(1-\delta)\lambda}(G_t-G)$ and therefore

$$\begin{aligned}\Omega_t &= Var(y_{it}-\hat{y}_{it})+(Y-\hat{Y})^2\\ &= \left\{-\tau_t(1-\tau_t)+\frac{\delta}{1-\delta(1-\tau)}(1-\tau_t)(1-\tau)^2-\frac{\delta}{1-\delta}(1-\tau)\right\}^2\sigma_\alpha^2\\ &\quad+\left\{G_t+\frac{\delta}{1-\delta(1-\tau)}(1-\tau_t)G\right\}^2\phi^2\sigma_\beta^2+\left\{\frac{1-\lambda}{(1-\delta)\lambda}(G_t-G)\right\}^2.\end{aligned}$$

Substituting $G=G(\tau,\tau)$ and $G_t=G(\tau_t,\tau)$ and rearranging gives (24).

Finally, consider the private utility of agent i in period t. Since the history is stationary and individual characteristics are fully persistent, we have that $k_{is}=k_i$ (and similarly $y_{is}=y_i$, $r_{is}=w_i$, $r_{is}=w_i$) for all $s\leqslant t-1$. From (8) and (16),

$$u_{it}=\tfrac{1}{2}(1-\tau_t)^2\alpha_i+(1-\tau_t)k_i+G_t+(\tfrac{1}{2}\beta_i-1)\phi G_t. \tag{30}$$

Using the fact that $G_t-\tau_t W_t=-(1-\lambda)/\lambda(G_t-G)$ and $\tau_t W_t=\tau_t((1-\tau_t)\bar{\alpha}+K)$, and rearranging, we get

$$\begin{aligned}u_{it} &= \left\{\frac{1}{2}\alpha_i+k_i+\frac{1-\lambda}{\lambda}G\right\}-\left\{\frac{1}{2}\alpha_i\tau_t^2+\frac{1}{2}\beta_i\phi G_t+\frac{1-\lambda}{\lambda}G_t\right\}\\ &\quad+\tau_t(1-\tau_t)(\bar{\alpha}-\alpha_i)+\tau_t(K-k_i)+(\beta_i-1)\phi G_t.\end{aligned} \tag{31}$$

Next, as in (29),

$$k_i=\frac{\delta}{1-\delta(1-\tau)}[(1-\tau)^2\alpha_i+G+(\beta_i-1)\phi G],$$

and therefore

$$K-k_i=\frac{\delta}{1-\delta(1-\tau)}[(1-\tau)^2(\bar{\alpha}-\alpha_i)+(1-\beta_i)\phi G]. \tag{32}$$

That is, agent i has inherited more wealth than the mean if his α_i and/or β_i is sufficiently high. Combining the above with (31), and ignoring the term $\frac{1}{2}\alpha_i+k_i+((1-\lambda)/\lambda)G$ which does not depend on τ_t, we get

$$\begin{aligned}u_{it} &= -\left\{\frac{1}{2}\alpha_i\tau_t^2+\frac{1}{2}\beta_i\phi G_t+\frac{1-\lambda}{\lambda}G_t\right\}+\tau_t(1-\tau_t)(\bar{\alpha}-\alpha_i)\\ &\quad+\tau_t\frac{\delta}{1-\delta(1-\tau)}\{(1-\tau)^2(\bar{\alpha}-\alpha_i)+(1-\beta_i)\phi G\}+(\beta_i-1)\phi G_t.\end{aligned}$$

Substituting $G=G(\tau,\tau)$ and $G_t=G(\tau_t,\tau)$ into the above gives (23) and concludes the proof. □

Proof of Propositions 2 and 3. It follows from the analysis in the main text. □

References

Alesina, A., Angeletos, G.M., 2005. Fairness and redistribution. American Economic Review 95, 960–980.

Alesina, A., Glaeser, E., 2004. Fighting Poverty in the US and Europe: A World of Difference. Oxford University Press, Oxford, UK.

Alesina, A., La Ferrara, E., 2005. Preferences for redistribution in the land of opportunity. Journal of Public Economics, forthcoming.
Alesina, A., Baqir, R., Easterly, W., 2000. Redistributive public employment. Journal of Urban Economics 48, 219–241.
Alesina, A., Denninger, S., Rostagno, M., 2001a. Redistribution through public employment: the case of Italy. IMF Staff Papers 48, 447–473.
Alesina, A., Glaeser, E., Sacerdote, B., 2001b. Why doesn't the United States have a European-style welfare state? Brookings Papers on Economic Activity, vol. 2.
Andvig, J., Moene, K., 1991. How corruption may corrupt. Journal of Economic Behavior and Organization 13, 63–76.
Angeletos, G.M., Kollintzas, T., 1999. Corruption, rent seeking and growth. CEPR Working Paper 2464.
Banerjee, A., 1997. A theory of misgovernance. Quarterly Journal of Economics 112, 1289–1331.
Baumol, W.J., 1990. Entrepreneurship: productive, unproductive, and destructive. Journal of Political Economy 98, 893–921.
Benabou, R., Tirole, J., 2005. Belief in a just world and dedistributive politics. NBER Working Paper 11208.
Di Tella, R., Mc Culloch, R., 2003. Why doesn't capitalism flow to poor countries? Unpublished.
Djaonkv, S., Glaeser, E., La Porta, R., Lopez de Silanes, F., Shleifer, A., 2002. The regulation of entry. Quarterly Journal of Economics 117, 1–38.
Dornbusch, R., Edwards, S. (Eds.), 1991. The Macroeconomics of Populism in Latin America. University of Chicago Press, NBER, Chicago, Cambridge, MA.
Fehr, E., Schmidt, K., 2001. Theories of fairness and reciprocity—evidence and economic applications. Prepared for the 8th World Congress of the Econometric Society.
Glaeser, E., Shleifer, A., 2003. The rise of the regulatory state. Journal of Economic Literature 41, 401–425.
Johnson, S., Kaufman, D., Shleifer A., 1997. The unofficial economy in transition. Brookings Papers on Economic Activity, pp. 159–239.
Josephson, M., 1934. The Robber Barons. Harcourt Brace and Co., New York.
Knack, S., Keefer, P., 1995. Institutions and economic performance: cross-country tests using alternative institutional measures. Economic and Politics 7, 207–227.
Mauro, P., 1995. Corruption and growth. Quarterly Journal of Economics 110, 681–712.
Meltzer, A., Richard, S., 1981. A rational theory of the size of government. Journal of Political Economy 89, 914–927.
Mueller, D., 2003. Public Choice. Cambridge University Press, Cambridge, UK.
Murphy, K.M., Shleifer, A., Vishny, R.W., 1993. Why is rent-seeking so costly to growth? American Economic Review 83, 409–414.
Olken, B., 2003. Corruption and the costs of redistribution. Unpublished.
Perotti, R., 1996. Growth, income distribution and democracy: what the data say. Journal of Economic Growth 1, 149–187.
Piketty, T., 1995. Social mobility and redistributive politics. Quarterly Journal of Economics 110, 551–584.
Rajan, R., Zingales, L., 2002. Saving Capitalism from Capitalists. Crown Publishing, New York.
Romer, T., 1975. Individual welfare, majority voting and the properties of a linear income tax. Journal of Public Economics 7, 163–188.
Stigler, G., 1971. The theory of economic regulation. Bell Journal of Economics 2, 137–146.