Social Mobility and Political Transitions

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Abstract

I address the role of social mobility in political transitions. I develop a political economy model of regime transitions that incorporates social mobility as a key feature of the economy capturing the political attitudes toward redistribution. I show that social mobility facilitates democratization by reducing the conflict over redistribution between the rich and the poor. Furthermore, it facilitates democratic consolidation by reducing the likelihood of a coup under democracy. On the other hand, social mobility helps to keep an authoritarian regime stable by reducing the likelihood of mass movements against political elites.

1 Introduction

The role of social mobility in the fate of political regimes has been overlooked by social scientists, despite social mobility being raised as a central issue in public debates in many countries. For example, The Houston Chronicle (September 1, 2002) notes that "few middle-class Mexicans expect to do better than their parents. More often they are focused on not slipping below the blurry line between working class and poor. Even if they do everything right - get an education and a professional job and spend their earnings only on life's necessities - people know there's no guarantee they will get ahead." Mike Williams (November 17, 2002) argues that "the impoverished masses see little hope of success in systems dominated

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by tiny, rich elites" in Latin American countries. A letter to the Editor of the Financial Times (February 25, 2002) suggests that liberal reforms cannot be "keys to nirvana" to the poor economic situation and slow democratic progress in Argentina unless these reforms give top priority to opportunities for social mobility.[1] This problem stands out clearly in the political economy literature as well. While scholars recognize the effects of social mobility on redistributive politics as well as the importance of redistributive politics in political transitions, they have not addressed the role of social mobility on the discourse of political regimes. The major goal of this paper is to bring social mobility more explicitly into research on political transitions.

Social mobility has long been thought to explain different attitudes toward redistributive politics (De Tocqueville 1835, Marx 1852, Hirschman 1973, Piketty 1995, Ravallion and Lokshin 2000, Alesina and La Ferrara 2001, Benabou and Ők 2001). Benabou and Ők (2001) formalize the mobility process as a key feature of the economy. They consider that people vote on the basis of their assessment of their prospects for social mobility (upward or downward) relative to the rest of the society. They show that there may be a range of incomes below average where people that expect to be rich in the future do not support high rates of redistribution. Ravallion and Lokshin (2000) argue that, in 1990s Russia, support for further redistribution is strongest among the currently well-off Russians who fear losing their jobs and wealth, and weaker among the Russians with expectations of future welfare. Using individual level data from the US, Alesina and La Ferrara (2001) also find that social mobility negatively affects individual support for redistributive politics.

On the other hand, recent studies of political transitions have demonstrated a strong link between political transitions and redistributive politics (Acemoğlu and Robinson 2000, 2001 and Rosendorff 2001). Both Acemoğlu and Robinson (2001) and Rosendorff (2001) argue that transition to democracy is more likely in societies whose income distribution is more egalitarian. However, despite the recognition of the effect of social mobility on attitudes towards redistributive politics, the implications of social mobility for political transitions still remain an open question in the political economy literature.

I address this question by combining these two different strands of the literature on social mobility and political transitions. My main argument is that social mobility accounts for the behavior of social classes and affect political transitions. To present my arguments in a theoretical framework, I build a political economy model of regime transitions upon Acemoğlu and Robinson (2001) by incorporating social mobility as a key feature of the economy à la Benabou and Ők (2001).

I consider a discrete time, infinite horizon model. The economy consists of a continuum of infinitely lived agents. Each period, each agent belongs to a social class: Upper class (the rich) or lower class (the poor). The rich is a privileged, high income minority that has disproportionate access to the resources and power where as the poor is an underprivileged, low income majority of the population. The demographics of the society are subject to change through social mobility: A poor (rich) agent may become rich (poor) next period with some probability.

The government provides redistribution through taxation and transfers. The rich controls the government under autocracy and the poor (the majority) under democracy. I assume that economically good times are often the case. Yet, the political regime may also face severe recessions that lead to social unrest (revolution from below or coup from above) and in turn lead to political transitions. This assumption is in line with the literature arguing that political transitions almost always occur during economically bad times (Londregan and Poole 1990, 1996, Haggard and Kaufman 1995, Geddes 1999, Zak and Feng 2003).

I emphasize that, under autocracy, the rich prefer no redistribution during economically good times since there is no revolutionary threat. In other words, as Geddes (2000) argues, an authoritarian regime stays stable as long as its political elite manage the economy well. Only during bad times, will the rich increase taxes to avoid a revolution. And, only upon anticipating that a revolution cannot be prevented by a temporary tax increase, will the rich enfranchise the poor. This is in line with Yashar's (1997) argument that democratic transitions do not occur as long as there is no social unrest that would push the rich (the elite) to move the regime towards democracy.

Under democracy, the poor prefers redistribution during economically good times since there is no coup threat. Only during bad times, will the poor lower taxes to avoid a coup. Even then, the rich may attempt a coup in order to avoid higher redistribution rates in future (Gasiorowski 1995, Przeworski and Limongi 1997). Coups in Argentina in 1930, Brazil in 1964, and Chile in 1973 occurred to prevent further redistribution (Smith 1978, Stepan 1978).

However, despite suffering from severe economic crises after their democratic transitions in the 1980s, Argentina and Brazil have not experienced high rates of redistribution that might have led to democratic breakdowns. Social mobility offers an explanation for the survival of these political regimes. One major implication of my model is that an increase in social mobility increases the likelihood of democratization[2] by decreasing the conflict over redistribution between the rich and the poor, and facilitates the stability of a democratic regime by decreasing the likelihood of a coup. Lamounier (1995) notes that after democratic transition, a significant degree of social mobility existed in Brazil despite severe economic inequality. Similarly, Catterberg and Zayuelas (1992) argue that, despite poor economic conditions of the 1980s, the people of Argentina strongly believed that they would have better living standards in future. Furthermore, the social unrest in 2002 against the political elite of Argentina is attributed in public debates to the loss of belief in social mobility accompanied by very poor economic conditions (e.g. see Williams 2002). Social mobility also offers an explanation for India, a country with considerable poor population that could consolidate democracy. Das Gupta (1995) stresses that in India, a promise of expansion of privileges offered a "mobility incentive to a wider number in rural and urban areas who developed a sense of stake in the system more on the basis of aspirations than accomplishment (308)." Indian political leaders also used "job reservation" not only as an expression of caste politics but more importantly as an instrument of social mobility on the part of backward castes to build and keep support for the democratic regime.

One other major implication of the model is that an increase in social mobility may facilitate the stability of an autocracy by decreasing the likelihood of a revolution. In late 19th century France, for example, the political leaders promoted social mobility to create a middle class with less inclination towards both revolution and redistributive conflicts (Bourguignon and Verdier 2000). In South Korea, the military rule expanded the number of students enrolled in higher education from 100,000 to 600,000 not only to supply an educated workforce for Korea's economy, but also to "satisfy a pervasive hunger for education, and provide expectations of social mobility for the lower class" and delay democratization accordingly (Steinberg 1995). In Thailand, provision of an "important ladder for social mobility" through military and bureaucracy to middle and lower class children accounts for the little class conflict and stable semi-democracy (Samudavanija 1995). Such strategies were also adopted by colonial powers to maintain their regime by giving hope to the colonized that they had a stake in the colonial regime and would have better lives under that regime (Bourguignon and Verdier 2000). Also, in Mexico, the deep economic crises of 1980s and 1990s have largely eliminated the expectations of future welfare for the lower class people (Levy and Bruhn 1995). In particular, during the 1980s, inter-generational mobility was damaged due to slowed educational progress in the country (Binder and Woodruff 2002). Among other things, this stalled social mobility accounts for the enormous loss of confidence in the PRI's civilian authoritarian regime that the PRI elites agreed to transfer power to a non-PRI president after 70 years of continuous political rule in Mexico.

The paper proceeds as follows: Section 2 presents the model. Section 3 defines the equilibrium and Section 4 performs the equilibrium analysis and presents the results. Section 5 assesses the impact of social mobility on political transitions. Section 6 concludes. All technical proofs are contained in the Appendix.

2 Model

My model builds on Acemoğlu and Robinson (2001) by incorporating social mobility as a key feature of the economy à la Benabou and Ők (2001). Therefore, almost all of my assumptions follow from these two papers.

The time horizon is discrete and infinite. The economy consists of a continuum of infinitely lived agents. There are two types of agents each period: The *poor* and the *rich*. The poor constitutes the majority of the population. Let $\lambda \in (0.5, 1)$ be the ratio of the poor. Agents discount future by the same discount rate β.

Income of the country, w, is drawn from the following distribution each period: $w = w^L$ with probability π, and $w = w^H$ with probability $1 - \pi$, where $w^H > w^L$, and $\pi < 0.5$, i.e. economic downturns are less likely. I will refer $e = H$ as a *good time* and $e = L$ as a *bad time* in the text.

The poor's share of income is θ. That is, when income is w^e, $e \in \{H, L\}$, per capita income of the poor is $x_p^e = \frac{\theta w^e}{\lambda}$ and per capita income of the rich is $x_r^e = \frac{(1-\theta)w^e}{1-\lambda}$.

I introduce social mobility into the model as a key feature of the economy adopting Behrman's (2000) definition of relative (exchange) social mobility: "Holding total income and income distribution constant, after all, relative social mobility is greater if wealthier people more frequently change places with poorer people than if such exchanges occur less frequently. But the number of poorer people is the same whether there are more or fewer of such changes; they just are different people in different periods (p.74)." Hence, relative social mobility, rather than showing total income change in a society, shows relative social status within a society. Pastore (1982, p.5) argues that "[i]n the analysis of the social dynamics, studies of upward and downward movements are equally important. The two types of mobility coexist in dynamic societies and bear equal relevance to understanding social development." Following Behrman (2000) and Pastore (1982), I model social mobility as a Markov process as follows: An agent who is poor today moves upward and becomes rich tomorrow with probability q_p. An agent who is rich today moves downward and becomes poor tomorrow with probability q_r.

Each Markov process yields a stationary distribution in the long-run. In this stationary distribution, transition probabilities and population demographics satisfy the following: $\lambda q_p = (1-\lambda)q_r$, that is, the number of poor agents that will move upward is equal to the number of rich agents that will move downward.[3]

I perform my analysis in the steady state of this Markov process. In this state, aggregate income, the relative sizes of social classes, so the income distribution and income inequality remain constant. This allows me to perform comparative statics exercises purely on (relative) social mobility by keeping income inequality and income distribution constant throughout time.[4]

Redistribution occurs through taxation. When the tax rate is τ, and the transfers made by the government is T, the disposable income of an individual with income x is given by $(1-\tau)x + T$. I assume that preferences over disposable income are risk neutral, that is $(1-\tau)x + T$ is also the utility level of that individual. I borrow this assumption from Acemoğlu and Robinson (2001) and Benabou and Ők (2001). It allows me to abstract from the issue of risk distribution.

Taxing is costly due to deadweight loss. When the economy is in state $e \in \{H, L\}$ and the tax rate is $\tau \in [0,1]$, the total cost of taxing income is $C(\tau)w^e$. Balanced budget requires that $T = (\tau - C(\tau))w^e$. Again, in order to abstract from risk distribution I assume that $C(\tau) = c\tau$ where $c \in (0,1)$ is constant.[5] Following Benabou and Ők (2001), I assume that fiscal policy takes time to implement:[6] Tomorrow's tax rate is set today.[7]

The political state or the regime can be *autocracy* (A), *democracy* (D) or *revolution* (Rev). Only one political transition may occur within a period. The initial political state is autocracy. My analysis is valid when the initial political state is democracy as well.

At the beginning of each period, first of all, social mobility occurs. Next, income is realized and redistribution occurs according to the tax rate that has been set in the previous period. Then, the timing of the events and political transition within this period is given as follows.

Under autocracy, the rich holds the power, and decides whether to enfranchise the poor or not. If the rich extends franchise, then the regime switches to democracy and the poor sets the tax rate for the next period. Otherwise, the rich chooses a tax rate for the next period, and the poor decides whether to revolt or not. If the poor revolts, the rich of that period loses everything forever, and the regime switches to revolution. Following Acemoğlu and Robinson (2001), the revolution is an absorbing political state. There is no class difference and income is shared equally thereafter. Extending franchise always prevents a revolution. Increasing tax may prevent it as well. If the rich does not extend franchise and the poor does not revolt, then the tax rate that the rich sets prevails, and the regime remains authoritarian (Figure 1). Revolution is costly. Let ψ_{rev} (ψ'_{rev}) be the one-time per capita cost of a revolution during bad (good) times.

Under democracy, the poor (the majority) holds the power and sets a tax rate for the next period. Then, the rich decides whether to attempt a coup or not. If the rich attempts a coup, the regime switches to autocracy and the rich determines the tax rate for the next period. Otherwise, the tax rate that the poor sets prevails, and the regime remains democratic (Figure 2). Coup is costly. Let ϕ_{coup} (ϕ'_{coup}) be the per capita cost of a coup during bad (good) times.[8]

[Figure 1 and Figure 2 here]

3 Equilibrium

Following Acemoğlu and Robinson (2001), in order to avoid the free-rider problem during a revolution (coup), I assume that if a revolution (coup) is attempted, and a fraction $\kappa < 1$ of the poor (rich) takes part in it, then the revolution (coup) always succeeds. In turn, I can treat the rich as one player and the poor as another player. Then, I can represent this economy as a repeated game between two agents.

I characterize the pure strategy Markov perfect equilibrium of this game. A Markov perfect equilibrium consists of Markov perfect strategies that depend only on the current state of the world and the prior actions taken within the same period. This equilibrium notion embeds an important assumption: Neither player can commit to future actions.[9] Furthermore, it generates a stationary equilibrium path.

In any period, the state of the world is given by the regime, the tax rate, and the income level. Formally, the state of the world is denoted by $S = (R, \tau, e)$. R denotes the regime and it can be one of A(autocracy), D(democracy) and Rev(revolution). τ is the tax rate that will be applied this period. e is either H or L and its value is realized at the beginning of the current period. R and τ are determined by the end of the previous period.

The strategy of the rich can be expressed as a function of the state of the world, and the tax decision of the poor under a democratic regime. The rich's strategy consists of three decisions: (i) whether to extend franchise under autocracy, (ii) to set the tax rate under autocracy in case the rich decides not to extend franchise, and (iii) whether to attempt a coup under democracy. Similarly, the strategy of the poor can be expressed as a function of the state of the world and the rich's decision on extending franchise and the tax rate the rich sets in case the rich wants to keep the autocracy. The poor's strategy consists of two decisions: (i) whether to attempt a revolution under autocracy, and (ii) to set the tax rate under democracy.

A Markov perfect pure strategy profile constitutes a pure strategy Markov perfect equilibrium if each player's strategy is a best response to that of the other in all possible states. I refer the reader to the Appendix for a more formal definition.

4 Equilibrium Analysis

In this section, I characterize the pure strategy Markov perfect equilibrium of the infinitely repeated game played between the poor and the rich. First, I make two assumptions that restrict my model in an empirically plausible way.

I borrow this assumption from Acemoğlu and Robinson (2001). In good times, the cost of revolution (ψ'_{rev}) and the cost of coup (ϕ'_{coup}) are so high that the poor prefers not to revolt under autocracy in good times, and the rich prefers not to attempt a coup under democracy in good times.

The democratization literature essentially agrees that political transitions through a revolution or a coup occur generally during economically bad times, and in turn supports this assumption (Londregan and Poole 1990, Haggard and Kaufman 1995, Gasiorowski 1995, Przeworski et al. 1996, Przeworski and Limongi 1997, Geddes 1999).

Thus, the rich (poor) can choose any tax rate in good times under autocracy (democracy) without triggering a revolution (coup). Under this assumption, a revolution or a coup is likely only during bad times.

My next assumption guarantees that either there is no conflict between poor and rich over redistribution (they prefer the same tax rate), or the poor prefers higher redistribution rates (higher taxes) where as the rich prefers lower redistribution rates (lower taxes), everything else being equal. This is in line with Ravallion and Lokshin's (2001, p.87) finding that support for redistribution tends to be greater among the poor than the rich. I need to introduce some more notations before stating the assumption.

Let $i, j \in \{p, r\}$ and $i \neq j$. Let $\bar{x}_i$ denote the expected income of agent i before the realization of w in a period, i.e. $\bar{x}_i = \pi x_i^L + (1-\pi)x_i^H$. Let $\bar{w} = \pi w^L + (1-\pi)w^H$ be the expected national income. Let $\bar{w}_i$ denote the expected income of agent i before the realization of social mobility at the beginning of the period, i.e. $\bar{w}_i = q_i\bar{x}_j + (1-q_i)\bar{x}_i$. Then $\bar{Y}_i^d(\tau) = (1-\tau)\bar{w}_i + (\tau - c\tau)\bar{w}$ is agent i's one-period expected disposable income when the tax rate for that period is τ. The tax rate that maximizes agent i's one-period expected disposable income is the solution of the following problem: $\tau_i = \arg\max_{\tau} \bar{Y}_i^d(\tau)$. The solution of this maximization problem yields $\tau_i = 1$ if $c < c_i = 1 - \frac{\bar{w}_i}{\bar{w}}$, and $\tau_i = 0$ if $c \geq c_i$. That is, agent i prefers full redistribution ($\tau_i = 1$) when the cost of taxation satisfies $c < c_i$ and prefers no distribution ($\tau_i = 0$) when the cost of taxation satisfies $c \geq c_i$.

Then $c_r < c_p$ would guarantee that the range of c for which the rich prefers a higher rate of redistribution, $[0, c_r]$, is a subset of that of the poor, $[0, c_p]$. That is, under this assumption, the poor's preferred rate of redistribution is higher than or equal to that of the rich for any given cost of taxation, c. The following technical lemma characterizes this situation. I give all the proofs in the Appendix.

Lemma 1: $c_r < c_p$ if only if $q_p < 1 - \lambda$

Therefore, I assume that $q_p < 1 - \lambda$. Furthermore, under this assumption, $c_r < 0 < c_p$. That is, $\tau_r = 0$ for all values of c. If $c_p \leq c$, then $\tau_p = \tau_r = 0$. In this case, there will be no threat of a revolution or a coup anytime, since there is no conflict over redistribution. Then, all the agents will be indifferent between autocracy and democracy. Introducing even a very small cost for keeping an autocracy implies that the rich's optimal decision in this case is to extend franchise under autocracy. For the sake of simplicity, without introducing such additional cost, I will assume that the rich extends franchise when $c_p \leq c$ and analyze the model when $c < c_p$. This is the region in which a conflict over redistribution occurs: The poor prefers the highest redistribution rate $(\tau_p = 1)$, where as the rich prefers no distribution at all ($\tau_r = 0$).

Characterization of the Equilibrium

A Markov perfect equilibrium generates a stationary transition pattern. Consider the very beginning of a period that starts under the regime R, and the tax rate τ. Let $V_i(R, \tau)$ be agent i's expected utility on the transition path from that point on. The regime R may switch to another regime R' in that period. Let the cost of transition be $\chi(R, R') = \frac{\phi_{coup}}{\beta}$ if the transition from R to R' is due to a coup; $\chi(R, R') = \frac{\psi_{rev}}{\beta}$ if the transition from R to R' is due to a revolution; and $\chi(R, R') = 0$ otherwise. Remember that social unrest is possible only in bad times. Then

$$V_i(R, \tau) = \bar{Y}_i^d(\tau) + \beta[q_i W_j(R) + (1 - q_i) W_i(R)]$$

where

$$W_i(R) = \pi[V_i(R', \tau') - \chi(R, R')] + (1-\pi)V_i(R'', \tau'')$$

where (R', τ') is the next regime and the tax rate if it is a bad time, and (R'', τ'') is the next regime and the tax rate if it is a good time. Redistribution will occur according to τ in the beginning of the current period.

The expression for $V_i(R, \tau)$ captures that agent i may become j with probability q_i. Taking social mobility into account, agent i's expected current disposable income is $\bar{Y}_i^d(\tau)$. Agent i becomes a type j with probability q_i. Then, the agent's personal discounted continuation utility will be $\beta W_j(R)$. Agent i will remain type i with probability $1-q_i$. Then the personal discounted continuation utility will be $\beta W_i(R)$.

The expression for $W_i(R)$ captures that it will be a bad time with probability π. In this case, the regime and the tax rate will switch to (R', τ') on the transition path. Then agent i's expected payoff at the very beginning of next period is $V_i(R', \tau') - \chi(R, R')$. It will be a good time with probability $1-\pi$. In this case, the regime and the tax rate will switch to (R'', τ'') on the transition path. Then agent i's expected payoff at the very beginning of next period is $V_i(R'', \tau'')$. Since a transition in a good time is not due to social unrest, $\chi(R, R'') = 0$.

Let y_i^d denote the current disposable income of agent i after realization of a low w, i.e. $y_i^d = (1-\tau)x_i^L + \tau(1-c)w^L$ where τ is determined in the previous period. Note that, y_i^d is not affected by any current decision of agents, since τ is set in the previous period.

The characterization of the equilibrium is not a trivial extension of Acemoğlu and Robinson (2001). There is no social mobility in their work, so each social class prefers holding the power. How social mobility affects the preferences of agents over different regimes is not obvious. For example, a high social mobility rate might induce the rich to prefer extending the franchise, thinking that he could become poor with a high probability next period. Or, the poor might prefer not to prevent a coup under democracy, thinking that he could become rich next period and enjoy autocracy. I show in the Appendix that there does not exist any equilibrium in which a social class in power does not avoid regime transition although he can avoid it via redistribution (Propositions 8 and 9). Then, in any equilibrium, the social class that holds the power will try to keep the power as long as he can.

Now, I will propose several critical values that will be crucial in characterizing the equilibrium.

The first two critical values concern the cost of coup, ϕ_{coup}. Consider the following stationary transition pattern: Under autocracy, the rich keeps the regime authoritarian and sets the tax rate at 0 during good times. The rich extends franchise in a bad time, then the poor sets the tax rate at 1. Under democracy, the poor sets the tax rate at 1 during good times and at τ during bad times. Democracy prevails forever.

Assuming that this transition pattern will prevail from next period on, the payoff of alternative actions to the rich in this period during a bad time under democracy can be calculated as follows:

- The rich's payoff of attempting a coup then setting the tax rate at zero is given by $y_r^d - \phi_{coup} + \beta V_r(A, 0)$ where $V_i(R', \tau')$ denotes the expected continuation utility of type i agent under the regime R' and tax rate τ' along this transition path. Note that if the rich attempts a coup during a bad time, the regime switches to autocracy. Furthermore, the rich bears the cost of coup, ϕ_{coup}. The level of current disposable income, y_r^d, is independent of the rich's decision.

- Similarly, the rich's payoff from not attempting a coup is given by $y_r^d + \beta V_r(D, \tau)$.

Let $\phi_{coup} = \phi(\tau)$ be such that the rich is indifferent between a coup and no coup, i.e. $\phi(\tau) = \beta \left[V_r(A, 0) - V_r(D, \tau)\right]$. Define the following: $\phi_l = \phi(0)$ and $\phi_h = \phi(1)$. Then, when $\phi_{coup} < \phi_l$, for any tax rate, the rich prefers a coup rather than no coup along the transition path above. On the other hand, when $\phi_{coup} > \phi_h$, for any tax rate, the rich prefers no coup rather than a coup. These values vary with the level of social mobility, q_p. The next proposition compares these critical values for all values of q_p (see Figure 3):

[Figure 3 here]

Proposition 1: $\phi_h > \phi_l$ for all values of q_p.

The next two critical values concern the cost of revolution, ψ_{rev}. Consider the following stationary transition pattern: The regime remains authoritarian and the rich always sets the tax rate at zero during good times and at τ during bad times.

Assuming that this transition pattern will prevail from next period on, the payoff of alternative actions to the poor in this period during a bad time under autocracy can be calculated as follows:

- The poor's payoff from revolting and setting the tax rate at zero thereafter is given by $y_p^d - \psi_{rev} + \beta V_p(Rev, 0)$ where $V_p(Rev, 0) = \frac{w}{\lambda(1-\beta)}$. Note that the poor bears the cost of revolution, ψ_{rev}. The level of current disposable income, y_p^d, is independent of the poor's decision.

- Similarly, the payoff from not revolting is given by $y_p^d + \beta V_p(A, \tau)$.

Let $\psi_{rev} = \psi(\tau)$ be such that the poor is indifferent between revolting and not revolting, i.e. $\psi(\tau) = \beta \left[V_p(Rev, 0) - V_p(A, \tau)\right]$. Define the following: $\psi_0 = \psi(0)$ and $\psi_1 = \psi(1)$. As opposed to ϕ_l and ϕ_h, we have the following:

Proposition 2: $\psi_0 - \psi_1$ is a decreasing function of q_p. Furthermore, $\psi_0 > \psi_1$ for small values of q_p and $\psi_0 < \psi_1$ for large values of q_p.

Define the following: $\psi_h = \psi_0$, and $\psi_l = \min\{\psi_0, \psi_1\}$. Similarly, when $\psi_{rev} < \psi_l$, for any tax rate, the poor prefers to revolt rather than not to revolt along the transition path above. On the other hand, when $\psi_{rev} > \psi_h$, for any tax rate, the poor prefers not to revolt rather than revolt. (see Figure 3).

Next, suppose that $\psi_h > \psi_{rev} \geq \psi_l$. Consider the following transition pattern: The regime remains authoritarian, the rich sets the tax rate at 0 during good times and at $\hat{\tau}_r$ during bad times. Let $\hat{\tau}_r$ be such that $\beta V_p(A, \hat{\tau}_r) = -\psi_{rev} + \beta V_p(Rev, 0)$. That is, $\hat{\tau}_r$ is the tax rate that just prevents a revolution along this transition pattern. The proof of the existence of $\hat{\tau}_r \in [0,1]$ is given in the Appendix (Proposition 10).

Finally, suppose that $\phi_h > \phi_{coup} \geq \phi_l$. Consider the following transition pattern: Under autocracy, the rich sets the tax rate at 0 during a good time and extends franchise during a bad time. Once the regime switches to democracy, it remains democratic, the poor sets the tax rate at 1 during good times and at $\hat{\tau}_d$ during bad times. Let $\hat{\tau}_d$ be such that $\beta V_r(D, \hat{\tau}_d) = -\phi_{coup} + \beta V_r(A, 0)$. That is, $\hat{\tau}_d$ is the tax rate that just prevents a coup along this transition pattern. The proof of the existence of $\hat{\tau}_d \in [0,1]$ is given in the Appendix (Proposition 11).

Remember that c_p is the critical value of cost of taxation above which the poor does not prefer redistribution. Then the following theorem characterizes the Markov perfect equilibrium.

Theorem:

1. When $c \geq c_p$, the regime switches to democracy. The tax rate is always set at zero. The rich does not attempt a coup.

   When $c < c_p$:

2. If $\psi_{rev} \geq \psi_h$, the regime stays authoritarian. The rich always sets the tax rate at zero. The poor does not attempt a revolution.

3. If $\psi_h > \psi_{rev} \geq \psi_l$, the regime stays authoritarian. The rich sets the tax rate at zero during good times and at $\hat{\tau}_r$ during bad times.

4. If $\psi_{rev} < \psi_l$ and $\phi_{coup} \geq \phi_h$, the rich sets the tax rate at zero during good times under autocracy. He extends franchise during the first bad time. The poor always sets the tax rate at 1. The rich does not attempt a coup.

5. If $\psi_{rev} < \psi_l$ and $\phi_h > \phi_{coup} \geq \phi_l$, the rich sets the tax rate at zero during good times under autocracy. He extends franchise during the first bad time, then the poor sets

the tax rate at 1. Under democracy, the poor sets the tax rate at 1 during good times. He sets the tax rate at $\hat{\tau}_d$ during bad times. The rich does not attempt a coup.

6. If $\psi_{rev} < \psi_l$ and $\phi_l > \phi_{coup}$, the rich sets the tax rate at zero during good times under autocracy. He extends franchise during the first bad time, then the poor sets the tax rate at 1. Under democracy, the poor sets the tax rate at 1 during good times. The rich attempts a coup during bad times and sets the tax rate at zero.

First, social mobility induces a range, $c \geq c_p$, where there is no conflict over redistribution across social classes. In this case, the regime switches to democracy regardless of the values of the other parameters in the model.

When $c < c_p$, the conflict over redistribution appears between the poor and the rich. Under autocracy, the rich prefers no redistribution during economically good times since there is no revolutionary threat. In other words, as Geddes (2000) argues, an authoritarian regime stays stable as long as the political elite manages the economy well. During bad times, will the rich increase taxes to avoid a revolution. And, only when he anticipates that he will not be able to prevent a revolution by a temporary tax increase, will the rich extend franchise to the poor. This is in line with Yashar's (1997) argument that democratic transitions do not occur as long as there is no social or political unrest that would push the rich (the elite) to move the regime towards democracy. Under democracy, the poor prefers full redistribution during economically good times since there is no coup threat. Only during bad times, will the poor lower taxes to avoid a coup. However, sometimes even a zero tax rate may not prevent a coup (Gasiorowski 1991, Przeworski and Limongi 1997). For example, military coups in Argentina in 1930, Brazil in 1964, and Chile in 1973 occurred to prevent further redistribution (Smith 1978, Stepan 1978).

Furthermore, if social mobility is sufficiently high, then $\psi_h = \psi_l$ (Proposition 2), so that there does not exist an autocracy under which the rich prevents revolution via redistribution during bad times. In other words, this striking result states that when social mobility is high, an authoritarian regime can be stabilized without any redistribution, and a revolt is avoided by the poor's future prospects of becoming a rich. However, if the cost of revolution is sufficiently low, the only way of avoiding a revolt is democratization. This result is in contrast to Acemoğlu and Robinson (2001) who obtain a range of ψ where the rich can avoid a revolt by increasing redistribution. Their model with linear deadweight loss of taxation is a special case of my model with no social mobility, i.e. $q_p = 0$. Thus, social mobility arises as an important factor in determining equilibrium transition patterns. See Figure 3 for a summary of these results.

Figure 3 says more than a summary of the Theorem: It shows how these critical values, hence the nature of political transition, are affected by social mobility as mobility increases. In the next section, I discuss the effects of social mobility on political transitions, which is the main contribution of my paper to the political economy literature.

5 Impact of Social Mobility on Political Transitions

Since I model social mobility as a stationary Markov process, the reader should interpret my comparative statics results for cross country variations or for unanticipated changes within a single country. In other words, the following propositions compare critical values that determine political transitions in different countries with different levels of social mobility or in a single country before and after an unanticipated change in the level of social mobility.

Proposition 3: $\frac{d\phi_l}{dq_p} < 0$.

As social mobility increases, the range of the cost of coup $[0, \phi_l]$, in which democracy is broken by a coup, shrinks. That is, everything else being equal in two countries (including income inequalities in these countries), coup is less likely under democracy in the country with the higher level of social mobility. Or, everything else being equal, if an unanticipated increase in social mobility occurs in a country, the likelihood of a coup under democracy decreases accordingly.

Proposition 4: $\frac{d\phi_h}{dq_p} < 0$.

When $\phi_{coup} > \phi_h$, i.e. if the cost of coup is sufficiently high, the rich never attempts a coup under democracy. I refer to this case as a consolidated democracy. As social mobility increases, the range of the cost of coup $[\phi_h, \infty)$, in which democracy is consolidated, expands. That is, everything else being equal in two countries (including income inequalities in these countries), democratic consolidation is more likely in the country with the higher level of social mobility. Or, everything else being equal, if an unanticipated increase in social mobility occurs in a country, the likelihood of a democratic consolidation increases accordingly.

Proposition 5: $\frac{dc_p}{dq_p} < 0$.

An increase in social mobility narrows down the range of cost $[0, c_p]$, in which a conflict between the rich and poor over redistribution occurs. Note that the regime switches to a consolidated democracy out of this region. So, social mobility may trigger democratization by eliminating the conflict over redistribution.

These results are consistent with the empirical facts: Huge inequalities in income distribution did not "petrify" inequalities in status in Brazil (Pastore 1982, Lamounier 1995). Lamounier (1995) notes that after democratic transition, a significant degree of social mobility existed in Brazil despite severe economic inequality. Catterberg and Zayuelas (1992) argue that, despite poor social and economic situation in 1980s, the people of Argentina strongly believed that they would have better living standards in the future. Thus, social mobility accounts for how these fledgling political regimes have survived for over a decade. Furthermore, the social unrest in 2002 against the political elite of Argentina is attributed in public debates to the loss of belief in social mobility accompanied by very poor economic conditions (e.g. see Williams 2002). Social mobility also offers an explanation for India, a country with considerable poor population that could consolidate democracy. Das Gupta (1995) stresses that in India, a promise of expansion of privileges offered a "mobility incentive to a wider number in rural and urban areas who developed a sense of stake in the system more on the basis of aspirations than accomplishment (308)." Indian political leaders also used "job reservation" not only as an expression of caste politics but more importantly as an instrument of social mobility on the part of backward castes to build and keep support for the democratic regime.

Proposition 6: $\frac{d\psi_l}{dq_p} < 0$.

When $\psi_{rev} \geq \psi_l$, i.e. if the cost of revolution is sufficiently high, the rich keeps autocracy, and the rich extends the franchise only when the cost of revolution is low, $\psi_{rev} < \psi_l$. Thus, as social mobility increases, the region in which autocracy prevails expands. In other words, the poor that is ready to revolt ($\psi_{rev} < \psi_l$) may prefer not to revolt after an unanticipated increase in social mobility ($\psi_{rev} > \psi_l'$, where ψ_l' is the new critical lower value for ψ_{rev} after the unanticipated increase in social mobility).

In late 19th century France, for example, the political leaders promoted social mobility to create a middle class with less inclination both towards revolution and redistributive conflicts (Bourguignon and Verdier 2000). The military rule in South Korea expanded the number of students enrolled in higher education from 100,000 to 600,000 not only to supply an educated workforce for Korea's economy, but also to "satisfy a pervasive hunger for education, and provide expectations of social mobility for the lower class" and delay democratization accordingly (Steinberg 1995). In Thailand, provision of an "important ladder for social mobility" through military and bureaucracy to middle and lower class children offers an explanation for the little class conflict and stable semi-democracy (Samudavanija 1995). Such strategies were also adopted by colonial powers to maintain their regime by giving hope to the colonized that they had a stake in the colonial regime and would have better lives under that regime (Bourguignon and Verdier 2000). The case of Mexico demonstrates an example in the reverse direction. In Mexico, the deep economic crises of 1980s and 1990s have largely eliminated the expectations of future welfare for the lower class people. The Mexican data demonstrate that, during 1980s, inter-generational mobility was damaged due to slowed educational progress in the country (Binder and Woodruff 2002). Among other things, this stalled social mobility has led to the loss of confidence for the PRI's civilian authoritarian regime that the PRI elites agreed to transfer power to a non-PRI president after 70 years of continuous political rule in Mexico.

6 Conclusion

Social mobility has been a central policy issue in public debates around the world and its effects on attitudes towards redistributive politics have been intensively studied in the political economy literature. On the other hand, recent studies of democratization have demonstrated a strong link between redistributive politics and political transitions. However, despite recognition of the link between social mobility and redistributive politics, the relationship between social mobility and political transitions has been overlooked by the literature. I address this question by developing a model of political transitions that incorporates social mobility as a key feature of the economy. My findings suggest the following implications for future empirical work: Social mobility facilitates democratization by reducing the conflict over redistribution between the rich and the poor. Furthermore, it facilitates democratic consolidation by reducing the likelihood of a coup. Social mobility can also keep an authoritarian regime stable by reducing the likelihood of a revolution against the political elite. These results also suggest a further research agenda with a focus on social mobility as a policy variable for ruling classes.[10]

Notes

[1]Social mobility is a key issue in public debates in developed countries as well. For example, Stephen Pollard (April 10, 1998) stresses that "all of the UK's most intractable problems are at root about blockages to the process of social mobility" and "the crux of the new UK Labour Party is the perfectly straight-forward concept of social mobility." Paul Krugman (November 22, 2002) argues that "the inherited status is making a comeback" in the U.S. today and making the gap between the upper class and the middle class increasingly harder to cross.

[2]With an increase in the likelihood of democratization, I mean that there is an expansion of the range of parameters that lead to democratization on the equilibrium path.

[3]I introduce social mobility as an exogenous Markov process. My results reveal that social mobility affects the behavior of social classes, so social mobility itself arises as an important policy variable. A future research direction on explaining differences in social mobility across countries and across time within a country is to endogenize social mobility as a choice variable in the model.

[4]See Rosendorff (2001) for the effect of changes in the relative size of competing groups on political transitions. Rosendorff (2001) argues that the relative sizes of competing groups matter for political transitions. The change in the relative size of competing groups in his model may be attributed to social mobility. However, his model does not exhibit a dynamic mobility process. Furthermore, he studies a static model in which only one transition from an autocracy to a democracy is possible. Therefore, his comparative statics on the relative size of groups does not reflect the effect of social mobility on transitions through the society's prospects towards mobility.

[5]A strictly convex cost function would induce convex preferences over tax rate even if we assume risk neutral preferences over disposable income. To see this, take two tax rates

$\tau_1, \tau_2 \in [0,1]$, $\tau_1 \neq \tau_2$. Let $\tau = \alpha\tau_1 + (1-\alpha)\tau_2$ for any $\alpha \in (0,1)$. Convexity of C implies that $(1-\tau)x + (\tau - C(\tau))w$ is greater than $\alpha[(1-\tau_1)x + (\tau_1 - C(\tau_1))w] + (1-\alpha)[(1-\tau_2)x + (\tau_2 - C(\tau_2))w]$. That is, the individual has strictly convex (risk averse) preferences over tax rates under balanced budget.

[6]See Wright (1996) for further discussions on modelling taxation under social mobility.

[7]One may tend to assume that a coup prevents current redistribution within a period, even though implementing a new tax rate different than zero in that period is impossible. This additional assumption does not change my conclusions about social mobility and political transitions. For the sake of simplifying my presentation, I abstract from this possibility.

[8] I assume that a revolution or a coup changes the political state with probability 1. Ghate, Zak and Le (2003) argue that the taxation policy may change the effectiveness of a social unrest. I abstract from such complications to better isolate the impact of social mobility on political transitions.

[9]This equilibrium notion also embodies an important philosophical consideration: These strategies suggest the simplest form of behavior that is consistent with rationality. That is, these strategies make behavior in any period depend on only the state of the world rather than on entire history of the play. Moreover, it is straightforward to calculate the rational expectations. For a similar discussion on Markov strategies, see Maskin and Tirole (2001).

[10]As in the South Korea and Thailand examples, education is one of the major policies to change level of social mobility in a society. Such policies may also have an impact on economic growth, an issue that I abstract from in this paper. For example, see Fershtman, Murphy and Weiss (1996) for the effect of education on economic growth through social status.

Figure 1: Autocracy

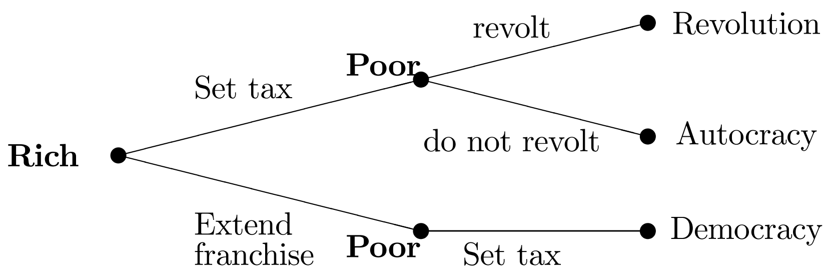


Figure 2: Democracy

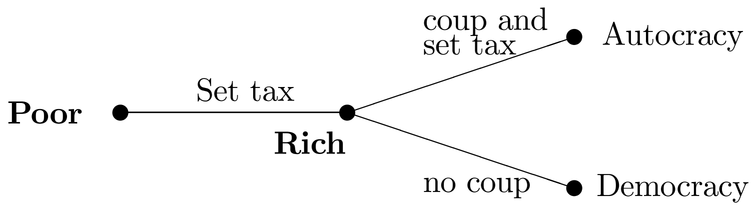
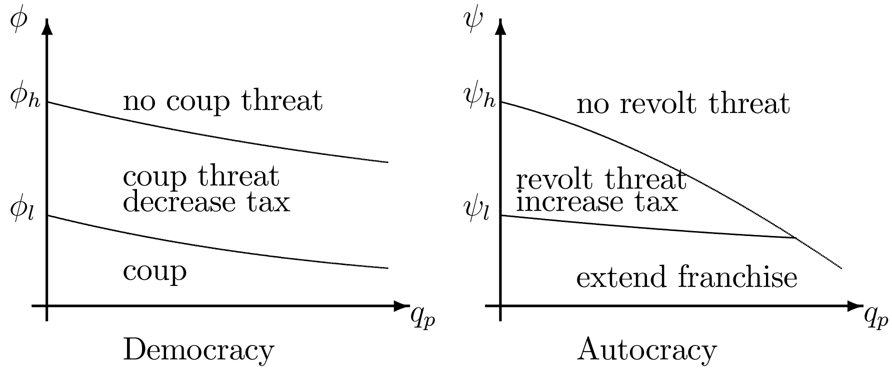


Figure 3: Equilibrium and the Impact of Social Mobility



A Equilibrium definition

Formally, let $\sigma_r(S|\hat{\tau}_p)$ denote the strategy of the rich. This is a function of the state of the world, S, and the tax decision of the poor, $\hat{\tau}_p$. The rich's strategy consists of three components: $\{franchise, coup, \hat{\tau}_r\}$. If the rich extends franchise, then $franchise = 1$, otherwise $franchise = 0$. $franchise$ applies in states $(A, ., .)$. If the rich attempts a coup, then $coup = 1$, otherwise $coup = 0$. $coup$ applies in states $(D, ., .)$. $\hat{\tau}_r$ is the tax rate set by the rich. The rich sets a tax rate when ($S = (A, ., .)$ and $franchise = 0$) or ($S = (D, ., .)$ and $coup = 1$).

Let $\sigma_p(S|franchise, \hat{\tau}_r)$ denote the strategy of the poor. This is a function of the state of the world, S, rich's decision on extending franchise, $franchise$, and the tax decision of the rich, $\hat{\tau}_r$. The poor's strategy consists of two components: $\{revolution, \hat{\tau}_p\}$. If the poor attempts a revolution, then $revolution = 1$, otherwise $revolution = 0$. $revolution$ applies in states $S = (A, ., .)$. $\hat{\tau}_p$ is the tax rate set by the poor. The poor sets a tax rate when ($S = (A, ., .)$ and $franchise = 1$), $S = (D, ., .)$ or $S = (Rev, ., .)$.

These strategies generate a transition between states as follows: The world starts with (A, τ_1, e) where τ_1 is given at the beginning of period 1. Starting from (A, τ, e) in any period, if there is a revolution, then the state transits to $(Rev, 0, e)$. A revolutionary state is an absorbing state. There is no class difference in a revolutionary state. Income is shared equally thereafter, so $\tau = 0$ is the optimal decision of the players. If there is no revolution, and the rich enfranchises the poor, then the state transits to $(D, \hat{\tau}_p, e)$. If the rich does not extend franchise, and there is no revolution, then the state transits to $(A, \hat{\tau}_r, e)$. Starting from (D, τ, e), if there is no coup, then the state transits to $(D, \hat{\tau}_p, e)$. Otherwise, it transits to $(A, \hat{\tau}_r, e)$. Let $P(S'|\sigma_p, \sigma_r, S)$ denote the probability distribution function of transition from S to S' as a function of the strategies σ_p and σ_r.

A Markov perfect pure strategy profile $(\tilde{\sigma}_p(S|franchise, \hat{\tau}_r), \tilde{\sigma}_r(S|\hat{\tau}_p))$ constitutes a pure strategy Markov perfect equilibrium if $\tilde{\sigma}_p$ and $\tilde{\sigma}_r$ are best responses to each other in all possible states. Markov perfect strategies allow for the following Bellman equations:

$$U_p(S) = \max_{\sigma_p}\{Y_r^d(\sigma_p, \tilde{\sigma}_r(S|\hat{\tau}_p), S) + \beta \int [q_p U_r(S') + (1-q_p)U_p(S')]\, dP(S'|\sigma_p, \tilde{\sigma}_r(S|\hat{\tau}_p), S)\} \quad (1)$$

and

$$U_r(S) = \max_{\sigma_r}\{Y_r^d(\tilde{\sigma}_p(S|franchise, \hat{\tau}_r), \sigma_r, S) + \beta \int [q_r U_p(S') + (1-q_r)U_r(S')]\, dP(S'|\tilde{\sigma}_p(S|franchise, \hat{\tau}_r), \sigma_r, S)\} \quad (2)$$

where Y_i^d is the disposable income of an agent of type $i \in \{p, r\}$ as a function of S, σ_p and σ_r. Thus, U_i is the net present discounted payoff of agent i as his current disposable income plus his discounted future payoff. Note that Bellman equations take social mobility into account: A poor agent will become rich with probability q_p next period; and a rich agent will become poor with probability q_r. A Markov perfect pure strategy profile $(\tilde{\sigma}_p(S|franchise, \hat{\tau}_r), \tilde{\sigma}_r(S|\hat{\tau}_p))$ constitutes a pure strategy Markov perfect equilibrium if $\tilde{\sigma}_p$ solves (1) and $\tilde{\sigma}_r$ solves (2).

B Proofs

Let $Q = 1 - q_p - q_r$. Then $Q = 1 - \frac{q_p}{1-\lambda} = 1 - \frac{q_r}{\lambda}$ and $\bar{w}_r - \bar{w}_p = Q(\bar{x}_r - \bar{x}_p)$.

Lemma 1: $c_r < c_p$ if only if $q_p < 1 - \lambda$.

Proof: $c_r < c_p \Leftrightarrow \bar{w}_p < \bar{w}_p \Leftrightarrow 0 < \bar{w}_r - \bar{w}_p = Q(\bar{x}_r - \bar{x}_p) \Leftrightarrow 0 < Q$. The last inequality follows from the fact that $\bar{x}_r > \bar{x}_p$. Then the last statement is equivalent to $q_p < 1 - \lambda$. This completes the proof.

Next, I will give some preliminary results. I will use these results in the proofs later.

Lemma 2: The maximum of $\frac{d}{dq_r}[\frac{q_r Q}{1-\beta Q}]$ $(\frac{d}{dq_p}[\frac{q_p Q}{1-\beta Q}])$is $\frac{1}{1-\beta}$ when $q_r = 0$ $(q_p = 0)$and its minimum is -1 when $q_r = \lambda$ $(q_p = \lambda)$.

Proof: To see this result, compute the following: $\frac{d^2}{dq_r^2}[\frac{q_r Q}{1-\beta Q}] = -\frac{2}{\lambda}\frac{1}{(1-\beta Q)^2} - \frac{2}{\lambda}\frac{\beta}{(1-\beta Q)^3} < 0$. So, the maximum of $\frac{d}{dq_r}[\frac{q_r Q}{1-\beta Q}] = \frac{Q}{1-\beta Q} - \frac{q_r}{\lambda}\frac{1}{(1-\beta Q)^2}$ is $\frac{1}{1-\beta}$ when $q_r = 0$ and its minimum is -1

when $q_r = \lambda$. Note that $Q = 1$ when $q_r = 0$ and $Q = 0$ when $q_r = \lambda$. To prove the remaining, note that $\frac{d}{dq_p}[\frac{q_p Q}{1-\beta Q}] = \frac{d}{dq_r}[\frac{q_r Q}{1-\beta Q}]$. This completes the proof.

Stationary Transition Patterns

Stable Autocracy, A(τ) : The regime remains autocratic. The rich sets the tax rate at 0 in a good time, and at $\tau \geq 0$ in a bad time. The value functions along this transition path can be calculated as follows:

$$
\begin{aligned}
V_i(A,0) &= \bar{w}_i + \beta[q_i W_j(A) + (1-q_i)W_i(A)], \\
V_i(A,\tau) &= V_i(A,0) - \bar{w}_i + \bar{Y}_i^d(\tau) \\
&= V_i(A,0) - \tau(\bar{w}_i - (1-c)\bar{w}), \\
W_i(A) &= \pi V_i(A,\tau) + (1-\pi)V_i(A,0) \\
&= V_i(A,0) - \pi\tau(\bar{w}_i - (1-c)\bar{w}).
\end{aligned}
$$

Solving this equation system gives the following value functions that I will use later:

$$
\begin{aligned}
V_r(A,0) &= \frac{1}{1-\beta}\{\bar{w}_r - \beta\pi\tau(\bar{w}_r - (1-c)\bar{w}) - \frac{\beta q_r(1-\pi\tau)}{1-\beta Q}(\bar{w}_r - \bar{w}_p)\} \\
V_p(A,0) &= \frac{1}{1-\beta}\{\bar{w}_p - \beta\pi\tau(\bar{w}_p - (1-c)\bar{w}) + \frac{\beta q_p(1-\pi\tau)}{1-\beta Q}(\bar{w}_r - \bar{w}_p)\} \text{ and} \\
V_p(A,\tau) &= \frac{1}{1-\beta}\{\bar{w}_p - \tau(1-\beta(1-\pi))(\bar{w}_p - (1-c)\bar{w}) + \frac{\beta q_p(1-\pi\tau)}{1-\beta Q}(\bar{w}_r - \bar{w}_p)\}.
\end{aligned}
$$

Stable Democracy, D(τ) : In autocracy, the rich sets the tax rate at 0 in a good time and extends the franchise in a bad time, then the poor sets the tax rate at 1. In democracy, the poor sets the tax rate at 1 in a good time, and at $\tau \leq 1$ in a bad time. Once the regime switches to democracy, no coup occurs and the regime remains democratic. The value functions along this transition path can be calculated as follows:

$$
\begin{aligned}
V_i(A,0) &= \bar{w}_i + \beta[q_i W_j(A) + (1-q_i)W_i(A)], \\
W_i(A) &= \pi V_i(D,1) + (1-\pi)V_i(A,0), \\
V_i(D,1) &= (1-c)\bar{w} + \beta[q_i W_j(D) + (1-q_i)W_i(D)], \\
V_i(D,\tau) &= \bar{Y}_i^d(\tau) + \beta[q_i W_j(D) + (1-q_i)W_i(D)] = V_i(D,1) + \bar{Y}_i^d(\tau) - (1-c)\bar{w} \\
W_i(D) &= \pi V_i(D,\tau) + (1-\pi)V_i(D,1) = V_i(D,1) + \pi[\bar{Y}_i^d(\tau) - (1-c)\bar{w}],
\end{aligned}
$$

I will use the following later:

$$
\begin{aligned}
V_r(A,0) = & \frac{1}{1-\beta(1-\pi)}\{\bar{w}_r + \beta\pi V_r(D,1) \\
& - \frac{q_r}{1-\beta Q(1-\pi)}((1-\pi)(\bar{w}_r - \bar{w}_p) + \pi[V_r(D,1) - V_p(D,1)])\}, \\
V_r(D,1) = & \frac{1}{1-\beta}\{(1-c)\bar{w} + \beta\pi(1-\tau)[(\bar{w}_r - (1-c)\bar{w}) \\
& - \frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)]\}
\end{aligned}
$$

Unstable Regime, AD : In autocracy, the rich sets $\tau = 0$ in a good time and extends the franchise in a bad time, then the poor sets $\tau = 1$. In democracy, the poor sets $\tau = 1$ in a good time. In a bad time under democracy, the rich attempts a coup, and the regime switches to autocracy, then the rich sets $\tau = 0$. The payoffs on the equilibrium path can be calculated as:

$$
\begin{aligned}
V_i(A,0) &= \bar{w}_i + \beta[q_i W_j(A) + (1-q_i)W_i(A)], \\
W_i(A) &= \pi V_i(D,1) + (1-\pi)V_i(A,0), \\
V_i(D,1) &= (1-c)\bar{w} + \beta[q_i W_j(D) + (1-q_i)W_i(D)], \\
W_i(D) &= \pi[V_i(A,0) - \frac{\phi_{coup}}{\beta}] + (1-\pi)V_i(D,1).
\end{aligned}
$$

Lemma 3: Along the transition path D(τ), **(i)** $\frac{d}{d\tau}(V_r(D,1) - V_p(D,1)) < 0$, **(ii)** $\frac{dV_r(D,1)}{d\tau} < 0$ and **(iii)** $\frac{dV_r(D,\tau)}{d\tau} < 0$.

Proof: Compute the following $V_r(D,1) - V_p(D,1) = \frac{\beta Q\pi}{1-\beta Q}(1-\tau)(\bar{w}_r - \bar{w}_p)$. Then $\frac{d}{d\tau}(V_r(D,1) - V_p(D,1)) = -\frac{\beta Q\pi}{1-\beta Q}(\bar{w}_r - \bar{w}_p) < 0$, which is (i). To show result (ii), use $V_r(D,1)$:

$$V_r(D,1) = \frac{1}{1-\beta}\{(1-c)\bar{w} + \beta\pi(1-\tau)[(\bar{w}_r - (1-c)\bar{w}) - \frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)]\}$$

so that $\frac{dV_r(D,1)}{d\tau} = \frac{\beta\pi}{1-\beta}\{-(\bar{w}_r - (1-c)\bar{w}) + \frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)\}$. Now I will show that $\frac{dV_r(D,1)}{d\tau} < 0$ for all $q_r < \lambda$. Note that

$$\frac{d}{dq_r}(\frac{dV_r(D,1)}{d\tau}) = \frac{\beta\pi}{1-\beta}\{\frac{d}{dq_r}((1-c)\bar{w} - \bar{w}_r) + \frac{d}{dq_r}(\frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p))\}.$$

Compute these derivatives. First, $\frac{d}{dq_r}((1-c)\bar{w} - \bar{w}_r) = -\frac{d\bar{w}_r}{dq_r} = (\bar{x}_r - \bar{x}_p)$. Next, $\frac{d}{dq_r}(\frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)) = [\frac{q_r}{1-\beta Q}]'(\bar{w}_r - \bar{w}_p) + \frac{q_r}{1-\beta Q}[\bar{w}_r - \bar{w}_p]'$ where $[\,]'$ denotes derivative with respect to q_r. Note that $\bar{w}_r - \bar{w}_p = Q(\bar{x}_r - \bar{x}_p)$, $\bar{x}_r - \bar{x}_p = \frac{\lambda-\theta}{\lambda(1-\lambda)}$. Substitute $Q = 1 - \frac{q_r}{\lambda}$. Then $[\frac{q_r}{1-\beta Q}]' = \frac{1-\beta}{(1-\beta Q)^2}$ and $[\bar{w}_r - \bar{w}_p]' = -\frac{1}{\lambda}(\bar{x}_r - \bar{x}_p)$ so that $\frac{d}{dq_r}(\frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)) = \frac{(\bar{x}_r - \bar{x}_p)}{(1-\beta Q)}[\frac{(1-\beta)Q}{1-\beta Q} - \frac{q_r}{\lambda}]$. Now note the following: $[\frac{Q}{1-\beta Q}]' = -\frac{1}{\lambda}\frac{1}{1-\beta Q} < 0$ so that $[\frac{(1-\beta)Q}{1-\beta Q} - \frac{q_r}{\lambda}]' < 0$. Also $(1-\beta Q)' = \frac{\beta}{\lambda} > 0$. Then $\frac{d}{dq_r}(\frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p))$ attains its minimum at $q_r = \lambda$. Noting that $Q = 0$ when $q_r = \lambda$, this minimum is equal to $-(\bar{x}_r - \bar{x}_p)$. Then

$$\frac{d}{dq_r}(\frac{dV_r(D,1)}{d\tau}) \geq \frac{\beta\pi}{1-\beta}\{(\bar{x}_r - \bar{x}_p) - (\bar{x}_r - \bar{x}_p)\} = 0.$$

So the maximum of $\frac{dV_r(D,1)}{d\tau}$ is attained when $q_r = \lambda$. First note that $\bar{w}_r = \bar{w}_p = \bar{w}$ when $q_r = \lambda$. Then $\frac{dV_r(D,1)}{d\tau} = -c\bar{w} < 0$ when $q_r = \lambda$ so that $\frac{dV_r(D,1)}{d\tau} < 0$ for all $q_r = \lambda$. Since $\bar{Y}_r^d(\tau)$ is a decreasing function of τ, this result immediately implies that $\frac{dV_r(D,\tau)}{d\tau} < 0$. This completes the proof of (iii).

Note that I use the derivatives with respect to q_r just to prove these results for all values of q_r. I will keep q_r constant in equilibrium. Then I will compare different equilibria for different values of q_r later.

Lemma 4: Along the transition path A(τ), $\frac{dV_r(A,0)}{d\tau} < 0$ and $\frac{dV_r(A,\tau)}{d\tau} < 0$.

Proof: Note that

$$V_r(A,0) = \frac{1}{1-\beta}\{\bar{w}_r - \beta\pi\tau(\bar{w}_r - (1-c)\bar{w}) - \frac{\beta q_r(1-\pi\tau)}{1-\beta Q}(\bar{w}_r - \bar{w}_p)\}.$$

Then $\frac{dV_r(A,0)}{d\tau} = \frac{\beta\pi}{1-\beta}[-(\bar{w}_r - (1-c)\bar{w}) + \frac{q_r Q}{1-\beta Q}(\bar{x}_r - \bar{x}_p)]$. Note that $\frac{dV_r(A,0)}{d\tau} < 0$ when $q_r = 0$ and $q_r = \lambda$. To show that $\frac{dV_r(A,0)}{d\tau} < 0$ all the time, I will show that $\frac{d}{dq_r}(\frac{dV_r(A,0)}{d\tau}) \geq 0$ so that $\frac{dV_r(A,0)}{d\tau}$ is monotone in q_r. Then $\frac{dV_r(A,0)}{d\tau} < 0$ follows: $\frac{d}{dq_r}(\frac{dV_r(A,0)}{d\tau}) = \frac{\beta\pi}{1-\beta}(\bar{x}_r - \bar{x}_p)\{1 + [\frac{q_r Q}{1-\beta Q}]'\}$. From Result 1, the minimum of $[\frac{q_r Q}{1-\beta Q}]'$ is -1 when $q_r = \lambda$. Substituting its minimum value above, one obtains $\frac{d}{dq_r}(\frac{dV_r(A,0)}{d\hat{\tau}_r}) \geq 0$. Noting that $\frac{d\bar{Y}_r^d(\tau)}{d\tau} < 0$, this result implies that $\frac{dV_r(A,\tau)}{d\tau} < 0$. This completes the proof.

I will use these results in my characterization proofs. First, in good times under autocracy, there is no threat of a revolution. Then, the rich chooses between setting the tax rate at $\tau_r = 0$ and extending franchise. The next proposition states that the rich always prefers the former to the latter.

Proposition 7: In good times, the rich prefers to keep the autocracy and sets the tax rate at zero for the next period.

Proof: Remember that $\tau_r = 0$ and $\tau_p = 1$ since $c_p > c > c_r$. In contrary, suppose that the rich prefers to extend the franchise in good times. Then, he does so in bad times as well. Because: (i) This preference ordering over future distribution is independent of the current state of the economy. (ii) Furthermore, if the poor revolts even when the tax rate is set to τ_p, then extending franchise in bad times prevents a revolution. If the rich prefers to extend the franchise in good times, then the rich never attempts a costly coup under democracy. So, once the rich extends the franchise, the regime stays democratic forever, and the tax rate is set to $\tau_p = 1$ in all states. Then, every agent has the same expected disposable income, $(1-c)\bar{w}$ every period. In turn, the expected payoff of extending the franchise is given by $\frac{(1-c)\bar{w}}{1-\beta}$. The alternative of the rich is not to extend the franchise (i.e. $franchise = 0$) today and set the tax rate at $\tau_r = 0$. By our supposition and the arguments above, the regime will switch to democracy next period whether it is a good time or a bad time. So, the expected utility of the alternative action for today's rich is $q_r \bar{x}_p + (1-q_r)\bar{x}_r + \beta\frac{(1-c)\bar{w}}{1-\beta}$. By our supposition, the rich prefers extending the franchise, i.e. $\frac{(1-c)\bar{w}}{1-\beta} \geq q_r\bar{x}_p + (1-q_r)\bar{x}_r + \beta\frac{(1-c)\bar{w}}{1-\beta}$, which is equivalent to $q_r \geq \frac{\bar{x}_r-(1-c)\bar{w}}{\bar{x}_r-\bar{x}_p}$. Substituting $q_r = \frac{\lambda}{1-\lambda}q_p$, $\bar{x}_p = \frac{\theta}{\lambda}\bar{w}$ and $\bar{x}_r = \frac{1-\theta}{1-\lambda}\bar{w}$, we obtain $q_p \geq (1-\lambda)(1+\frac{c(1-\lambda)}{\lambda-\theta}) > 1-\lambda$. The last inequality follows from $\lambda > \theta$. This contradicts with my assumption that $q_p < 1-\lambda$. This completes the proof.

This proposition implies that if the regime ever switches from autocracy to democracy, this happens during bad times under autocracy.

The regime can switch from democracy to autocracy only if there is a coup. Under democracy, there is no coup threat during good times. Thus, no political transition occurs during good times under democracy. The poor optimally sets the tax rate at 1 in good times. If the regime ever switches from democracy to autocracy, this happens during bad times under democracy.

In bad times, setting the tax rate at $\tau_p = 1$ under democracy may trigger a coup. In order to avoid a coup, the poor may lower the tax rate. In this case, the poor faces two options: (i) set a high tax rate and trigger a coup, (ii) or lower the tax rate and prevent a coup. Because of social mobility, it is not obvious which option the poor prefers. The next proposition states that there does not exist any equilibrium in which the poor prefers to trigger a coup even though he can prevent it.

Proposition 8: There does not exist any equilibrium in which (i) the regimes switches to democracy, (ii) there exists a tax rate that prevents a coup in a bad time during democracy, (iii) yet the poor prefers to trigger a coup.

Proof: In contrary, suppose that there exists an equilibrium in which (i) the regime switches to democracy, (ii) there exists a tax rate $\hat{\tau}_d < 1$ that prevents a coup in a bad time during democracy, (iii) yet the poor prefers to trigger a coup. Then the transition pattern AD is observed along this equilibrium path. The equation system that solves for the values along the equilibrium path was given before.

Consider a one-period deviation by the poor: Set the tax rate at $\hat{\tau}_d$ if it is a bad time today.

Compute the value of this action: $V_i(D,\hat{\tau}_d) = \bar{Y}_i^d(\hat{\tau}_d) + \beta[q_i W_j(D) + (1-q_i)W_i(D)] = \bar{Y}_i^d(\hat{\tau}_d) - (1-c)\bar{w} + V_i(D,1)$. Note that $\hat{\tau}_d$ prevents a coup, i.e. $y_r^d + \beta V_r(D,\hat{\tau}_d) \geq y_r^d - \phi_{coup} + \beta V_r(A,0)$ that is

$$\frac{\phi_{coup}}{\beta} \geq V_r(A,0) - V_r(D,1) - [\bar{Y}_r^d(\hat{\tau}_d) - (1-c)\bar{w}]. \quad (1)$$

By supposition, the poor prefers a coup, i.e. $y_p^d - \phi_{coup} + \beta V_p(A,0) > y_p^d + \beta V_p(D,\hat{\tau}_d)$.Then

$$V_p(A,0) - V_p(D,1) - [\bar{Y}_p^d(\hat{\tau}_d) - (1-c)\bar{w}] > \frac{\phi_{coup}}{\beta}. \quad (2)$$

I will arrive a contradiction by showing that the right hand side of (1) is greater than the left hand side of (2), i.e. equivalently $V_{rAD} - V_{pAD} > \bar{Y}_r^d(\hat{\tau}_d) - \bar{Y}_p^d(\hat{\tau}_d) = (1-\hat{\tau}_d)(\bar{w}_r - \bar{w}_p)$ where $V_{iAD} = V_i(A,0) - V_i(D,1)$. So, compute $V_{rAD} - V_{pAD} = \frac{\bar{w}_r - \bar{w}_p}{1-\beta(1-2\pi)Q}$. This implies that $V_{rAD} - V_{pAD} \geq \bar{w}_r - \bar{w}_p > (1-\hat{\tau}_d)(\bar{w}_r - \bar{w}_p)$, which is the required contradiction. This completes the proof.

Therefore, in any equilibrium, the poor prevents a coup as long as it can.

In bad times under autocracy, setting the tax rate at $\tau_r = 0$ may trigger a revolution. Since the rich loses everything in a revolution, it always wants to prevent it. In order to prevent a revolution, the rich may increase the tax rate or extend the franchise. Because of social mobility, it is not obvious which option the rich prefers. The next proposition states that there does not exist any equilibrium in which the rich prefers to extend the franchise.

Proposition 9: There does not exist any equilibrium in which (i) there exists a tax rate that prevents a revolution in a bad time under autocracy, (ii) yet the rich prefers to extend the franchise.

Proof: In contrary, suppose that there exists an equilibrium in which (i) there exists a tax rate $1 \geq \hat{\tau}_r > 0$ that just prevents a revolution in a bad time under autocracy, (ii) yet the rich prefers to extend the franchise.

In such an equilibrium, there are two possibilities: (1) In future, coup occurs during bad times under democracy; or (2) no coup occurs in future. I will arrive a contradiction in both cases. First note the following: Proposition 7 implies that a transition to democracy occurs only in a bad time under an autocracy. Then,

Case 1: In equilibrium, the stationary pattern AD occurs: In an autocracy, the rich sets $\tau = 0$ in a good time and extends the franchise in a bad time, then the poor sets $\tau = 1$. In a democracy, the poor sets $\tau = 1$ in a good time; the rich attempts a coup in a bad time under democracy, then the regime switches to autocracy and the rich sets $\tau = 0$. Equilibrium behavior implies that (payoff of extending the franchise) > (payoff of not extending the franchise), equivalently

$$V_r(D, 1) > V_r(A, \hat{\tau}_r). \quad (3)$$

Furthermore, Proposition 8 implies that the poor tries to prevent a coup in an equilibrium as long as he can. So, in this equilibrium, even setting $\tau = 0$ cannot prevent a coup in a bad time. That is

$$y_r^d - \phi_{coup} + \beta V_r(A, 0) > y_r^d + \beta V_r(D, 0). \quad (4)$$

The value functions along AD were given before. Note that $V_r(D, 0) = V_r(D, 1) + [\bar{w}_r - (1 - c)\bar{w}]$. Then (4) implies that

$$V_{rAD} - [\bar{w}_r - (1 - c)\bar{w}] > \frac{\phi_{coup}}{\beta} \geq 0 \quad (5)$$

Compute the rich's payoff from the alternative action of setting the tax rate at $\hat{\tau}_r$ and preventing a revolution today: $V_r(A, \hat{\tau}_r) = \bar{Y}_r^d(\hat{\tau}_r) - \bar{w}_r + V_r(A, 0)$. Then $V_r(A, \hat{\tau}_r) - V_r(D, 1) = V_{rAD} + [\bar{Y}_r^d(\hat{\tau}_r) - \bar{w}_r] = V_{rAD} - \hat{\tau}_r[\bar{w}_r - (1 - c)\bar{w}] > 0$ where $V_{iAD} = V_i(A, 0) - V_i(D, 0)$. The last inequality follows from (5). This contradicts with my supposition (3). So, the rich always prefers to keep the autocracy in case 1.

Case 2: Suppose that there exists a tax rate $\hat{\tau}_r$ that prevents a revolution during a bad time under autocracy. Also suppose in contrary that the rich prefers to extend the franchise. Then the following stationary transition pattern D($\hat{\tau}_d$) is observed along the equilibrium path: Under autocracy, the rich sets $\tau = 0$ during good times, and extends the franchise during the first bad time. Then the poor sets $\tau = 1$. The regime never switches back to autocracy. The poor sets the tax rate at 1 during good times and at $\hat{\tau}_d$ during bad times.

Note that $\hat{\tau}_d$ just prevents a coup in equilibrium. The value functions under a stable democracy were computed before. Let V_r and V_p denote $V_r(D,1)$ and $V_p(D,1)$ respectively. Now compute $V_r(A,0)$:

$$V_r(A,0) = \frac{1}{1-\beta(1-\pi)}\{\bar{w}_r + \beta\pi V_r - \frac{\beta q_r}{1-\beta Q(1-\pi)}\{(1-\pi)(\bar{w}_r - \bar{w}_p) + \pi(V_r - V_p)\}.$$

By substituting V_r and $V_r - V_p$, compute $V_r(A,1) - V_r(D,1)$:

$$\begin{aligned} V_r(A,1) - V_r(D,1) &= V_r(A,0) + (1-c)\bar{w} - \bar{w}_r - V_r \\ &= \beta(1-\pi(2-\hat{\tau}_d))(\bar{w}_r - (1-c)\bar{w}) + \Phi\frac{\beta q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p) \end{aligned}$$

where $\Phi = \pi(1-\hat{\tau}_d) + \frac{\gamma}{1-\beta Q(1-\pi)}$ where $\gamma = (1-\beta Q)(1-\pi) - \beta Q\pi^2(1-\hat{\tau}_d)$.

Since $\pi < 0.5$ and $\hat{\tau}_d \leq 1$, $1-\pi(2-\hat{\tau}_d) > 0$. I will also show that $\Phi > 0$. Let primes denote the derivative with respect to q_r. Then $\Phi' = \frac{\gamma'(1-\beta Q(1-\pi)) - \gamma(1-\beta Q(1-\pi))'}{(1-\beta Q(1-\pi))^2}$. Now $\gamma' = \frac{\beta}{\lambda}\{1-\pi+\pi^2(1-\hat{\tau}_d)\}$ so that $\gamma'(1-\beta Q(1-\pi)) - \gamma(1-\beta Q(1-\pi))' = \frac{\beta}{\lambda}\{\pi(1-\pi)+\pi^2(1-\hat{\tau}_d)\} > 0$. Then $\Phi' > 0$. So Φ attains its minimum at $q_r = 0$. Then the minimum value of Φ is $\frac{(1-\beta)(1-\pi+\pi^2(1-\hat{\tau}_d))}{1-\beta(1-\pi)}$ which is greater than zero. So, $V_r(A,1) - V_r(D,1) > 0$. This implies that $V_r(A,\hat{\tau}_r) \geq V_r(A,1) > V_r(D,1)$ which contradicts with my supposition $V_r(A,\hat{\tau}_r) < V_r(D,1)$. This completes the proof of case 2.

Therefore, in any equilibrium, the rich tries to keep the autocracy as long as it can.

The critical values that I define in the text will be crucial in characterizing the equilibrium. The next two propositions, which are given in the main text as well, compare these values.

Proposition 1: $\phi_h > \phi_l$ for all values of q_p.

Proof: Consider the stationary transition pattern D(τ). Define the following: $\alpha(\tau) = V_r(A,0) - V_r(D,\tau) = V_r(A,0) - V_r(D,1) - (\bar{Y}_i^d(\tau) - (1-c)\bar{w})$. That is,

$$\begin{aligned} \alpha(\tau) = &\frac{1}{1-\beta(1-\pi)}\{\bar{w}_r - (1-\beta)V_r(D,1) \\ &- \frac{q_r}{1-\beta Q(1-\pi)}((1-\pi)(\bar{w}_r - \bar{w}_p) + \pi[V_r(D,1) - V_p(D,1)])\} \\ &- (\bar{Y}_i^d(\tau) - (1-c)\bar{w}). \end{aligned}$$

Then

$$\frac{d\alpha}{d\tau} = -\frac{1}{1-\beta(1-\pi)}\{(1-\beta)\frac{dV_r(D,1)}{d\tau} + \frac{\pi q_r}{1-\beta Q(1-\pi)}\frac{d}{d\tau}(V_r(D,1)-V_p(D,1))\} - \frac{d\bar{Y}_i^d(\tau)}{d\tau}$$

Then $\frac{d\alpha}{d\tau} > 0$. The last inequality follows from Lemma 3 and $\frac{d\bar{Y}_i^d(\tau)}{d\tau} < 0$. Now, note that $\phi_l = \beta\alpha(0)$ and $\phi_h = \beta\alpha(1)$. So, $\phi_l < \phi_h$. This completes the proof.

Proposition 2: $\psi_0 - \psi_1$ is a decreasing function of q_p. Furthermore, $\psi_0 > \psi_1$ for small values of q_p and $\psi_0 < \psi_1$ for large values of q_p.

Proof: Consider the stationary transition pattern A(τ). Using the value function $V_p(A,\tau)$ under A(τ), we can easily compute the following:

$$\psi_0 - \psi_1 = \frac{\beta}{1-\beta}\{(1-\beta(1-\pi))((1-c)\bar{w}-\bar{w}_p) - \frac{\beta\pi q_p}{1-\beta Q}(\bar{w}_r-\bar{w}_p)\}.$$

When $q_p = 0$, $\psi_0 - \psi_1 > 0$ since $(1-c)\bar{w} > \bar{w}_p$. Let q_p be such that $(1-c)\bar{w} = \bar{w}_p$. Then $\psi_0 - \psi_1 < 0$. Furthermore, $\frac{d(\psi_0-\psi_1)}{dq_p} = -\frac{\beta(\bar{x}_r-\bar{x}_p)}{1-\beta}\{1-\beta(1-\pi)+\beta\pi[\frac{q_pQ}{1-\beta Q}]'\}$ where $[]'$ denotes the derivative with respect to q_p. Using Lemma 2, substitute $[\frac{q_pQ}{1-\beta Q}]'$ with -1, then $\frac{d(\psi_0-\psi_1)}{dq_p} < -\frac{\bar{x}_r-\bar{x}_p}{1-\beta}\{1-\beta(1-\pi)-\beta\pi\} = -(\bar{x}_r-\bar{x}_p) < 0$. This completes the proof.

The next two proposition will be crucial in showing the existence of equilibrium.

Proposition 10: Assume that $\psi_h > \psi_{rev} \geq \psi_l$. For any $\hat{\tau}_r \in [0,1]$, consider the following transition pattern A($\hat{\tau}_r$): The regime remains authoritarian, the rich sets the tax rate at 0 during good times and at $\hat{\tau}_r$ during bad times. Then there exists a unique $\hat{\tau}_r \in [0,1]$ such that $\beta V_p(A,\hat{\tau}_r) = -\psi_{rev} + \beta V_p(Rev,0)$ along A($\hat{\tau}_r$).

Proof: The existence of unique $\hat{\tau}_r$ is guaranteed by the following observations: Under a stable autocracy, (i) $V_p(A,\tau)$ is increasing in τ when $\psi_h > \psi_{rev} \geq \psi_l$, (ii) $\hat{\tau}_r = 0$ when $\psi_{rev} = \psi_h$, and (iii) $\hat{\tau}_r = 1$ when $\psi_{rev} = \psi_l$.

To see (i), note that along A(τ), $\frac{dV_p(A,\tau)}{d\tau} = \frac{\beta}{1-\beta}\{(1-\beta(1-\pi))((1-c)\bar{w}-\bar{w}_p) - \frac{\beta\pi q_p}{1-\beta Q}(\bar{w}_r - \bar{w}_p)\} = \psi_0 - \psi_1$. Furthermore, $\psi_0 - \psi_1 > 0$ since $\psi_h > \psi_l$. (ii) and (iii) follow from $\psi_h >$

$\psi_{rev} \geq \psi_l$ and the definitions of ψ_h and ψ_l. This completes the proof.

That is, $\hat{\tau}_r$ is the tax rate that just prevents a revolution along this transition pattern. So, if any A(τ) occurs in an equilibrium, the tax rate that will be chosen by the rich in this equilibrium will be $\hat{\tau}_r$.

Proposition 11: Assume that $\phi_h > \phi_{coup} \geq \phi_l$. For any $\hat{\tau}_d \in [0,1]$, consider the following transition pattern D($\hat{\tau}_d$): Under autocracy, the rich sets the tax rate at 0 in a good time and extends franchise in a bad time. Once the regime switches to democracy, it remains democratic, the poor sets the tax rate at 1 in good times and at $\hat{\tau}_d$ in bad times. Then there exists a unique $\hat{\tau}_d \in [0,1]$ such that $\beta V_r(D, \hat{\tau}_d) = -\phi_{coup} + \beta V_r(A, 0)$ along D($\hat{\tau}_d$).

Proof: Along any D($\hat{\tau}_d$), I have the following: $\frac{d}{d\hat{\tau}_d}(V_r(A,0) - V_r(D,\hat{\tau}_d)) = \frac{1}{1-\beta(1-\pi)}\{(1-\beta(1-2\pi))[\bar{w}_r - (1-c)\bar{w}] - \frac{\beta\pi q_r}{1-\beta(1-\pi)Q}(\bar{w}_r - \bar{w}_p)\}$. Note that this derivative is positive when $q_r = 0$ and $q_r = \lambda$. If I can show that it is monotone in q_r, then this implies that it is positive for all q_r. To see this, compute the following: $\frac{d}{dq_r}(\frac{d}{d\hat{\tau}_d}(V_r(A,0) - V_r(D,\hat{\tau}_d))) = -(\bar{x}_r - \bar{x}_p)\{1-\beta(1-2\pi)+\beta\pi\frac{d}{dq_r}[\frac{q_r Q}{1-\beta(1-\pi)Q}]\} \leq -(\bar{x}_r - \bar{x}_p)\{1-\beta(1-2\pi)-\beta\pi\} < 0$. The first inequality follows from Lemma 2: Just rename $\tilde{\beta} = \beta(1-\pi)$ in Lemma 2, then the minimum of $\frac{d}{dq_r}[\frac{q_r Q}{1-\beta(1-\pi)Q}]$ is -1. The second inequality follows from $\bar{x}_r - \bar{x}_p > 0$. So, $\frac{d}{d\hat{\tau}_d}(V_r(A,0) - V_r(D,\hat{\tau}_d)) > 0$ for all q_r. Now, remember that $\frac{\phi_{coup}}{\beta} = V_r(A,0) - V_r(D,\hat{\tau}_d)$. By definition of ϕ_l, $\hat{\tau}_d = 0$ when $\phi_{coup} = \phi_l$ and $\hat{\tau}_d = 1$ when $\phi_{coup} = \phi_h$. Since $\frac{d}{d\hat{\tau}_d}(V_r(A,0) - V_r(D,\hat{\tau}_d)) > 0$, there exists a unique $\hat{\tau}_d \in [0,1]$ that satisfies (1) when $\phi_h > \phi_{coup} \geq \phi_l$.

That is, $\hat{\tau}_d$ is the tax rate that just prevents a coup along this transition pattern. So, if any D(τ) occurs in an equilibrium, the tax rate that will be chosen by the poor in this equilibrium will be $\hat{\tau}_d$.

Proof of Theorem 4:

1. When $c > c_p$, there is no conflict over redistribution. Both the rich and the poor prefer no redistribution. So, the rich extends the franchise and the poor sets the tax rate at zero on the equilibrium path.

2. When $\psi_{rev} \geq \psi_h$, the poor does not revolt if the rich sets the tax rate at zero all the time. Then the proof that the rich prefers to set the tax rate to zero rather than extend the franchise is similar to the proof of Proposition 7.

3. By Proposition 10, there exists a unique $\hat{\tau}_r \in [0,1]$ such that $\beta V_p(A, \hat{\tau}_r) = -\psi_{rev} + \beta V_p(Rev, 0)$ along A($\hat{\tau}_r$). In order A($\hat{\tau}_r$) to be an equilibrium path, I need to show that the rich prefers to set the tax rate at $\hat{\tau}_r$ rather than extend the franchise in a bad time under autocracy given that the rich of future will prefer autocracy to democracy (or in other words, given that the regime will remain autocratic in future if today's rich does not extend the franchise). First consider the following case: If the rich extends the franchise than the regime remains democratic in the equilibrium of the subgame. Then the poor optimally sets the tax rate at 1 in good times and at $\hat{\tau}_d$ in bad times, $\hat{\tau}_d$ as given as in Proposition 11.

Lemma 4 states that when $V_r(A, \tau)$ is calculated along A(τ), $V_r(A, \tau)$ is decreasing in τ. So, along a stable autocracy, the *worst* payoff for the rich achieved when $\hat{\tau}_r = 1$ along A($\hat{\tau}_r$). This payoff is given by

$$V_r(A, 1) = \frac{1}{1-\beta}\{(1-c)\bar{w} + \beta(1-\pi)[(\bar{w}_r - (1-c)\bar{w}) - \frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)]\}.$$

On the other hand, Lemma 3 states that when $V_r(A, 1)$ is calculated along D(τ), $V_r(A, 1)$ is decreasing in τ. So, along a stable democracy, the *best* payoff for the rich is achieved when $\hat{\tau}_d = 0$ along D($\hat{\tau}_d$). This payoff is given by

$$V_r(D, 1) = \frac{1}{1-\beta}\{(1-c)\bar{w} + \beta\pi[(\bar{w}_r - (1-c)\bar{w}) - \frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)\}\}.$$

Using these values, note that $V_r(A, 1) - V_r(D, 1) = \frac{\beta(1-2\pi)}{1-\beta}\Gamma(q_r)$ where $\Gamma(q_r) = (\bar{w}_r - (1 - c)\bar{w}) - \frac{q_r}{1-\beta Q}(\bar{w}_r - \bar{w}_p)$. Then $\Gamma(q_r) > 0$ implies $V_r(A, 1) > V_r(D, 1)$. To see that $\Gamma(q_r) > 0$, compute the following: $\frac{d\Gamma}{dq_r} = -(\bar{x}_r - \bar{x}_p)\{1 + [\frac{q_r Q}{1-\beta Q}]'\}$ where $[]'$ denotes the derivative with respect to q_r. From Lemma 2, the minimum of $[\frac{q_r Q}{1-\beta Q}]'$ is -1 when $q_r = \lambda$. Then the maximum of $\frac{d\Gamma}{dq_r}$ is equal to zero when $q_r = \lambda$ so that $\frac{d\Gamma}{dq_r} < 0$ for all $q_r < \lambda$. Then the minimum of Γ is attained when $q_r = \lambda$. This value is equal to $c\bar{w} > 0$. So, $\Gamma(q_r) > 0$ for all $q_r < \lambda$. This completes the proof of $V_r(A, 1) > V_r(D, 1)$. That is, the rich prefers the autocracy with the worst payoff for him to the democracy with the best payoff for him. Then I can generalize this for any $\hat{\tau}_r$ and $\hat{\tau}_d$ by applying Lemmas 3 and 4.

Next consider the following case: If the rich extends the franchise than the rich attempts a coup in a bad time under democracy in the equilibrium of the subgame. Then the poor optimally sets the tax rate at 1 in good times, the rich attempts a coup and the regime switches back to autocracy in a bad time. If the rich of today prefers to extend the franchise in a bad time under autocracy, then the rich of future prefers to extend the franchise in a bad time under autocracy as well. This contradicts with the hypothesis that the rich of future will prefer autocracy to democracy. This completes the proof.

4. When $\phi_{coup} \geq \phi_h$, I have the following along D($\hat{\tau}_d = 1$): $\beta V_r(D, \hat{\tau}_d) \geq -\phi_{coup} + \beta V_r(A, 0)$. This follows from the definition of ϕ_h. Then, this case is a special case of (5) with $\hat{\tau}_d = 1$ below.

5. Since $\psi_{rev} < \psi_l$, there does not exist a tax rate that prevents a revolution. Then the rich extends the franchise in a bad time under autocracy. By Proposition 11, there exists a unique $\hat{\tau}_d \in [0, 1]$ such that $\beta V_r(D, \hat{\tau}_d) = -\phi_{coup} + \beta V_r(A, 0)$ along D($\hat{\tau}_d$). In order D($\hat{\tau}_d$) to be an equilibrium path, I need to show that the poor prefers to set the tax rate at $\hat{\tau}_d$ rather than trigger a coup during a bad time under democracy given that the poor of future will prefer to do so as well. Then the poor optimally sets the tax rate at 1 in good times and at $\hat{\tau}_d$ in bad times, $\hat{\tau}_d$ as given as in Proposition 11.

Consider the values generated along D($\hat{\tau}_d$). In order for this pattern to be realized in an equilibrium, two conditions must be satisfied: (1) $\hat{\tau}_d$ just prevents a coup in a bad time under democracy: $\beta V_r(D, \hat{\tau}_d) = -\phi_{coup} + \beta V_r(A, 0)$, i.e. $\frac{\phi_{coup}}{\beta} = V_r(A, 0) - V_r(D, \hat{\tau}_d)$; (2) the poor prefers democracy to a coup, i.e. $\beta V_p(D, \hat{\tau}_d) \geq -\phi_{coup} + \beta V_p(A, 0)$ i.e. $\frac{\phi_{coup}}{\beta} \geq V_p(A, 0) - V_p(D, \hat{\tau}_d)$.

(1) is guaranteed by Proposition 11. In contrary, suppose that (2) is not satisfied along

this stationary transition path, i.e. $\frac{\phi_{coup}}{\beta} < V_p(A,0) - V_p(D,\hat{\tau}_d)$. Equivalently,

$$V_r(A,0) - V_r(D,\hat{\tau}_d) < V_p(A,0) - V_p(D,\hat{\tau}_d)$$

Now, this will yield a contradiction. Rewrite the above inequality: $V_r(A,0) - V_r(D,\hat{\tau}_d) < V_p(A,0) - V_p(D,\hat{\tau}_d) \Leftrightarrow \hat{\tau}_d(\bar{w}_r - \bar{w}_p) < \beta Q(W_{rAD} - W_{pAD})$ where $W_{iDA} \equiv W_i(D) - W_i(A)$. On the left hand side, we have $\hat{\tau}_d(\bar{w}_r - \bar{w}_p) \geq 0$. However, on the right hand side, $W_{rDA} - W_{pDA} = -\frac{(1-\pi)-\pi(1-\hat{\tau}_d)}{1-\beta Q(1-\pi)}(\bar{w}_r - \bar{w}_p) < 0$. The last inequality follows from $\pi < 0.5$ and $\bar{w}_r > \bar{w}_p$. This gives the required contradiction. In turn, this proves that given that the poor of future will prevent a coup, today's poor will prevent a coup by setting the tax rate at $\hat{\tau}_d$ in a bad time as well. This completes the proof.

6. Since $\psi_{rev} < \psi_l$, there does not exist a tax rate that prevents a revolution. Then the rich extends the franchise in a bad time under autocracy. He optimally sets the tax rate at zero in a good time under autocracy. Since $\phi_{coup} < \phi_l$, there does not exist a tax rate that prevents a coup. The rich attempts a coup in a bad time under democracy, then sets the tax rate at zero. The poor optimally sets the tax rate at one in a good time under democracy. This completes the proof.

Proposition 3: $\frac{d\phi_l}{dq_p} < 0$.

Proof: Note that $\phi_l = \beta\left[V_r(A,0) - V_r(D,0)\right]$ where the value functions are computed along D(0):

$$\frac{1}{\beta}[V_r(A,0) - V_r(D,0)] = \frac{1}{1-\beta(1-\pi)}\{-(1-2\pi)(1-c)\bar{w} + \Omega\}$$

where $\Omega = \frac{1-2\pi}{1-\beta Q(1-\pi)}\{[1-\beta Q(1-\pi) - q_r]\bar{w}_r + q_r\bar{w}_p\}$. To simplify the calculations later, let $\Pi = \frac{\Omega}{1-2\pi}$, $\xi = 1-\beta Q(1-\pi)$ and $\gamma = [1-\beta Q(1-\pi) - q_r]\bar{w}_r + q_r\bar{w}_p = [\xi - q_r]\bar{w}_r + q_r\bar{w}_p$, then $\Pi = \frac{\gamma}{\xi} = \frac{1}{\xi}\{[\xi - q_r]\bar{w}_r + q_r\bar{w}_p\}$. Let Π', ξ' and Ω' denote the derivatives with respect to q_p. Using $\gamma = \xi\Pi$, we have $\gamma' = \xi'\Pi + \xi\Pi'$, that is $\Pi' = \frac{\gamma' - \xi'\Pi}{\xi}$. Since $\xi > 0$ and $\pi < 0.5$, we have $sign(\phi_l') = sign(\Omega') = sign(\Pi') = sign(\gamma' - \xi'\Pi)$.

Compute the following: $\gamma' - \xi'\Pi = \frac{\bar{x}_r - \bar{x}_p}{\xi(1-\lambda)}\{-\xi\lambda[1 + (1-\beta(1-\pi))Q] + q_r\}$. Let $\Delta(q_p) = -\xi\lambda[1 + (1-\beta(1-\pi))Q] + q_r$. Then $\Delta(q_p = 1-\lambda) = 0$. If I can show that $\frac{d\Delta}{dq_p} > 0$, then this implies that $\Delta(q_p) < 0$ for all $q_p < 1-\lambda$. In turn, $sign(\gamma' - \xi'\Pi) < 0$. Just note that $\frac{d\Delta}{dq_p} = \frac{2\lambda\xi}{1-\lambda}(1-\beta(1-\pi)) > 0$. This completes the proof.

Proposition 4: $\frac{d\phi_h}{dq_p} < 0$.

Proof: First, when $\phi_{coup} = \phi_h$, once the regime switches to democracy, it remains democratic and the poor always sets $\tau = 1$. Then, every agent has the same expected disposable income, $(1-c)\bar{w}$, every period. In turn, the expected payoff of extending the franchise is given by $\frac{(1-c)\bar{w}}{1-\beta}$. That is, $V_i(D,1) = \frac{(1-c)\bar{w}}{1-\beta}$ for $i \in \{p,r\}$. Also $\phi_h = \beta\left[V_r(A,0) - V_r(D,1)\right]$ where $V_r(A,0)$ is calculated along D(1). So, $\frac{d\phi_h}{dq_p} = \beta\frac{dV_r(A,0)}{dq_p}$. Using the equation system for D(1), one can solve for $V_r(A,0)$:

$$V_r(A,0) = \frac{1}{1-\beta(1-\pi)}\{\bar{x}_r + \beta\pi\frac{(1-c)\bar{w}}{1-\beta} - \frac{q_r}{1-\beta Q(1-\pi)}(\bar{x}_r - \bar{x}_p)\}.$$

Now substituting $q_r = \frac{\lambda}{1-\lambda}q_p$, one can compute $\frac{dV_r(A,0)}{dq_p} = -\frac{\lambda}{1-\lambda}\frac{1-\beta(1-\pi)}{[1-\beta Q(1-\pi)]^2} < 0$. This completes the proof.

Proposition 5: $\frac{dc_p}{dq_p} < 0$.

Proof: Note that $c_p = 1 - \frac{\bar{w}_p}{\bar{w}}$ where $\bar{w}_p = q_p\bar{x}_r + (1-q_p)\bar{x}_p$. Then $\frac{dc_p}{dq_p} = -\frac{\bar{x}_r - \bar{x}_p}{\bar{w}} = -\frac{\lambda-\theta}{\lambda(1-\lambda)} < 0$ since $\lambda > \theta$.

Proposition 6: $\frac{d\psi_l}{dq_p} < 0$.

Proof: In order to prove this result, I will show that both ψ_0 and ψ_1 are decreasing functions of q_p. The value function $V_p(A,\tau)$ under a stable autocracy A(τ) has been calculated before. $\tau = 0$ in $V_p(A,\tau)$ in calculation of ψ_0, and $\tau = 1$ in $V_p(A,\tau)$ in calculation of ψ_1. Note that $\frac{dV_p(A,\tau)}{dq_p} = \frac{\bar{x}_r - \bar{x}_p}{1-\beta}\{1 - \tau(1-\beta(1-\pi)) + [\frac{\beta q_p(1-\pi\tau)}{1-\beta Q}]'\}$. Also, $sign(\frac{d\psi_\tau}{d\tau}) = -sign(\frac{dV_p(A,\tau)}{dq_p})$ for $\tau \in \{0,1\}$. For ψ_0, note that $\frac{dV_p(A,0)}{dq_p} = \frac{\bar{x}_r - \bar{x}_p}{1-\beta}\{1 + \beta[\frac{q_pQ}{1-\beta Q}]'\} > 0$. For ψ_1, note that $\frac{dV_p(A,1)}{dq_p} = \frac{\bar{x}_r - \bar{x}_p}{1-\beta}\beta(1-\pi)\{1 + [\frac{q_pQ}{1-\beta Q}]'\} > 0$. The inequalities follow from the fact that the minimum value of $[\frac{q_pQ}{1-\beta Q}]'$ is -1 (Lemma 2). This completes the proof.

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