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Bahar Leventoglu
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SOCIAL MOBILITY AND POLITICAL TRANSITIONS

Bahar Leventoğlu

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.

KEY WORDS: democratization • game theory • political transitions • social mobility

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 (1 September 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 (17 November 2002) argues that ‘the impoverished masses see little hope of success in systems dominated by tiny, rich elites’ in Latin American countries. A letter to the Editor of the Financial Times (25 February 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

1. Social mobility is a key issue in public debates in developed countries as well. For example, Stephen Pollard (10 April 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 straightforward concept of social mobility’. Paul Krugman (22 November 2002) argues that ‘the inherited status is making a comeback’ in the US today and making the gap between the upper class and the middle class increasingly harder to cross.
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 Ök, 2001). Benabou and Ök (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 (Acemoglu and Robinson, 2000, 2001; Rosendorff, 2001). Both Acemoglu 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 affects political transitions. To present my arguments in a theoretical framework, I build a political economy model of regime transitions upon Acemoglu and Robinson (2001) by incorporating social mobility as a key feature of the economy à la Benabou and Ök (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 are a privileged, high income minority that has disproportionate access to resources and power whereas the poor are 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 control 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 prefer 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 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 Zayuela (1992) argue that, despite poor economic conditions of the 1980s, the people of Argentina strongly believed that they

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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.
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 a considerable poor population that could consolidate democracy. Das Gupta (1995: 308) 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'. 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 to break up the virtual yangban monopoly on higher education’ so as to provide expectations of social mobility for the lower class and delay democratization accordingly (Steinberg, 1995: 381). In Thailand, provision of an ‘important ladder for social mobility’ through military and bureaucracy to middle and lower class children accounts for the limited class conflict and stable semi-democracy (Chai-Anan, 1995: 358). 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 the 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 so 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 Acemog˘lu and Robinson (2001) by incorporating social mobility as a key feature of the economy’a la Benabou and Ök (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 constitute 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 \( \beta \).

Income of the country, \( w \), is drawn from the following distribution each period: \( w = w^L \) with probability \( \pi \), 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 \( \theta \). That is, when income is \( w^e \), \( e \in \{H, L\} \), per capita income of the poor is \( x_p^e = \left( \theta w^e / \lambda \right) \) and per capita income of the rich is \( x_r^e = (1 - \theta) w^e / (1 - \lambda) \).

I introduce social mobility into the model as a key feature of the economy adopting Behrman’s (2000: 74) 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.

Hence, relative social mobility, rather than showing total income change in a society, shows relative social status within a society. Pastore (1982: 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

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.
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 \( \tau \), and the transfers made by the government are \( T \), 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 Ök (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 \( C(\tau) = \alpha \tau \) where \( \alpha \in (0, 1) \) is constant.5 Following Benabou and Ök (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

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 do 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 \( (1 - \tau)x + (\tau - C(\tau))w^e \) is greater than \( \alpha[(1 - \tau_1)x + (\tau_1 - C(\tau_1))w^e] + (1 - \alpha)[(1 - \tau_2)x + (\tau_2 - C(\tau_2))w^e] \). 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.
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 hold the power and decide whether or not to enfranchise the poor. If the rich extend the franchise, then the regime switches to democracy and the poor set the tax rate for the next period. Otherwise, the rich choose a tax rate for the next period, and the poor decide whether to revolt or not. If the poor revolt, the rich of that period lose everything for ever, 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 do not extend the franchise and the poor do not revolt, then the tax rate that the rich set prevails, and the regime remains authoritarian (Figure 1). Revolution is costly. Let $\psi_{rev}$ ($\psi'_{rev}$) be the one-time per capita cost of a revolution during bad (good) times.

Under democracy, the poor (the majority) hold the power and set a tax rate for the next period. Then, the rich decide whether to attempt a coup or not. If the rich attempt a coup, the regime switches to autocracy and the rich determine the tax rate for the next period. Otherwise, the tax rate that the poor set prevails, and the regime remains democratic (Figure 2). Coup is costly. Let $\phi_{coup}$ ($\phi'_{coup}$) be the per capita cost of a coup during bad (good) times.\(^8\)

### 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

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8. I assume that a revolution or a coup changes the political state with probability 1. Ghate, Le and Zak (2003) argue that the taxation policy may change the effectiveness of social unrest. I abstract from such complications to better isolate the impact of social mobility on political transitions.
attempted, and a fraction $\kappa < 1$ of the poor (rich) take 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. 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) or $Rev$ (revolution). $\tau$ is the tax rate that will be applied in this period. $e$ is either $H$ or $L$ and its value is realized at the beginning of the current period. $R$ and $\tau$ 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 the franchise under autocracy, (ii) where to set the tax rate under autocracy in case the rich decide not to extend the 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 the franchise and the tax rate the rich set if the rich want to keep the autocracy. The poor’s strategy consists of two decisions: (i) whether to attempt a revolution under autocracy, and (ii) where to set the tax rate under democracy.

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 the 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).
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 these assumptions from Acemoglu and Robinson (2001). In good times, the cost of revolution ($\psi_{rev}$) and the cost of coup ($\phi_{coup}$) are so high that the poor prefer not to revolt under autocracy in good times, and the rich prefer 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 prefer higher redistribution rates (higher taxes) whereas the rich prefer lower redistribution rates (lower taxes), everything else being equal. This is in line with Ravallion and Lokshin’s (2001: 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. $\bar{w}_i = q_i \bar{x}_i + (1 - q_i)\bar{x}_i$. Then $\bar{Y}_i^d(\tau) = (1 - \tau)\bar{w}_i + (\tau - ct)\bar{w}$ is agent $i$’s one-period expected disposable income when the tax rate for that period is $\tau$. 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 $c < c_i = 1 - (\bar{w}_i/\bar{w})$, 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 $c \geq c_i$. 

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Then $c_r < c_p$ would guarantee that the range of $c$ for which the rich prefer 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 the franchise under autocracy. For the sake of simplicity, without introducing such additional cost, I will assume that the rich extend the 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 prefer the highest redistribution rate ($\tau_p = 1$), whereas the rich prefer 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 $\tau$. 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 $\chi(R, R') = (\phi_{\text{coup}}/\beta)$ if the transition from $R$ to $R'$ is due to a coup; $\chi(R, R') = (\psi_{\text{rev}}/\beta)$ 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

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

where

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

where $(R', \tau')$ is the next regime and the tax rate if it is a bad time, and $(R'', \tau'')$ is the next regime and the tax rate if it is a good time. Redistribution will occur according to $\tau$ 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 \( y^d_i(\tau) \). Agent \( i \) becomes a type \( j \) with probability \( q_j \). 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 \( \pi \). In this case, the regime and the tax rate will switch to \((R', \tau')\) on the transition path. Then agent \( i \)’s expected payoff at the very beginning of the next period is \( V_i(R', \tau') - \chi(R', R^\ast) \). It will be a good time with probability \( 1 - \pi \). In this case, the regime and the tax rate will switch to \((R'', \tau'')\) on the transition path. Then agent \( i \)’s expected payoff at the very beginning of the 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 \( y^d_i \) denote the current disposable income of agent \( i \) after realization of a low \( w \). i.e. \( y^d_i = (1 - \tau)x^d_i + \tau(1 - c)w^d_i \) where \( \tau \) is determined in the previous period. Note that \( y^d_i \) is not affected by any current decision of agents, since \( \tau \) is set in the previous period.

The characterization of the equilibrium is not a trivial extension of Acemoglu 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 they could become poor with a high probability next period. Or, the poor might prefer not to prevent a coup under democracy, thinking that they 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 it 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 it 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, \( \phi_{coup} \). Consider the following stationary transition pattern: under autocracy, the rich keep the regime authoritarian and set the tax rate at 0 during good times. The rich extend the franchise in a bad time, then the poor set the tax rate at 1. Under democracy, the poor set the tax rate at 1 during good times and at \( \tau \) during bad times. Democracy prevails forever.

Assuming that this transition pattern will prevail from the 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 \( y^d_{r'} - \phi_{coup} + \beta V_r(A, 0) \) where \( V_i(R', \tau') \) denotes the expected continuation utility of type \( i \) agent under the regime \( R' \) and tax rate \( \tau' \).
along this transition path. Note that if the rich attempt a coup during a bad time, the regime switches to autocracy. Furthermore, the rich bear the cost of coup, $\phi_{coup}$. 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 are indifferent between a coup and no coup, i.e. $\phi(\tau) = \beta[V_r(A, 0) - V_r(D, \tau)]$. Define the following: $\phi_l = \phi(0)$ and $\phi_h = \phi(1)$. Then, when $\phi_{coup} < \phi_l$, for any tax rate, the rich prefer 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 prefer 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):

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

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

Assuming that this transition pattern will prevail from the 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 $V_p(Rev, 0) = (w/\lambda(1 - \beta))$. Note that the poor bear the cost of revolution, $\psi_{rev}$. 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 $y_p^d + \beta V_p(A, \tau)$.

![Figure 3. Equilibrium and the Impact of Social Mobility](http://jtp.sagepub.com)
Let \( \psi_{rev} = \psi(\tau) \) be such that the poor are indifferent between revolting and not revolting, i.e. \( \psi(\tau) = \beta [ V_p(Rev, 0) - V_p(A, \tau) ] \). Define the following: \( \psi_0 = \psi(0) \) and \( \psi_1 = \psi(1) \). As opposed to \( \phi_l \) and \( \phi_h \), I 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 \( \psi_{rev} < \psi_1 \), for any tax rate, the poor prefer 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 prefer 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 set the tax rate at 0 during good times and at \( \hat{\tau} \) during bad times. Let \( \hat{\tau} \) be such that \( \beta V_p(A, \hat{\tau}) = -\psi_{rev} + \beta V_p(Rev, 0) \). That is, \( \hat{\tau} \) is the tax rate that just prevents a revolution along this transition pattern. The proof of the existence of \( \hat{\tau} \in [0, 1] \) 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 set the tax rate at 0 during a good time and extend the franchise during a bad time. Once the regime switches to democracy, it remains democratic, the poor set 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 do 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 do not attempt a coup.
   When \( c < c_p \):
2. If \( \psi_{rev} \geq \psi_h \), the regime stays authoritarian. The rich always set the tax rate at zero. The poor do not attempt a revolution.
3. If \( \psi_h > \psi_{rev} \geq \psi_l \), the regime stays authoritarian. The rich set the tax rate at zero during good times and at \( \hat{\tau} \) during bad times.
4. If \( \psi_{rev} < \psi_l \) and \( \phi_{coup} \geq \phi_h \), the rich set the tax rate at zero during good times under autocracy. They extend the franchise during the first bad time. The poor always set the tax rate at 1. The rich do not attempt a coup.
5. If $\psi_{rev} < \psi_l$ and $\phi_h > \phi_{coup} \geq \phi_l$, the rich set the tax rate at zero during good times under autocracy. They extend the franchise during the first bad time, then the poor set the tax rate at 1. Under democracy, the poor set the tax rate at 1 during good times. They set the tax rate at $\hat{\tau}_d$ during bad times. The rich do not attempt a coup.

6. If $\psi_{rev} < \psi_l$ and $\phi_l > \phi_{coup}$, the rich set the tax rate at zero during good times under autocracy. They extend the franchise during the first bad time, then the poor set the tax rate at 1. Under democracy, the poor set the tax rate at 1 during good times. The rich attempt a coup during bad times and set 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 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 the political elite manages the economy well. During bad times, the rich will increase taxes to avoid a revolution. And only when they anticipate that they will not be able to prevent a revolution by a temporary tax increase will the rich extend the 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 prefer 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 prevent 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 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 Acemoglu and Robinson (2001), who obtain a range of $\psi$ 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 is 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: \( (d\phi_l/dq_p) < 0 \).

As social mobility increases, the range of the cost of a 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), a 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: \( (d\phi_h/dq_p) < 0 \).

When \( \phi_{coup} > \phi_h \), i.e., if the cost of coup is sufficiently high, the rich never attempt 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: \( (dc_p/dq_p) < 0 \).

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 a poor social and economic situation in the 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 a considerable poor population that could consolidate democracy. Das Gupta (1995: 308) 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’. 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: \( (dy_1/dq_p) < 0 \).

When \( \psi_{rev} \geq \psi_I \), i.e. if the cost of revolution is sufficiently high, the rich keep autocracy, and the rich extend the franchise only when the cost of revolution is low, \( \psi_{rev} < \psi_I \). Thus, as social mobility increases, the region in which autocracy prevails expands. In other words, the poor that are ready to revolt \( (\psi_{rev} < \psi_I) \) may prefer not to revolt after an unanticipated increase in social mobility \( (\psi_{rev} > \psi_I \), where \( \psi_I \) is the new critical lower value for \( \psi_{rev} \) 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 to break up the virtual *yangban* monopoly on higher education so as to provide expectations of social mobility for the lower class and delay democratization accordingly (Steinberg, 1995: 381). In Thailand, provision of an ‘important ladder for social mobility’ through military and bureaucracy to middle and lower class children offers an explanation for low class conflict and stable semi-democracy (Chai-Anan, 1995: 358). 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 the 1980s and 1990s have largely eliminated the expectations of future welfare for lower class people. The Mexican data demonstrate that, 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 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

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.
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Appendix

A. Equilibrium Definition

Formally, let \( \sigma_r(S|\hat{\tau}_r) \) 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 extend the franchise, then franchise = 1, otherwise franchise = 0. franchise applies in states \((A, .., )\). If the rich attempt 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 set a tax rate when \((S = (A, .., ) \) and franchise = 0) or \((S = (D, .., ) \) and coup = 1).

Let \( \sigma_p(S|\text{franchise}, \hat{\tau}_r) \) denote the strategy of the poor. This is a function of the state of the world, \( S \), the rich’s decision on extending the 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 attempt 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 set 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 \((A, \tau_1, e)\) where \( \tau_1 \) is given at the beginning of period 1. Starting from \((A, \tau, e)\) 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 enfranchise the poor, then the state transits to \((D, \hat{\tau}_p, e)\). If the rich do not extend the franchise, and there is no revolution, then the state transits to \((A, \hat{\tau}_r, e)\). Starting from \((D, \tau, e)\), 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 \( \sigma_p \) and \( \sigma_r \).

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

\[
U_p(S) = \max_{\sigma_p} \{ Y^d_p(\sigma_p, \hat{\sigma}_r(S|\hat{\tau}_p), S) \\
+ \beta \int \left[ q_p U_p(S') + (1 - q_p) U_p(S') \right] dP(S'|\sigma_p, \hat{\sigma}_r(S|\hat{\tau}_p), S) \} \tag{1}
\]

and

\[
U_r(S) = \max_{\sigma_r} \left\{ Y^d_r(\sigma_r, \hat{\sigma}_p(S|\text{franchise}, \hat{\tau}_r), \sigma_r, S) \\
+ \beta \int \left[ q_r U_r(S') + (1 - q_r) U_r(S') \right] dP(S'|\hat{\sigma}_p(S|\text{franchise}, \hat{\tau}_r), \sigma_r, S) \right\} \tag{2}
\]
where $Y_i^t$ is the disposable income of an agent of type $i \in \{p, r\}$ as a function of $S$, $\sigma_p$ and $\sigma_r$. 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 $(\tilde{\sigma}_p(S|\text{franchise}, \tau), \tilde{\sigma}_r(S|\tilde{\tau}_p))$ 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 $Q = 1 - (q_p/1 - \lambda) = 1 - (q_r/\lambda)$ and $\tilde{w}_r - \tilde{w}_p = Q(\tilde{x}_r - \tilde{x}_p)$.

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

**Proof:** $c_r < c_p \iff \tilde{w}_p < \tilde{w}_r \iff 0 < \tilde{w}_r - \tilde{w}_p = Q(\tilde{x}_r - \tilde{x}_p) \iff 0 < Q$. The last inequality follows from the fact that $\tilde{x}_r > \tilde{x}_p$. 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 $(d/dq_r)(q_r Q/(1 - \beta Q))$ is $1/(1 - \beta)$ when $q_r = 0$ and its minimum is $-1$ when $q_r = \lambda$. The maximum of $(d/dq_p)(q_p Q/(1 - \beta Q))$ is $1/(1 - \beta)$ when $q_p = 0$ and its minimum is $-1$ when $q_p = \lambda$.

**Proof:** To see this result, compute the following: $(d^2/dq_r^2)(q_r Q/(1 - \beta Q)) = -2/\lambda (1 - \beta Q)^2 - 2\beta/\lambda(1 - \beta Q) < 0$. So, the maximum of $(d/dq_r)(q_r Q/(1 - \beta Q)) = Q/(1 - \beta Q) - q_r/\lambda(1 - \beta Q)^2$ is $1/(1 - \beta)$ 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 $(d/dq_p)(q_p Q/(1 - \beta Q)) = (d/dq_r)(q_r Q/(1 - \beta Q))$. This completes the proof.

**Stationary Transition Patterns**

**Stable Autocracy, $A(\tau)$:** The regime remains autocratic. The rich set 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:

\[
V_i(A, 0) = \tilde{w}_i + \beta[q_i W_j(A) + (1 - q_i) W_i(A)],
\]

\[
V_i(A, \tau) = V_i(A, 0) - \tilde{w}_i + \tilde{Y}_i(\tau) = V_i(A, 0) - \tau(\tilde{w}_i - (1 - c)\tilde{w}),
\]

\[
W_j(A) = \pi V_j(A, \tau) + (1 - \pi)V_i(A, 0) = V_i(A, 0) - \pi \tau(\tilde{w}_i - (1 - c)\tilde{w}).
\]
The value functions along this transition path can be calculated as follows:

\[ V_r(A, 0) = \frac{1}{1 - \beta} \left\{ \tilde{w}_r - \beta \pi \tilde{w}_r (1 - c) \tilde{w} - \frac{\beta q_r (1 - \pi)}{1 - \beta Q} (\tilde{w}_r - \tilde{w}_p) \right\} \]

\[ V_p(A, 0) = \frac{1}{1 - \beta} \left\{ \tilde{w}_p - \beta \pi \tilde{w}_p (1 - c) \tilde{w} + \frac{\beta q_p (1 - \pi)}{1 - \beta Q} (\tilde{w}_r - \tilde{w}_p) \right\} \]

and

\[ V_p(A, \tau) = \frac{1}{1 - \beta} \left\{ \tilde{w}_p - \tau (1 - \beta (1 - \pi)) (\tilde{w}_p - (1 - c) \tilde{w}) + \frac{\beta q_p (1 - \pi)}{1 - \beta Q} (\tilde{w}_r - \tilde{w}_p) \right\} \]

**Stable Democracy, D(\tau):** In autocracy, the rich set the tax rate at 0 in a good time and extend the franchise in a bad time, then the poor sets the tax rate at 1. In democracy, the poor set 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:

\[ V_i(A, 0) = \tilde{w}_i + \beta [q_i W_j(A) + (1 - q_i) W_i(A)] \]

\[ W_i(A) = \pi V_i(D, 1) + (1 - \pi) V_i(A, 0) \]

\[ V_i(D, 1) = (1 - c) \tilde{w} + \beta [q_i W_j(D) + (1 - q_i) W_i(D)] \]

\[ V_i(D, \tau) = \tilde{Y}_i^d(\tau) + \beta [q_i W_j(D) + (1 - q_i) W_i(D)] = V_i(D, 1) + \tilde{Y}_i^d(\tau) - (1 - c) \tilde{w} \]

\[ W_i(D) = \pi V_i(D, \tau) + (1 - \pi) V_i(D, 1) = V_i(D, 1) + \pi [\tilde{Y}_i^d(\tau) - (1 - c) \tilde{w}] \]

I will use the following later:

\[ V_r(A, 0) = \frac{1}{1 - \beta (1 - \pi)} \left\{ \tilde{w}_r + \beta \pi V_r(D, 1) \right. \]

\[ - \frac{q_r}{1 - \beta Q (1 - \pi)} ((1 - \pi) (\tilde{w}_r - \tilde{w}_p) + \pi [V_r(D, 1) - V_p(D, 1)]) \left\} \right. \]

\[ V_r(D, 1) = \frac{1}{1 - \beta} \left\{ (1 - c) \tilde{w} + \beta \pi (1 - \tau) ((\tilde{w}_r - (1 - c) \tilde{w}) \right. \]

\[ - \frac{q_r}{1 - \beta Q (\tilde{w}_r - \tilde{w}_p)} \left. \right\} \]

**Unstable Regime, AD:** In autocracy, the rich set \( \tau = 0 \) in a good time and extend the franchise in a bad time, then the poor set \( \tau = 1 \). In democracy, the poor set \( \tau = 1 \) in a good time. In a bad time under democracy, the rich attempt a coup, and the regime switches to autocracy, then the rich set \( \tau = 0 \). The payoffs on the equilibrium path can be calculated as:
Compute the following so that result immediately implies that 

Next, to show result (ii), use

Note that I use the derivatives with respect to 

Then

This completes the proof of (iii). First note that

Next, where 

So the maximum of is attained when 

Then

Note that I use the derivatives with respect to to just prove these results for all values of . I will keep constant in equilibrium. Then I will compare different equilibria for different values of .
Lemma 4: Along the transition path $A(\tau)$, $(dV_r(A, 0)/d\tau) < 0$ and $(dV_r(A, \tau)/d\tau) < 0$.

Proof: Note that

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

Then $(dV_r(A, 0)/d\tau) = [\beta \pi/(1 - \beta)][-(\bar{w}_r - (1 - c)\bar{w}) + q_r Q(\bar{x}_r - \bar{x}_p)/(1 - \beta Q)]$. Note that $(dV_r(A, 0)/d\tau) < 0$ when $q_r = 0$ and $q_r = \lambda$. To show that $(dV_r(A, 0)/d\tau) < 0$ all the time, I will show that $(d/dq_r)((dV_r(A, 0)/d\tau)) \geq 0$ so that $(dV_r(A, 0)/d\tau)$ is monotone in $q_r$. Then $(dV_r(A, 0)/d\tau) < 0$ follows: $(d/dq_r)((dV_r(A, 0)/d\tau)) = [\beta \pi(\bar{x}_r - \bar{x}_p)/(1 - \beta)]\{1 + [q_r Q/(1 - \beta Q)]\}$. From Result 1, the minimum of $[q_r Q/(1 - \beta Q)]$ is $-1$ when $q_r = \lambda$. Substituting its minimum value above, one obtains $(d/dq_r)((dV_r(A, 0)/d\tau)) \geq 0$. Noting that $(d\bar{Y}_d(\tau)/d\tau) < 0$, this result implies that $(dV_r(A, \tau)/d\tau) < 0$. 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 choose between setting the tax rate at $\tau_r = 0$ and extending the franchise. The next proposition states that the rich always prefer the former to the latter.

Proposition 7: In good times, the rich prefer to keep the autocracy and set 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 contrast, suppose that the rich prefer to extend the franchise in good times. Then, they do so in bad times as well. Because: (i) this preference ordering over future distribution is independent of the current state of the economy; (ii) if the poor revolt even when the tax rate is set to $\tau_r$, then extending the franchise in bad times prevents a revolution. If the rich prefer to extend the franchise in good times, then the rich never attempt a costly coup under democracy. So, once the rich extend 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 $(1 - c)\bar{w}/(1 - \beta)$. 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 my 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 $q_r \bar{x}_p + (1 - q_r)\bar{x}_r + \beta(1 - c)\bar{w}/(1 - \beta)$. By my supposition, the rich prefer extending the franchise, i.e. $(1 - c)\bar{w}/(1 - \beta) \geq q_r \bar{x}_p + (1 - q_r)\bar{x}_r + \beta(1 - c)\bar{w}/(1 - \beta)$, which is equivalent to $q_r \geq (\bar{x}_r - (1 - c)\bar{w})/(\bar{x}_r - \bar{x}_p)$. Substituting $q_r = \lambda q_p/(1 - \lambda)$, $\bar{x}_p = \theta \bar{w}/\lambda$, and $\bar{x}_r = (1 - \theta)\bar{w}/(1 - \lambda)$, I obtain $q_p \geq (1 - \lambda)(1 + c(1 - \lambda)/(\lambda - \theta)) > 1 - \lambda$. The last inequality follows from $\lambda > \theta$. This contradicts 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 set 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 $\tau_r = 1$ under democracy may trigger a coup. In order to avoid a coup, the poor may lower the tax rate. In this case, the poor face two options: (i) set a high tax rate and trigger a coup; (ii) lower the tax rate and prevent a coup. Because of social mobility, it is not obvious which option the poor prefer. The next proposition states that there does not exist any equilibrium in which the poor prefer to trigger a coup even though they can prevent it.

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

**Proof:** In contrast, suppose that there exists an equilibrium in which (i) the regime switches to democracy, (ii) there exists a tax rate that prevents a coup in a bad time during democracy; (iii) the poor prefer to trigger a coup. Then the transition pattern $A D$ 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 $\tau_d$ if it is a bad time today. Compute the value of this action: $V_i(D, \tau_d) = \bar{Y}_i^{d}(\tau_d) + \beta[q_iW_f(D) + (1 - q_i)W_i(D)] = \bar{Y}_i^{d}(\tau_d) - (1 - c)\bar{w} + V_i(D, 1)$. Note that $\tau_d$ prevents a coup, i.e. $y_d^{i} + \beta V_i(D, \tau_d) \geq y_d^{i} - \phi_{coup} + \beta V_r(A, 0)$ that is

$$\frac{\phi_{coup}}{\beta} \geq V_i(A, 0) - V_i(D, 1) - [\bar{Y}_i^{d}(\tau_d) - (1 - c)\bar{w}]. \quad (1)$$

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

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

I will arrive at a contradiction by showing that the right hand side of (1) is greater than the left hand side of (2), i.e. equivalently $V_i^{AD} - V_i^{PD} > \bar{Y}_i^{d}(\tau_d) - \bar{Y}_i^{d}(\tau_d) = (1 - \tau_d)(\bar{w}_r - \bar{w}_p)$ where $V_i^{AD} = V_i(A, 0) - V_i(D, 1)$.

This implies that $V_i^{AD} - V_i^{PD} \geq \bar{w}_r - \bar{w}_p > (1 - \tau_d)(\bar{w}_r - \bar{w}_p)$, which is the required contradiction. This completes the proof.

Therefore, in any equilibrium, the poor prevent a coup as long as they can.

In bad times under autocracy, setting the tax rate at $\tau_r = 0$ may trigger a revolution. Since the rich lose everything in a revolution, they always want 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 prefer. The next proposition states that there does not exist any equilibrium in which the rich prefer 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; yet (ii) the rich prefer to extend the franchise.

Proof: In contrast, suppose that there exists an equilibrium in which (i) there exists a tax rate \( \hat{r} > 0 \) that just prevents a revolution in a bad time under autocracy; yet (ii) the rich prefer to extend the franchise.

In such an equilibrium, there are two possibilities: (1) in future, a coup occurs during bad times under democracy; or (2) no coup occurs in future. I will arrive at 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 set \( r = 0 \) in a good time and extend the franchise in a bad time, then the poor set \( r = 1 \).

In a democracy, the poor set \( r = 1 \) in a good time; the rich attempt a coup in a bad time under democracy, then the regime switches to autocracy and the rich set \( r = 0 \). Equilibrium behavior implies that \( (\text{payoff of extending the franchise}) > (\text{payoff of not extending the franchise}) \), equivalently

\[ V_r(D, 1) > V_r(A, \hat{r}). \] (3)

Furthermore, Proposition 8 implies that the poor try to prevent a coup in an equilibrium as long as they can. So, in this equilibrium, even setting \( r = 0 \) cannot prevent a coup in a bad time. That is

\[ \gamma_r^d - \phi_{\text{coup}} + \beta V_r(A, 0) > \gamma_r^d + \beta V_r(D, 0). \] (4)

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

\[ V_{r, AD} - [\hat{w}_r - (1 - c)\hat{w}] > \frac{\phi_{\text{coup}}}{\beta} \geq 0 \] (5)

Compute the rich’s payoff from the alternative action of setting the tax rate at \( \hat{r} \) and preventing a revolution today: \( V_r(A, \hat{r}) = Y_r^{d/}(\hat{r}, \hat{w}_r) - \hat{w}_r + V_r(A, 0) \). Then

\[ V_r(A, \hat{r}) - V_r(D, 1) = V_{r, AD} + \left[ Y_r^{d/}(\hat{r}, \hat{w}_r) - \hat{w}_r \right] = V_{r, AD} - \hat{r} [\hat{w}_r - (1 - c)\hat{w}] > 0 \] where \( V_{r, AD} = V_r(A, 0) - V_r(D, 0) \). The last inequality follows from (5). This contradicts my supposition (3). So, the rich always prefer to keep the autocracy in case 1.

Case 2: Suppose that there exists a tax rate \( \hat{r}_d \) that prevents a revolution during a bad time under autocracy. Also suppose in contrast that the rich prefer to extend the franchise. Then the following stationary transition pattern \( D(\hat{r}_d) \) is observed along the equilibrium path: under autocracy, the rich set \( r = 0 \) during good times, and extend the franchise during the first bad time. Then the poor set \( r = 1 \). The regime never switches back to autocracy. The poor set the tax rate at 1 during good times and at \( \hat{r}_d \) during bad times.
By substituting \(q_r\) we denote the derivative with respect to \(q_r\). Then

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

Proof: Consider the stationary transition pattern \(D(\tau)\). Define the following:

\[
\alpha(\tau) = V_r(A, 0) - V_r(D, \tau) = V_r(A, 0) - V_r(D, 1) - (\tilde{Y}^l_\tau - (1-c)\tilde{w}).
\]

That is,

\[
\alpha(\tau) = \frac{1}{1 - \beta(1 - \pi)} \left\{ \tilde{w}_r - (1 - \beta) V_r(D, 1) - \frac{q_r}{1 - \beta Q(1 - \pi)} ((1 - \pi)(\tilde{w}_r - \tilde{w}) + \pi[V_r(D, 1) - V_r(D, 1)]) \right\} 
- (\tilde{Y}^d_\tau - (1-c)\tilde{w}).
\]

Then

\[
\frac{d\alpha}{d\tau} = -\frac{1}{1 - \beta(1 - \pi)} \left\{ (1 - \beta) \frac{dV_r(D, 1)}{d\tau} + \frac{\pi q_r}{1 - \beta Q(1 - \pi)} \frac{d}{d\tau} (V_r(D, 1) - V_r(D, 1)) \right\} 
- \frac{d\tilde{Y}^d_\tau}{d\tau}.
\]
Proposition 10: stable autocracy, (i) The existence of unique such that this equilibrium will be time and extend the franchise in a bad time. Once the regime switches to democracy, it then exists a unique under A(τ), I can easily compute the following:

\[ \psi_0 - \psi_1 = \frac{\beta}{1 - \beta} \left( (1 - \beta(1 - \pi))(1 - \nu)\tilde{w} - \tilde{w}_p - \frac{\beta \pi q_p}{1 - \beta(1 - \pi)}(\tilde{w}_r - \tilde{w}_p) \right). \]

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

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

Proposition 11: Assume that \( \phi_h > \phi_{\text{coup}} \geq \phi_l \). For any \( \tilde{\tau} \in [0, 1] \), consider the following transition pattern \( A(\tilde{\tau}) \): the regime remains authoritarian, the rich set the tax rate at 0 during good times and at \( \tilde{\tau} \), during bad times. Then there exists a unique \( \tilde{\tau} \in [0, 1] \) such that \( \nu V_p(A, \tilde{\tau}) = -\psi_{\text{rev}} + \nu V_p(Rev, 0) \) along \( A(\tilde{\tau}) \).

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

To see (i), note that along \( A(\tau) \), \( (dV_p(A, \tau)/d\tau) = (\beta/(1 - \beta))\{1 - \beta(1 - \pi)\}(1 - \nu)\tilde{w} - \beta\pi q_p(\tilde{w}_r - \tilde{w}_p)/(1 - \betaQ) = \psi_0 - \psi_1 \). Furthermore, \( \psi_0 - \psi_1 > 0 \) since \( \psi_h > \psi_l \), (ii) and (iii) follow from \( \psi_h > \psi_{\text{rev}} \geq \psi_l \) and the definitions of \( \psi_h \) and \( \psi_l \). This completes the proof.

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

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 \( A(\tau) \). Using the value function \( V_p(A, \tau) \) under \( A(\tau) \), I can easily compute the following:

\[ \psi_0 - \psi_1 = \frac{\beta}{1 - \beta} \left( (1 - \beta(1 - \pi))(1 - \nu)\tilde{w} - \tilde{w}_p - \frac{\beta \pi q_p}{1 - \beta(1 - \pi)}(\tilde{w}_r - \tilde{w}_p) \right). \]

When \( q_p = 0 \), \( \psi_0 - \psi_1 > 0 \) since \( (1 - \nu)\tilde{w} > \tilde{w}_p \). Let \( q_p \) be such that \( (1 - \nu)\tilde{w} = \tilde{w}_p \). Then \( \psi_0 - \psi_1 < 0 \). Furthermore, \( (d(\psi_0 - \psi_1)/dq_p) = -[\beta(\tilde{x}_r - \tilde{x}_p)/(1 - \beta)]\{1 - \beta(1 - \pi) + \beta\pi[q_pQ/(1 - \betaQ)]\} \) where \([\cdot]' \) denotes the derivative with respect to \( q_p \). Using Lemma 2, substitute \( \{q_pQ/(1 - \betaQ)\}' \) with \(-1 \), then \( (d(\psi_0 - \psi_1)/dq_p) < \) \(-([\tilde{x}_r - \tilde{x}_p])/(1 - \beta))[1 - \beta(1 - \pi) - \beta\pi] = -(\tilde{x}_r - \tilde{x}_p) < 0 \). This completes the proof.
Using these values, note that \( V_r > 0 \). So, \((d/d\tilde{\tau}_d)(V_r(A, 0) - V_r(D, \tilde{\tau}_d)) > 0 \) for all \( q_r \). Now, remember that 

\[
(\phi_{coup}/\beta) = V_r(A, 0) - V_r(D, \tilde{\tau}_d).
\]

By definition of \( \phi_\tau \), \( \tilde{\tau}_d = 0 \) when \( \phi_{coup} = \phi_\tau \) and \( \tilde{\tau}_d = 1 \) when \( \phi_{coup} = \phi_h \). Since \((d/d\tilde{\tau}_d)(V_r(A, 0) - V_r(D, \tilde{\tau}_d)) > 0 \), there exists a unique \( \tilde{\tau}_d \in [0, 1] \) that satisfies \( (1) \) when \( \phi_h > \phi_{coup} \geq \phi_\tau \).

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

**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 extend the franchise and the poor set the tax rate at zero on the equilibrium path.

2. When \( \psi_{rev} \geq \psi_h \), the poor do not revolt if the rich set the tax rate at zero all the time. Then the proof that the rich prefer 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 \( \tilde{\tau}_r \in [0, 1] \) such that 

\[
\beta V_r(A, \tilde{\tau}_r) = -\psi_{rev} + \beta V_r(Rev, 0) \text{ along } A(\tilde{\tau}_r).
\]

In order \( A(\tilde{\tau}_r) \) to be an equilibrium path, I need to show that the rich prefer to set the tax rate at \( \tilde{\tau}_r \) rather than extend the franchise in a bad time under autocracy given that the rich of the future will prefer autocracy to democracy (or in other words, given that the regime will remain autocratic in future if today’s rich do not extend the franchise). First consider the following case: if the rich extend the franchise than the regime remains democratic in the equilibrium of the subgame. Then the poor optimally set the tax rate at 1 in good times and at \( \tilde{\tau}_d \) in bad times, \( \tilde{\tau}_d \) as given as in Proposition 11.

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

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

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

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

Using these values, note that \( V_r(A, 1) - V_r(D, 1) = \beta(1 - 2\pi)\Gamma(q_r)/(1 - \beta) \) where \( \Gamma(q_r) = (\bar{w}_r - (1 - c)\bar{w}) - q_r(\bar{w}_r - \bar{w}_p)/(1 - \beta Q) \). Then \( \Gamma(q_r) > 0 \) implies \( V_r(A, 1) > V_r(D, 1) \). To see that \( \Gamma(q_r) > 0 \), compute the following: \( d\Gamma/dq_r = - (\bar{x}_r - \bar{x}_p)(1 + [q_r Q/(1 - \beta Q)]) \) where \([\ ]' \) denotes the derivative with respect to \( q_r \).

From Lemma 2, the minimum of \([q_r Q/(1 - \beta Q)]' \) is \(-1\) when \( q_r = \lambda \). Then the maximum of \((d\Gamma/dq_r) \) is equal to zero when \( q_r = \lambda \) so that \((d\Gamma/dq_r) < 0 \) for all \( q_r < \lambda \). Then
the minimum of $\Gamma$ is attained when $q_r = \lambda$. This value is equal to $cw > 0$. 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 prefer the autocracy with the worst payoff for them to the democracy with the best payoff for them. Then I can generalize this for any $\hat{\xi}_r$ and $\hat{\xi}_d$ by applying Lemmas 3 and 4.

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

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

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

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

(1) is guaranteed by Proposition 11. In contrast, suppose that (2) is not satisfied along this stationary transition path, i.e. $(\phi_{coup}/\beta) < V_p(A, 0) - V_p(D, \hat{\xi}_d)$. Equivalently, $V_r(A, 0) - V_r(D, \hat{\xi}_d) < V_p(A, 0) - V_p(D, \hat{\xi}_d)$

Now, this will yield a contradiction. Rewrite the above inequality: $V_r(A, 0) - V_r(D, \hat{\xi}_d) < V_p(A, 0) - V_p(D, \hat{\xi}_d) \iff \hat{\xi}_d(\hat{w}_r - \hat{w}_p) < \beta Q(W_{rAD} - W_{pAD})$ where $W_{rDA} \equiv W_r(D) - W_r(A)$.

On the left hand side, I have $\hat{\xi}_d(\hat{w}_r - \hat{w}_p) \geq 0$. However, on the right hand side, $W_{rDA} - W_{pDA} = -[(1 - \pi) - \pi(1 - \hat{\xi}_d)](\hat{w}_r - \hat{w}_p)/(1 - \beta Q(1 - \pi)) < 0$. The last inequality follows from $\pi < 0.5$ and $\hat{w}_r > \hat{w}_p$. This gives the required contradiction. In turn, this proves that given that the poor of the future will prevent a coup, today’s poor will prevent a coup by setting the tax rate at $\hat{\xi}_d$ 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 extend the franchise in a bad time under autocracy. They optimally set the tax rate at zero in a good time under autocracy. Since $\phi_{coup} < \phi_t$, there does not exist a tax rate that prevents a coup. The rich attempt a coup in a bad time under democracy,
then set the tax rate at zero. The poor optimally set the tax rate at one in a good time under democracy. This completes the proof.

**Proposition 3:** \( (d \phi_t/d q_p) < 0. \)

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

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

where \( \Omega = (1 - 2\pi)(1 - \beta Q(1 - \pi) - q_p)\bar{w} + q_p\bar{\omega}_p)/(1 - \beta Q(1 - \pi)). \) To simplify the calculations later, let \( \Pi = \Omega(1 - 2\pi), \xi = 1 - \beta Q(1 - \pi) \) and \( \gamma = [1 - \beta Q(1 - \pi) - q_p]\bar{w} + q_p\bar{\omega}_p, \) then \( \Pi = (\gamma/\xi) = (1/\xi)[\xi - q_p]\bar{w} + q_p\bar{\omega}_p. \) Let \( \Pi', \xi' \) and \( \Omega' \) denote the derivatives with respect to \( q_p. \) Using \( \gamma = \xi \Pi, \) I have \( \gamma' = \xi' \Pi + \xi \Pi', \) that is \( \Pi' = (\gamma'/\xi')/\xi. \) Since \( \xi > 0 \) and \( \pi < 0.5, \) I have \( \text{sign}(\phi_t) = \text{sign}(\Omega') = \text{sign}(\gamma'/\xi'). \)

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

**Proposition 4:** \( (d \phi_h/d q_p) < 0. \)

**Proof:** First, when \( \phi_{\text{coup}} = \phi_h, \) once the regime switches to democracy, it remains democratic and the poor always set \( \tau = 1. \) 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 \( (1 - c)\bar{w}/(1 - \beta). \) That is, \( V_r(D, 1) = (1 - c)\bar{w}/(1 - \beta) \) for \( i \in \{p, r\}. \) Also \( \phi_h = \beta[V_r(A, 0) - V_r(D, 1)] \) where \( V_r(A, 0) \) is calculated along \( D(1). \) So, \( (d\phi_h/dq_p) = \beta(dV_r(A, 0)/dq_p). \) Using the equation system for \( D(1), \) one can solve for \( V_r(A, 0): \)

\[
V_r(A, 0) = \frac{1}{1 - \beta(1 - \pi)} \left\{ \bar{x}_r + \beta \pi (1 - c)\bar{w} - \frac{q_p}{1 - \beta Q(1 - \pi)(\bar{x}_r - \bar{x}_p)} \right\}
\]

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

**Proposition 5:** \( (dc_p/dq_p) < 0. \)

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

**Proposition 6:** \( (d\psi_1/dq_p) < 0. \)

**Proof:** In order to prove this result, I will show that both \( \psi_0 \) and \( \psi_1 \) are decreasing functions of \( q_p. \) The value function \( V_r(A, \tau) \) under a stable autocracy \( A(\tau) \) has been
calculated before. I set \( \tau = 0 \) in \( V_p(A, \tau) \) to calculate \( \psi_0 \), and \( \tau = 1 \) in \( V_p(A, \tau) \) to calculate \( \psi_1 \). Note that \( (dV_p(A, \tau)/dq_p) = [(\tilde{x}_r - \tilde{x}_p)/(1 - \beta)][1 - \tau(1 - \beta(1 - \pi)) + [\beta q_p(1 - \tau))/(1 - \beta Q)]' \). Also, \( \text{sign}(dV_p(A, \tau)/d\tau) = -\text{sign}(dV_p(A, \tau)/dq_p) \) for \( \tau \in \{0, 1\} \). For \( \psi_0 \), note that \( (dV_p(A, 0)/dq_p) = [(\tilde{x}_r - \tilde{x}_p)/(1 - \beta)][1 + \beta q_p Q/(1 - \beta Q)]' > 0 \). For \( \psi_1 \), note that \( (dV_p(A, 1)/dq_p) = [(\tilde{x}_r - \tilde{x}_p)/(1 - \beta)]\beta(1 - \pi)[1 + q_p Q/(1 - \beta Q)]' > 0 \). The inequalities follow from the fact that the minimum value of \( q_p Q/(1 - \beta Q) \)' is \(-1\) (Lemma 2). This completes the proof.

BAHAR LEVENTOĞLU received her PhD in Political Science from the University of Rochester in 2001, and is currently an Assistant Professor of Political Science at Stony Brook University. She is engaged in research on formal models of democratization (protection of minorities under different political systems, impact of ethnic tensions on the process of democratization) and of international relations (public commitment in international bargaining, and rational theories of war). ADDRESS: Department of Political Science, Stony Brook University, Stony Brook, NY 11794, USA [email: bahar.levantoglu@stonybrook.edu].