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The Golden Halo and Political Transitions

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Abstract

In this paper we analyze the role of the IMF and the World Bank in triggering changes in the political regime, i.e., democracy and autocracy. We develop a theoretical model which predicts that anticipation of financial flows from international financial institutions may trigger political regime changes which would not take place otherwise. We test the implications of our model empirically and find support both for the role of perfectly foreseen IMF and World Bank programs and of the history of previous World Bank programs. The magnitude of this effects is quite substantial.

Keywords: political transitions; democracy; autocracy; political instability;

1 Introduction

The emergence of a new political regime is often followed by loan agreements with international organizations such us the World Bank and the IMF. This is true for both new democracies and new autocracies. For example, IMF agreements with newly established political regimes range from Bolivia in 1956 to Jordan in 1990, include emerging democracies as Spain in 1978 or Turkey in 1979, as well as emerging dictatorships like Chile in 1974 or Argentina in 1976, and involve a considerable amount of money. We refer to these capital inflows to either new democracies or new autocracies as "golden halos" and investigate their effect on political stability.

This unexplored question comes with the perk of allowing for an empirical test of Acemoglu and Robinson's theory of political transitions. In a series of papers and a subsequent book, Acemoglu and Robinson refreshed the analysis of the determinants of autocracy and democracy. This work attracted a plethora of favorable reviews and became the main reference in the field. Criticisms focus on the empirical implementation and relevance of some of the pieces of their argument. Of particular importance is that the type of political regime emerging in equilibrium depends of how costly is for the economic elite to mount a coup and for the citizens to organize a revolution. Obviously, these variables are difficult to quantify.

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We propose a new test of their framework. We extend their theory of political transitions by incorporating the possibility of "golden halos". More specifically, we assume that a newly established political regime after a transition to either democracy (after a process of democratization) or autocracy (after a coup) *may* receive a transfer from abroad. This feature implies the following prediction: the expectation of golden halos increases the probability of a political regime change; that is, it causes regime instability. This is an important prediction as one the intentions behind IMF and World Bank agreements with new regimes is to achieve political stability. Moreover, golden halos may induce democratization if available exclusively to emerging democracies.

Through which transmission channel do golden halos affect the stability of newly established political regimes? Following Acemoglu and Robinson, we assume that democratic majority (the poor) imposes tougher taxation than autocracies representing the interests of the economic elite (the rich). Under autocracy, the poor can only induce redistribution through the threat of revolution. If binding enough, the elite will offer concessions but these are as temporary as the revolution threat. When temporary redistribution is not enough, democratization appears as the only credible action against the prospects of a revolution. Under democracy, the threat of a coup can temper redistribution pressure. Again, if temporary democratic concessions are not enough, a coup can restore rich citizens' hegemony through the (re-)emergence of an autocratic regime. Both revolution and coup threats depend on the resources destroyed in the process of revolution or autocracy restoration. Transfers to new regimes influence the elite's incentives associated with extending voting rights (democracy is more beneficial) and mounting a coup (lower costs). If large enough, anticipations of a golden halo can trigger a regime switch that would not otherwise have taken place. If neutral with respect to whether the new regime is a democracy or an autocracy, golden halos imply regime instability. If biased in favor of a particular political regime, expected golden halos can either reduce or spread democratization around the world.

The impact of golden halos is therefore of empirical nature. Thus, we estimate the probability of a regime transition across the world between 1970 and 2002 and test the effect of diverse definitions of golden halos. These measures differ in two dimensions, the source of golden halos and how political agents predict their possibility. As to the source, we restrict our attention to different level of agreements with the World Bank and the IMF. This is important as they involve significant resources made available to both new democracies and new dictatorships. As to predictability, we consider specifications with either rational or adaptive expectations. We approximate rational expectations by an indication of whether a golden halo was received by the

country after a transition. That is, the effect of a fully anticipated golden halo. In the adaptive expectations version, we build an indicator that weights the country's past record of golden halos with the experience of the country's neighbors. This allows for different levels of information considered by political agents in the prediction of a golden halo. In a narrow specification, only national experience counts. This is not only conceptually restrictive but also generates potential bias in our estimations as golden halos can be correlated with unobserved factors triggering regime transitions. We therefore use broader definitions that include the experience of neighbor countries. Arguably, neighbor effects can be considered to be exogenous from the point of view of the country and therefore they reduce the risk of endogeneity in estimating the effect of a golden halo.

Our analysis is related to multiple strands of the literature and several open questions. There is a literature on the origins and dynamics of different political regimes and institutions in addition to AR's work (Boix, 2003; Gradestein, 2007; Lizzeri and Perico, 2004). This literature has mainly focused on domestic factors such as inequality, growth volatility and economic development. Far less emphasis has been placed on the role played by the international community. Exception are Acemoglu and Robinson (2005, chapter 10) and Boix (2003). While AR focus on the effects of international trade, Boix argues that capital mobility reduces redistribution under democracies which in turns facilitates democratization. In a previous paper, we analyze the effect of foreign countries in sponsoring coups, stabilizing dictatorships and facilitating constrained democratization (AA 2009). Easterly, Satyanath and Berger (2008) provide evidence of US and Soviet interventions and quantify their impact as a decline in democracy across the world of about 33%.

The literature on the empirical determinants of democracy and autocracy is large and offer a great variety of potential determinants. Gassebner, Lamla and Vreeland (2009) find that, of among 59 factors, past transitions are the most robust determinant of the establishment and consolidation of democracy. Even more notably, GDP per capita only influences the survival probability o democracies but not its emergence. To our knowledge, no previous study has investigated theoretically or empirically the effects of transfers to new political regimes. We therefore offer a novel determinant that complements previous analysis.

The effects of the IMF and to a lesser extent of the World Bank have also attracted a lot of work. Vreeland (2003) who finds that IMF agreements reduce economic growth and increase inequality. More recently, Barro and Lee (2005) also find a negative effect on economic growth, but add that IMF loans increase trade openness and reduce both the rule of law and democracy.

The antidemocratic effect of the IMF goes in favor of our argument although we focus on a well defined time window of the agreement.

In particular relevant for our paper is the literature dealing with the political effects of the IMF and the World Bank. Smith and Vreeland (2003) show that IMF programs affect the survival rates of political leaders while Killick (1995) as well as Dreher (2004) document that re-election probabilities are affected by IMF programs. One possible channel for political effects of the International Financial Institutions (IFI) is documented by Vreeland (1999) how identifies the scape goat function of IFIs: Unpopular policies can be blamed on conditionality if under and IMF program, for instance. Moreover, Dreher and Vaubel (2004) document that money obtained from IFIs is sometimes abused by governments to secure power.

Moreover, Dreher and Gassebner (2008) show that remaining under an IMF or World Bank program without an economic crises (such as high inflation or low levels of foreign reserves) increase the likelihood of a political crises. If Golden Halo transfers are granted without economic necessity this would furthermore pinpoint to an increase of political instability due to the involvement of IMF and World Bank.

2 The Model

In this section, we outline and extend the theory of political transition proposed by Acemoglu and Robinson (2001). We have simplified the theory in several dimensions. These simplifications facilitate the exposition but are not critical for the point we want to make. We consider a society with infinite time horizon, $t = 0, 1, ...\infty$. Incomes are discounted by the factor β. It is populated by two groups of individuals, the rich and poor. The total size of the population is normalized to 1 and the fraction of poor is $\lambda > \frac{1}{2}$. The political regime (S_t^{Pol}) of the society can be either democracy ($\mathcal{D}$), autocracy ($\mathcal{A}$) or socialism ($\mathcal{S}$), i.e., the *political state* is $S_t^{Pol} \in \{\mathcal{D}, \mathcal{A}, \mathcal{S}\}$. Regime transitions happen through coups, revolutions, or democratization. The opportunities for coups and revolutions depend on many different political, technological and economic factors. To capture this, we assume that the costs of coups and revolutions are stochastic and depend on the *social state* ($S_t^s \in \{G, B\}$). When the social state is G, conditions for either a coup or a revolution are favorable and the costs are relatively low (see below). When the social state is B, a coup or a revolution is prohibitively costly. The probability that the social state is G (B) is denoted ψ

$(1-\psi)$.[1]

We specify the per-period incomes of the members of the two groups directly as functions of the political states and denote them by $y_i\left(S_t^{Pol}\right)$ for $i \in \{R, P\}$.[2] Utility is linear in incomes. Under autocracy, the rich control the government and no redistribution takes place. The income of the rich is $y_R(\mathcal{A})$ while that of poor is $y_P(\mathcal{A}) < y_R(\mathcal{A})$. Under democracy the poor hold the majority and use the state to redistribute income from the rich. As a consequence, $y_R(\mathcal{A}) > y_R(\mathcal{D}) > 0$ and $y_P(\mathcal{A}) < y_P(\mathcal{D})$. Finally, under socialism wholesale expropriation of the rich takes place and we assume that $y_R(\mathcal{S}) = 0$ and $y_P(\mathcal{S}) > y_P(\mathcal{D})$.

The poor might initiate a revolution to change the political state from autocracy to socialism. We assume that socialism is an absorbing state. During a revolution, however, some income, $\mu_{S_t^s}$, is lost. How much depends on the social state. If $S_t^s = B$, then $\mu_B = \infty$ and the poor never attempt a revolution. If, on the other hand, $S_t^s = G$, then $\mu_G = \mu < \infty$ and they might be willing to pay the price of a revolution.

The rich have a strong incentive to avoid a revolution because they lose everything. The only way to avoid a revolution is to give the poor the right to vote. This leads to a transition to democracy, as we assume throughout that the poor prefer any type of democracy to socialism. A sufficient condition is that $\mu > \underline{\mu}$ where[3]

$$\underline{\mu} \equiv \frac{y_P(\mathcal{S}) - y_P(\mathcal{D})}{1-\beta} + \frac{\beta\psi\left(y_P(\mathcal{D}) - y_P(\mathcal{A})\right)}{(1-\beta(1-2\psi)\left(1-\beta\right)}. \tag{1}$$

Such a transition may, however, be temporary only: the rich can namely mount a coup to reinstate autocracy. A coup is costly because of the turmoil it creates. As a consequence, some of the income of the rich, $\phi_{S_t^s}$, is lost during a coup. How much again depends on the social state. If $S_t^s = B$, then $\phi_B = \infty$ and the rich never attempt a coup. If, on the other hand, $S_t^s = G$, then $\phi_G = \phi < \infty$ and the rich might be willing to pay the price of a coup.

The new feature of the model is the "golden halo". Specifically, we assume that a newly established political regime after a transition to either democracy (after a process of demomcratization) or autocracy (after a coup) *may* receive a one-off gift or transfer from abroad.[4] We assume that

[1] Acemoglu and Robinson (2001) link, for concreteness, the conditions for social unrest directly to the business cycle. In fact, they assume that coups and revolutions can only take place during recessions. We prefer to focus on (exogenous) political factors.

[2] These incomes can be derived from more fundamental assumptions about endowments, production technologies and tax instruments as in Acemoglu and Robinson (2001). Doing so complicates the analysis without affecting our main results.

[3] We derive this condition in Appendix.

[4] Logically, there is a third possibility, namely that a socialistic regime (after a revolution) receives a transfer. Although this might have been important during the Cold War, we do not consider this in the present paper. We

the transfer is distributed equally across the population and denote the per-capita transfers by $\widehat{\sigma}_j \geq 0$ with $j \in \{\mathcal{A}, \mathcal{D}\}$.[5] The size of the golden halo is unknown before the transition. We assume that it is drawn from a stationary distribution with mean σ_j and variance υ_j. The draw takes place immediately after each transition and is independent of past draws. The presence of a golden halo affects, as we shall see, regime dynamics in interesting and surprising ways and provides a prediction of the theory that we can test directly.

The timing of events within each period is as follows:

1. The social state $S_t^s \in \{G, B\}$ is revealed.

2. If a revolution has happened in the past, then the political regime is socialism and the period ends and incomes are $y_i(\mathcal{S})$ for $i \in \{R, P\}$.

3. If $S_t^{Pol} = \mathcal{A}$, the rich may democratize. If $S_t^{Pol} = \mathcal{D}$, the rich may initiate a coup that leads to autocracy. If a political transition takes place, incomes are determined by the new regime; otherwise they are determined by the old regime. Another regime transition cannot happen within that period.

4. If $S_t^{Pol} = \mathcal{A}$, the poor can initiate a revolution which leads to socialism. If no revolution takes place, incomes are realized as described by stage 2 or 3.

5. Incomes are consumed and the period ends. If a political transition to either $\mathcal{A}$ or $\mathcal{D}$ happened within the period, the size of the golden halo is realised and transfer is distributed among the population.

We treat the members of the two groups as two players of a dynamic game. We restrict attention to pure strategy Markov perfect equilibria (MPEs). A Markov perfect strategy determines for each player the appropriate action as a function of the current state of the world only, i.e., $\left(S^S, \mathcal{A}\right)$, $(S^S, \mathcal{D})$ or $\mathcal{S}$ where $S^S \in \{G, B\}$. In state $(S^S, \mathcal{A})$, the action space of the rich consists of a decision to democratize or not, while in state $(S^S, \mathcal{D})$, the action space of the elite is to mount a coup or not. Since state $\mathcal{S}$ is absorbing, we need not specify the strategy of the rich in this state. When the state is $(S^S, \mathcal{A})$, a strategy of the poor is a function of the state of the world and the rich's decision to democratize or not. When the state is $(S^S, \mathcal{D})$, poor's strategy is simply a function of the state. The strategy determines the appropriate action of the poor. In state

believe that the analysis of transitions to socialism is an important topic that deserves attention, but it goes beyond the scope of the present paper to provide a proper analysis.

[5] This is a simplifying assumption that can be modified. Our results hold as long as the rich benefit from the golden halo.

$(S^S, \mathcal{A})$, their action space is a decision to mount a revolution or not, while in state $(S^S, \mathcal{D})$, they are not required to take any actions. A pure strategy Markov perfect equilibrium is then defined as a set of strategies for rich and the poor that are best responses to each other for all possible states.

3 Analysis and Results

We assume that the initial political state is autocracy. The effect of a golden halo on regime dynamics and stability depends critically on whether the poor can credibly threaten to organize a revolution to overthrow the autocracy or not. The decision to organize a revolution is made at stage 4 of the game. It is based on the following considerations. If a revolution is organized, the outcome is socialism for ever and the poor get $\frac{y_P(\mathcal{S})}{1-\beta} - \mu_{S_t^s}$. It is clear that they have no incentive to organize a revolution in social state B (as $\mu_{S_t^s} = \infty$). In social state G, on the other hand, they might organize a revolution, but it depends on how badly the poor fare under autocracy. Under (perpetual) autocracy, the poor get $\frac{y_P(\mathcal{A})}{1-\beta}$. Therefore, the poor never organize a revolution in state $(G, \mathcal{A})$ when

$$\mu \geq \mu^* \equiv \frac{y_P(\mathcal{S}) - y_P(\mathcal{A})}{1-\beta}. \tag{2}$$

When this so-called revolution constraint in binding, i.e., $\mu < \mu^*$, the rich must democratize to avoid socialism.[6] This leads to democracy. Importantly, however, the golden halo opens another path to democracy that applies even when the cost of revolution in state G is so large that the the poor never attempt a revolution ($\mu > \mu^*$). It is possible that the rich might hand over power to the poor just to trigger the golden halo!

The revolution constraint is not binding We begin the equilibrium characterization by considering the case in which the revolution constraint is never binding ($\mu > \mu^*$). The poor find it too expensive to organize a revolution whatever the social conditions are: they prefer perpetual autocracy to a revolutionary transition to socialism. In this case, any transition to democracy is voluntary but the transition is not inevitable and may not last. When the transition to democracy is for good, we say that the economy transits to *perpetual democracy.* On the other hand, when the transition to democracy is only temporary, we say that the economy transits to *unstable democracy.* In the latter case, the rich grant voting rights to the poor in the very first period, but mount a coup against the democracy at the next opportunity, for again to grant voting rights

[6] Note that $\mu^* > \underline{\mu}$.

after just one period of autocracy. Finally, if no political transitions ever take place, we say that the economy is a *perpetual autocracy.*

Since by assumption $\mu > \mu^*$, the poor never attempt a revolution at stage 4. Anticipating that at stage 3, the rich effectively face the choice between three strategies:

1. Perpetual autocracy: Irrespective of the social state, the rich never democratize. The economy continues to be autocratic and the rich get $\frac{y_R(\mathcal{A})}{1-\beta}$.

2. Perpetual democracy: Irrespective of the social state, the rich democratize in the first period and never attempt a coup in subsequent periods. The economy is a democracy for ever and the rich expect to get $\frac{y_R(\mathcal{D})}{1-\beta} + \sigma_{\mathcal{D}}$ where $\sigma_{\mathcal{D}}$ is the expected value of the golden halo after a democratization.

3. Unstable democracy: Irrespective of the social state, the rich democratize each time the political state is $\mathcal{A}$ and initiate a coup each time the state is $(G, \mathcal{D})$.[7] The rich expect to get[8]

$$\frac{y_R(\mathcal{D}) + \psi\beta y_R(\mathcal{A}) + (1-(1-\psi)\beta)\sigma_{\mathcal{D}} + \psi\beta(\sigma_{\mathcal{A}} - \phi)}{(1-\beta)(1+\psi\beta)} \tag{3}$$

   where $\sigma_{\mathcal{D}}$ and $\sigma_{\mathcal{A}}$ are the expected values of the golden halo after a transition to democracy and autocracy, respectively.

The equilibrium strategy of the rich depends on the value of $\sigma_{\mathcal{D}}$, $\sigma_{\mathcal{A}}$ and ϕ. We can defined the following three threshold values. Firstly, a direct comparison between strategy 1 and 2 shows that the rich prefer perpetual democracy to perpetual autocracy if and only if $\sigma_{\mathcal{D}} > \sigma^1_{\mathcal{D}}$ where

$$\sigma^1_{\mathcal{D}} = \frac{y_R(\mathcal{A}) - y_R(\mathcal{D})}{1-\beta}. \tag{4}$$

Secondly, a comparison between strategy 1 and 3 shows that the rich prefer unstable democracy to perpetual autocracy if and only if $\sigma_{\mathcal{D}} > \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$ where

$$\sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}}) = \frac{y_R(\mathcal{A}) - y_R(\mathcal{D})}{1-(1-\psi)\beta} + \frac{\psi\beta(\phi - \sigma_A)}{1-(1-\psi)\beta}. \tag{5}$$

Thirdly, comparing strategies 2 and 3, we see that the rich prefer unstable democracy to perpetual

[7] If democratization should be followed by a coup, it is never optimal for the elite to democratize and then not to initiate a coup the first time after that $S^S_t = G$. Thus, we can focus on the comparison of strategy 2 and strategy 3.

[8] See Appendix for details.

democracy if and only if $\sigma_{\mathcal{D}} > \sigma^3_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$ where

$$\sigma^3_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}}) = -\frac{y_R(\mathcal{A}) - y_R(\mathcal{D})}{\beta} + \frac{(\phi - \sigma_A)}{\beta}. \tag{6}$$

Given these thresholds, we can state the following result.

Proposition 1 *Suppose the initial political state is autocracy and that $\mu > \mu^*$. Then for all $\sigma_{\mathcal{D}} \neq \left\{\sigma^1_{\mathcal{D}}, \sigma^2_{\mathcal{D}}, \sigma^3_{\mathcal{D}}\right\}$ there exists a unique pure strategy MPE such that*

1. *If $\sigma_{\mathcal{D}} > \max\left\{\sigma^2_{\mathcal{D}}, \sigma^3_{\mathcal{D}}\right\}$ then the economy becomes an unstable democracy. The rich democratize each time the political state is $\mathcal{A}$ and mount a coup each time the state is $(G, \mathcal{D})$.*

2. If $\sigma_{\mathcal{D}} > \sigma^1_{\mathcal{D}}$ and $\sigma_{\mathcal{D}} < \sigma^3_{\mathcal{D}}$, then the economy *becomes a perpetual democracy. The rich democratize in the first period and never attempt a coups after that.*

3. Otherwise, the economy is a perpetual autocracy.

Proof. Begin by noting the following facts about the three thresholds defined in the text above. There exists a value of the cost of a coup, $\widetilde{\phi}$, such that i) $\sigma^2_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) = \sigma^3_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) = \sigma^1_{\mathcal{D}}$, ii) $\sigma^1_{\mathcal{D}} \geq \sigma^2_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) \geq \sigma^3_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}})$ for $\phi \leq \widetilde{\phi}$ and iii) $\sigma^3_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) > \sigma^2_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) > \sigma^1_{\mathcal{D}}$ for $\phi > \widetilde{\phi}$. The optimal strategy of the poor is to never initiate a revolution. Given that, the decision of the rich to democratize or not is independent of the social state and the rich democratize only when it is in their interest to do so. The rich prefer unstable democracy to perpetual autocracy or democracy if and only if $\sigma_{\mathcal{D}} > \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$ and $\sigma_{\mathcal{D}} > \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$. The rich prefer perpetual democracy to perpetual autocracy or unstable democracy if and only if $\sigma_{\mathcal{D}} > \sigma^1_{\mathcal{D}}$ and $\sigma_{\mathcal{D}} < \sigma^3_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$. The rich prefer perpetual autocracy to the other alternatives if and only if $\sigma_{\mathcal{D}} < \sigma^1_{\mathcal{D}}$ and $\sigma_{\mathcal{D}} < \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$. The equilibrium strategy of the rich then is i) if $\sigma_{\mathcal{D}} > \max\left\{\sigma^2_{\mathcal{D}}, \sigma^3_{\mathcal{D}}\right\}$, democratize when the state is $(S^S, \mathcal{A})$ for $S^S \in \{B, G\}$, mount a coup when the state is $(G, \mathcal{D})$, and do nothing when the state is $(B, \mathcal{D})$; ii) if $\sigma_{\mathcal{D}} > \sigma^1_{\mathcal{D}}$ and $\sigma_{\mathcal{D}} < \sigma^3_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$, democratize in period 1 irrespective of the social state and never attempt a coup; iii) If $\sigma_{\mathcal{D}} < \min\left\{\sigma^1_{\mathcal{D}}, \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})\right\}$, never democratize and never attempt a coup ■

In the absence of a credible threat of revolution ($\mu > \mu^*$) and with the average golden halo being zero ($\sigma_{\mathcal{D}} = \sigma_{\mathcal{A}} = 0$), the only possible equilibrium outcome is, as in Acemoglu and Robinson (2001), perpetual autocracy. So, expectations of a golden halo may induce democratization in situations where autocracy would otherwise have been perpetual. This is illustrated in Figure 1.

What is required is that the expected value of the golden halo to a newly established democracy ($\sigma_{\mathcal{D}}$) is sufficiently large. The stability of the emerging democracy depends on the cost of a coup relative to the size of the expected value of the golden halo. For low values of ϕ (in area UD), the economy experiences repeated regime switches. For sufficiently high values of ϕ and moderately high values of σ_D (in area PD) perpetual democracy emerges. Interestingly, even if $\sigma_{\mathcal{D}} = 0$ and a newly established democracy cannot expect to be rewarded with a golden halo, it is still possible that the rich democratize voluntarily. This happens if unstable democracy yields higher payoff than perpetual autocracy (which for $\sigma_{\mathcal{D}} = 0$ is preferred by the rich to perpetual democracy). A simple calculation shows that this requires that $\sigma_{\mathcal{A}} \geq \frac{y_R(\mathcal{A})-y_R(\mathcal{D})}{\psi\beta} + \phi$. Thus, if the expected golden halo to a newly established autocracy is sufficiently larger, it is optimal for the rich to democratize, not because this is desirable in itself, but because of the expectation of the golden halo triggered when the rich take power back in a future coup. The area labeled PA corresponds to the equilibrium with perpetual autocracy.

The revolution constraint is binding Next, suppose that the revolution constraint binds ($\mu < \mu^*$), that is, the poor would organize a revolution whenever social conditions are favorable. In this case, the transition to democracy is inevitable: the rich will grant voting rights to avoid the transition to socialism and this is independent of the presence of the golden halo. Clearly, if the rich were willing to grant voting rights in the absence of a credible threat of revolution, they continue to show this willingness when the threat is credible. In other words, for $\sigma_{\mathcal{D}} > \max\left\{\sigma^2_{\mathcal{D}}, \sigma^3_{\mathcal{D}}\right\}$ or $\sigma_{\mathcal{D}} > \sigma^1_{\mathcal{D}}$ and $\sigma_{\mathcal{D}} < \sigma^3_{\mathcal{D}}$, the equilibrium strategies are as described in proposition 1 and the economy either transits to perpetual or unstable democracy as appropriate. So, the revolution constraint only makes a difference when the rich in the absence of a credible threat of revolution prefer perpetual autocracy to the alternatives (i.e., when $\sigma_{\mathcal{D}} < \sigma^1_{\mathcal{D}}$ and $\sigma_{\mathcal{D}} < \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$). For the rest of the section we assume that is the case.

We make a distinction between two types of democracy that might emerge: Consolidated democracy emerges when the transition is permanent. In contrast, unconsolidated democracy emerges when the transition is only temporary. In this case, the rich mount a coup at the next opportunity (in state $(G, \mathcal{D})$), for again to issue voting rights when the situation requires it (in state $(G, \mathcal{A})$).[9] Whether the democracy consolidates or not depends on the incentives of the rich

[9]Notice that consolidated democracy differs from perpetual democracy because autocracy may persist for some periods (until the first time the social state is G). Unconsolidated democracy differs from unstable democracy because a coup is followed by a period of autocracy (until the next time the social state is G) rather than by an immediate transition back to democracy.

to mount coups. This incentive is controlled by the so-called coup constraint. To derive this constraint suppose that the political state is democracy and let $W_i(S_t^{Pol})$ be the continuation value for group i when the political state is S_t^{Pol}. Clearly, in social state B, the rich will not mount a coup because $\phi_B = \infty$. In social state B, the situation is different. If they don't mount a coup they get $y_R(\mathcal{D}) + \beta W_R(\mathcal{D})$ and if they do, the coup triggers a golden halo to the new autocracy and they expect to get $y_R(\mathcal{A}) - \phi + \sigma_D + \beta W_R(\mathcal{A})$. The rich will never mount a coup if

$$\phi > y_R(\mathcal{A}) - y_R(\mathcal{D}) + \beta\left(W_R(\mathcal{A}) - W_R(\mathcal{D})\right) + \sigma_{\mathcal{A}}. \tag{7}$$

Since, by assumption, the current political state is democracy, it must be true that the rich were forced to democratize the last time the state was $(G, \mathcal{A})$ and that they will have to do so again next time the state is $(G, \mathcal{A})$. This is implies that the value of autocracy is

$$W_R(\mathcal{A}) = \psi\left(y_R(\mathcal{D}) + \sigma_{\mathcal{D}} + \beta W_R(\mathcal{D})\right) + (1-\psi)\left(y_R(\mathcal{A}) + \beta W_R(\mathcal{A})\right), \tag{8}$$

where we notice that the possible transition back to democracy if the social state is G in the next period triggers another golden halo with expected value $\sigma_{\mathcal{D}}$, this time to the new democracy. Combining this with the observation that $W_R(\mathcal{D}) = y_R(\mathcal{D}) + \beta W_R(\mathcal{D})$ under condition (7), we can write the coup constraint as

$$\sigma_{\mathcal{D}} < \frac{(\phi - \sigma_{\mathcal{A}})\left(1 - (1-\psi)\beta\right)}{\psi\beta} - \frac{y_R(\mathcal{A}) - y_R(\mathcal{D})}{\beta\psi} \equiv \sigma_{\mathcal{D}}^4(\phi, \sigma_{\mathcal{A}}). \tag{9}$$

The cut-off $\sigma_{\mathcal{D}}^4$ has a natural interpretation. The rich are only willing to mount a coup if it pays off. This is less likely to be case if the net expected cost of a coup $(\phi - \sigma_{\mathcal{A}})$ is high or when the payoff differential between democracy and autocracy, $y_R(\mathcal{A}) - y_R(\mathcal{D})$, is small.

The next proposition characterizes equilibrium outcomes for the case with a binding revolution constraint and in which the rich prefer perpetual autocracy to any form of voluntary democracy.

Proposition 2 *Suppose the initial political state is autocracy. Furthermore, assume that $\mu < \mu^*$ and $\sigma_{\mathcal{D}} < \min\left\{\sigma_{\mathcal{D}}^1, \sigma_{\mathcal{D}}^2(\phi, \sigma_{\mathcal{A}})\right\}$. Then for all $\sigma_{\mathcal{D}} \neq \sigma_{\mathcal{D}}^4$ there exists a unique pure strategy MPE such that*

1. *If $\sigma_{\mathcal{D}} < \sigma_{\mathcal{D}}^4$, then the economy becomes a consolidated democracy. The rich democratize the first time the social state is G and never attempts a coups after that.*

2. *If $\sigma_{\mathcal{D}} > \sigma^4_{\mathcal{D}}$, then the economy becomes an unconsolidated democracy. The rich democratize each time the state is $(G, \mathcal{A})$ and mount a coup each time the state is $(G, \mathcal{D})$.*

Proof. The initial political state is $\mathcal{A}$. In autocracy, the poor moves after the rich. In state $(B, \mathcal{A})$, the best response of the poor no matter what the rich do is not to oreganize a revolution. Anticipating that, the elite does not democratize (as $\sigma_{\mathcal{D}} < \min\left\{\sigma^1_{\mathcal{D}}, \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})\right\}$). In state $(G, \mathcal{A})$, the poor will organize a revolution if the rich do not democratize. Anticipating this, the best response of the rich is to democratize. In state $(B, \mathcal{D})$, the poor do to not make any choice. The rich will not mount a coup because the cost of doing so is infinite. In state $(G, \mathcal{D})$, the poor do not make any choice. The rich will mount a coup if $\sigma_{\mathcal{D}} > \sigma^4_{\mathcal{D}}$ and not mount one otherwise. To complete the proof, we need to show that both cases are consistent with $\sigma_{\mathcal{D}} < \min\left\{\sigma^1_{\mathcal{D}}, \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})\right\}$. We notice that there exist a unique $\widetilde{\phi} = \frac{y_R(\mathcal{A}) - y_R(\mathcal{D})}{1-\beta} + \sigma_A$ such that $\sigma^2_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) = \sigma^4_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) = \sigma^1_{\mathcal{D}}$. Moreover, at $\phi = 0$, $\sigma^4_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}}) < \sigma^2_{\mathcal{D}}(\widetilde{\phi}, \sigma_{\mathcal{A}})$. This implies that for $\phi \in [0, \widetilde{\phi})$ there exist values of $\sigma_{\mathcal{D}}$ such that $\sigma_{\mathcal{D}} < \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$ and $\sigma_{\mathcal{D}} > \sigma^4_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$ and that there exist values $\sigma_{\mathcal{D}}$ such that $\sigma_{\mathcal{D}} < \sigma^4_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}}) < \sigma^2_{\mathcal{D}}(\phi, \sigma_{\mathcal{A}})$ ■

Intuitively, the proposition shows that consolidated democracy emerges when the cost of a coup is high, while unconsolidated democracy with frequent regime changes arises when the cost is sufficiently low. This is illustrated in Figure 2. Area CD corresponds to consolidated democracy and area UCD corresponds to unconsolidated democracy. Importantly, regime dynamics is affected directly be the presence of the golden halo. In particular, we have:

Proposition 3 *(Golden Hallo) An increase in the expected value of the golden halo increases regime instability by making a transition to unconsolidated democracy more likely.*

Proof. The proposition follows from the fact that unconsolidated democracy is more likely when $\sigma_{\mathcal{D}}$ is large and that $\frac{\partial \sigma^4_{\mathcal{D}}}{\partial \sigma_{\mathcal{A}}} = \frac{1-\beta(1-\psi)}{\beta\psi} > 0$ ■

The proposition shows that the expectation of a golden halo may cause an otherwise consolidated democracy to become unconsolidated and induce regime volatility. The intuition for this result is straight forward: regime volatility triggers frequent golden halos.

4 An Empirical Test

The testable implication of the extended version of Acemoglu and Robinson's (2001) theory of political transition is clear-cut: the expectation of a golden halo increases the probability of a

regime change. It causes regime instability. Exogenous variations in the expected value of the golden halo causes exogenous shifts in the coup constraint that can help us identify the impact on the regime transition probability and/or on regime duration.

4.1 The Testing Strategy

More specifically, according to the theory the decision to democratize or to overthrow an existing democracy is affected by *expectations* about a golden halo. In other words,

$$\Pr(PT_{it} = 1) = F(GH^e_{it-1}; X_{it})$$

where PT is equal to one if a regime transition takes place at time t in country i, and X_{it} is a vector of observable factors that affect the probability of a regime transition. The key variable is GH^e_{it-1}. It represents the expectation formed at time $t-1$ that the country will receive a golden halo at time t if a political transition takes place. The theoretical prediction is that $\frac{\partial F}{\partial GH^e_{it-1}} > 0$.

We measure GH^e_{it-1} in two alternative ways. Firstly, suppose that the political actors form rational expectations such that given all available information, on average, they get it right. Empirically, we approximate the rational expectation by the lead of an indicator variable that takes the value 1 if a golden halo was received after a transition. In other words, we ask if a country that perfectly anticipates getting a golden halo is more likely to undergo a transition than a country that (correctly) anticipates not getting one.

Secondly, we suppose that the political actors use an adoptive strategy to estimate the likelihood that a golden halo will be forthcoming. In this case, they will be looking at the country's own past experience and/or at the experience of their neighbors to estimate the likelihood that a regime transition will trigger a golden halo. To implement this, we define a neighborhood N and calculate GH^e_{it-1} for each year as the weighted sum of all past golden halos in that neighborhood as follows:

$$GH^e_{it-1} = \sum_{i=1}^{N} \sum_{\tau=1}^{t-1} \left(x_{-i,t-1} + \lambda^{-\tau} x_{i,t-1-\tau} \right) \tag{10}$$

where x_{it} is 1 if country $i \in N$ in year $\tau \leq t-1$ get a golden halo and zero otherwise. $\lambda \in (0,1)$ is a weighting parameter. The idea is that golden halos in the more distant past might carry less weight. Depending on the definition of N, equation (10) encompasses three special cases that we shall make use of in the estimations. One specification is to restrict the neighborhood to the country itself. This is very restrictive in terms of the information that political agents use to

predict if a golden halo is likely to be forthcoming. It is also possible that golden halos in the past are correlated with unobserved factors that also affect political transitions in that country. If so, this will bias the inference. This concern motivates our two other specifications. In our second specification, we defined the neighborhood as the rest of the world, excluding the country itself. This is a very large neighborhood and our third specification reduces the size of the neighborhood to the region in which the country is located. For this we take the definitions of world regions as implemented by the World Bank. To have substantially large regions we combine following World Bank regions to arrive at a total of five regions.

To implement this test, we need to define what we mean by a golden halo and what we mean by a regime transition. A Golden Halo is defined as any a new Structural Adjustment and Growth Facility or Poverty Reduction and Growth Facility from the IMF or any structural adjustment loan from the World Bank within a two years window after a regime transition. We choose these types of agreement because they are concessional loans and as such represent the most benefits for the recipient.

To proxy a political regime change we use the dichotomous regime indicator developed by Przeworski et al. (2000). A democracy is the political system in which key government offices are filled through contested elections. The definition has two parts: "key government office," which they define as the executive and the legislature; and "contested," which implies that more than one party has a chance of winning office through election. Elections must be associated with some *ex ante* uncertainty, and be subject to *ex post* irreversibility. Put succinctly, "democracy is a system in which incumbents lose elections and leave office when the rules so dictate" (Przeworski et al. 2000, p.54). A regime change is define whenever a switch from democracy to autocracy or vice versa occurs.

Before going into the econometric details let us quickly look at the raw data in order to evaluate whether Golden Halos are of any potential importance in triggering regime changes. As noted in the introduction there are some well known instances in which Golden Halos occurred. A closer look at the data reveals that there have been 16 democratic (i.e., shifts from autocracy to democracy) and four autocratic IMF halos as well as 49 democratic and 13 autocratic World Bank halos. The numbers of course have to be contrasted with the total numbers of political regime changes. In our sample of 108 countries for the years 1970 – 2002 there were 72 transitions to democracy and 29 autocratic transitions. We see that while regime transitions are infrequent events they are often accompanied by Golden Halos. In order to be able to see whether these apparent

relationship can be given a causal interpretation we now turn to the econometric analysis.

As we have seen from the theoretical model, whether a regime change takes place or not crucially depends of the social state, G or B. In order to proxy the realization of G or B empirically, we follow existing literature. In particular, we take the suggestion of Przeworski et al. (2000) into account and distinguish between a transition from an autocracy to a democracy and vice versa as these two phenomena could have different determinants.[10] In deed, Gassebner, Lamla and Vreeland (2009) have undertaken an extreme bounds analysis (EBA) to establish which of the many potential determinants of regime transition proposed in a vast empirical literature are robust.[11] They find that the set of variables triggering the two types of regime switches differ. We use the variables that they find to be robustly related to regime transitions as our baseline and add our golden halo variables to this specification. We follow the suggestion of Przeworski et al. (2000) as well as Gassebner, Lamla and Vreeland (2009) and model the probability of observing democracy at year t as a first order Markov process. Let D be a dummy variable coded 1 if a country is a democracy, and 0 otherwise. Then,

$$\Pr\left(D_{i,t}|D_{i,t-1}\right) = \left(1 - D_{i,t-1}\right) \cdot \Pr\left(D_i, t|D_{i,t-1} = 0\right) + \left(D_{i,t-1}\right) \cdot \Pr\left(D_i, t|D_{i,t-1} = 1\right) \tag{11}$$

As the likelihood function for this model is additively separable, it can be easily estimated as two logistic functions with the transition probabilities defined as follows:

$$\Pr\left(D_{i,t}|D_{i,t-1} = 0\right) = \Lambda\left(\beta^{AD} x_{i,t-1}^{AD}\right) \tag{12}$$

$$\Pr\left(D_{i,t}|D_{i,t-1} = 1\right) = \Lambda\left(\beta^{DD} x_{i,t-1}^{DD}\right), \tag{13}$$

where Λ is the cumulative distribution function of the logistic distribution, AD denotes transition from ***A***uthoritarianism to ***D***emocracy and DD the survival of democracy, i.e, the flipside of a transition from democracy to autocracy. $x_{i,t-1}^{DD}$ and $x_{i,t-1}^{DD}$ are the two vector of (lagged) variables that determine these two processes, i.e., G and B. According to the findings of Gassebner, Lamla and Vreeland (2009) these are a membership dummy for the OECD, the Muslim share in the population, the share of fuel exports in merchandise exports and GDP growth (for transitions from democracy to autocracy) and GDP per capita, a dummy variable indicating that the head of state is a (former) military officer and the level of democracy in the neighboring countries (for

[10] As we will see, in line with the existing literature we will be modeling the probability of democratic survival which is just the flip side of a switch from democracy to autocracy.

[11] Surveying the existing literature Gassebner, Lamla and Vreeland test the robustness of a total of 59 variables.

the survival probability of democracies). Interestingly, previous regime transitions stimulate both the probability of transitions from democracy to autocracy and from autocracy to democracy. It is hence the only variable other than our golden halo variables that is included in both setups.

Next, we must construct our empirical proxies for the golden halos. We distinguish between golden halos which are induced by the World Bank and by the IMF. The reason for this that monetary flows from these two institution could in principle have different effects. For example, Dreher and Gassebner (2008) show that while World Bank programs which are concluded in times of no need lead to political turmoil the same is not true for IMF programs. We define as golden halos IMF and World Bank programs which take place within two years of a political regime change. In our most simple model, the perfect anticipation model we therefore include the contemporaneous values of IMF and World Bank programs plus the first two leads of theses. To be more precise: IMF program is a dummy variable when a new IMF program starts (as, in general, one can only be under one IMF program in a given year), while the World Bank covers all new World Bank structural adjustment loan (as at any give time more than one program can start).[12] The result is presented in the first column of Tables 1 and 2. The estimated probability of a move from autocracy to democracy is displayed in Table 1. Regarding the covariates no surprises arise. In line with Przeworski at al. (2000) and Gassebner, Lamla and Vreeland (2009) we find that GDP per capita does not facilitate democratic transitions. However, previous experience with regime changes does. Moreover, becoming a member of the OECD also stimulates a democratic transition.[13] Muslim countries are less likely to transform into democracies. As Gassebner et al. (2009) show this effect is driven by the oil rich Arab countries. This is also the reason for the statistical insignificance of the coefficient on fuel exports: the two variables are collinear. Our final control variable, economic growth, is turns out to be statistically insignificant as well.

Turning to our central variables, we see the result of the perfect anticipation model in specification (1). In particular we see that the second lead of the IMF exhibits a statistically significant relationship with democratic transitions. We must stress that this relationship is not only relevant in statistical terms. The corresponding marginal effect indicates that (at the mean of all variables) a perfectly anticipated IMF program in two years increases the likelihood of a democratic transition by six percent. This is very large given that the unconditional probability of a shift to democracy is only two percent in our sample. In specification (2) we turn to the own histories

[12]The source for the IMF is Dreher (2006) while data on World Bank loans are taken from the webpage of the World Bank.

[13]This finding may seem trivial or tautological. It is not, however, Greece, Portugal, Spain, Turkey, and Mexico entered the OECD as autocratic countries and transformed into democracies only after being a member.

of democratic golden halos. We exclude the current spell and only count previous halos which occurred at a previous democratic transition. As detailed in equation (10) we also incorporated a discount factor. As there is no clear rule regarding the value of the discount factor we do a grid search and choose the discount factor which maximizes the log-likelihood. It turns out that this value is one, i.e. no discounting of the past. Due to our very strict rule of excluding the current spell and only counting previous golden halos that occurred during a democratic transition we have no observations for the IMF. The measure for the World Bank indicates that a previous democratic halo increases the likelihood of a democratic transition by 0.8 percent. While this is not as large as the estimated effect from the perfect forecast model it is still very sizable relative to the two percent unconditional probability. Moreover, given that this measure excludes the current spell, i.e., is at least three years in the past we can give this results a truly causal interpretation. Moreover, as seen in specification (3) the findings of (1) and (2) remain unchanged if entered simultaneously. In specification (4) we see that the world history does not seem to play a major role in determining democratic transitions.

In Table 2, we analyze the probability of democratic survival, the flip side of an autocratic transition. Again we conform the findings of Przeworksi et al. (2000) and Gassebner et al. (2009). We also find that rich democracies are more likely to remain a democracy. Moreover, we also find that previous regime transitions decrease the probability of democratic survival (i.e., they increase the probability of a transition to autocracy). We do not find a statistically significance of either political leaders who are or were military officers or the effect of being surrounded by democracies. However, in specification (1) we see that the perfect foresight model exhibits a statistically significant result regarding World Bank loans, Again, this is a sizable effect. Again this effect is not only statistically relevant. The marginal effect indicates that a perfectly anticipated loan in two years decreases the survival probability by 0.5 percent. We note that the unconditional probability of democratic survival is 98 percent. Un fotunately we have no observations for the own history, due to the fact that no country turn twice into an autocracy in our sample. Just as above the world history does not seem to play a major role.

Table 1: Transitions to democracy, 1970 - 2002

	(1)	(2)	(3)	(4)
log GDP p.c. PPP, t-1	0.00995	-0.0452	0.0433	-0.182
	(0.207)	(0.190)	(0.211)	(0.194)
Previous transitions, t-1	0.472***	0.437***	0.430***	0.508***
	(0.123)	(0.114)	(0.122)	(0.122)
OECD, t-1	2.431***	2.536***	2.387***	2.727***
	(0.774)	(0.517)	(0.849)	(0.570)
Muslim	-1.434***	-1.829***	-1.786***	-1.518***
	(0.503)	(0.633)	(0.642)	(0.516)
Share of fuel exports, t-1	-0.0063	-0.0065	-0.0051	-0.0085
	(0.0096)	(0.0097)	(0.0097)	(0.0091)
GDP growth, t-1	-0.0481	-0.0473	-0.0498	-0.0467
	(0.0320)	(0.0302)	(0.0323)	(0.0333)
New IMF program	0.403		0.171	
	(1.103)		(1.103)	
New IMF program, t+1	-0.150		-0.409	
	(1.131)		(1.166)	
New IMF program, t+2	1.429*		1.400*	
	(0.735)		(0.737)	
New World Bank program	-0.505		-0.510	
	(0.459)		(0.478)	
New World Bank program, t+1	0.527		0.540	
	(0.360)		(0.360)	
New World Bank program, t+2	-0.345		-0.316	
	(0.444)		(0.436)	
Own history of World Bank Halos		0.388*	0.411*	
		(0.214)	(0.247)	
World History of IMF Halos				-0.201
				(0.175)
World History of World Bank Halos				0.0802
				(0.0624)
Observations	939	942	939	942
R-squared	0.149	0.145	0.154	0.148

Notes: The table reports logit regressions conditional on being autocratic in $t-1$. Standard errors are given in parentheses below coefficient. */**/*** indicate significance at the 10/5/1 %-level.

Table 2: Democratic survival, 1970 - 2002

	(1)	(2)
	(1)	(2)
log GDP p.c. PPP, t-1	1.988***	1.806***
	(0.480)	(0.386)
Military leader, t-1	-0.946	-0.766
	(0.605)	(0.668)
Neighboring democracies	1.388	1.223
	(1.074)	(1.129)
Previous transitions, t-1	-0.648**	-0.701**
	(0.305)	(0.315)
New IMF program	-0.148	
	(1.133)	
New IMF program, t+2	0.393	
	(1.005)	
New World Bank program	0.506	
	(0.640)	
New World Bank program, t+1	0.881	
	(0.537)	
New World Bank program, t+2	-0.959**	
	(0.455)	
World History of IMF Halos		-0.276
		(0.603)
World History of World Bank Halos		0.107
		(0.123)
Observations	549	966
R-squared	0.281	0.311

Notes: The table reports logit regressions conditional on being democratic in $t-1$. Standard errors are given in parentheses below coefficient. */**/*** indicate significance at the 10/5/1 %-level.

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5 Appendix

Deriving condition (3) The poor benefit from a transition to democracy for two reasons. Firstly, their income is higher than under autocracy (but lower than under socialism). Secondly, they share in the golden halo or halos if multiple transitions take place. We are seeking a condition

that ensures that the poor will "cancel" the revolution if the rich grant them voting rights. In the absence of the golden halo, unconsolidated democracy, understood as a situation in which the rich grant voting rights when the state is $(G, \mathcal{A})$ and mount a coup when the state is $(G, \mathcal{D})$, defines a lower bound on the welfare of the poor under democracy. Thus, if this can prevent a revolution by dominating a transition to socialism for $\sigma_{\mathcal{D}} = \sigma_{\mathcal{A}} = 0$, so can any other type of democracy with or without a golden halo. Formally, we seek a condition that ensures

$$\frac{y_P(\mathcal{S})}{1-\beta} - \mu \leq y_P(\mathcal{D}) + \sigma_{\mathcal{D}} + \beta W_P(\mathcal{D}) \tag{14}$$

where

$$W_P(\mathcal{D}) = \psi\left(y_P(\mathcal{A}) + \sigma_{\mathcal{A}} + \beta W_P(\mathcal{A})\right) + (1-\psi)\left(y_P(\mathcal{D}) + \beta W_P(\mathcal{D})\right)) \tag{15}$$

and

$$W_P(\mathcal{A}) = \psi\left(y_P(\mathcal{D}) + \sigma_{\mathcal{D}} + \beta W_P(\mathcal{D})\right) + (1-\psi)\left(y_P(\mathcal{A}) + \beta W_P(\mathcal{A})\right). \tag{16}$$

This yields two equations in two unknown, which we can solve to get

$$W_P(\mathcal{D}) = \frac{\psi y_P(\mathcal{A}) + (1-\beta(1-2\psi)-\psi)y_P(\mathcal{D}) + \beta\psi^2\sigma_{\mathcal{D}} + (1-\beta(1-\psi))\psi\sigma_{\mathcal{A}}}{(1-\beta(1-2\psi))(1-\beta)} \tag{17}$$

$$W_P(\mathcal{A}) = \frac{\psi y_P(\mathcal{D}) + (1-\beta(1-2\psi)-\psi)y_P(\mathcal{A}) + \beta\psi^2\sigma_{\mathcal{A}} + (1-\beta(1-\psi))\psi\sigma_{\mathcal{D}}}{(1-\beta(1-2\psi))(1-\beta)}. \tag{18}$$

For $\sigma_{\mathcal{D}} = \sigma_{\mathcal{A}} = 0$, substitution of this into equation (14) and rearrange gives

$$\mu \geq \frac{y_P(\mathcal{S}) - y_P(\mathcal{D})}{1-\beta} - \frac{\beta\psi\left(y_P(\mathcal{A}) - y_P(\mathcal{D})\right)}{(1-\beta(1-2\psi))(1-\beta)} \equiv \underline{\mu}. \tag{19}$$

This is a condition that only depends on the parameters of the model, not on the strategies of the elite and workers and it is sufficient, not necessary, to prevent a revolution.

Deriving condition (3) We want to calculate the value of following strategy 3 starting from $S_t^{Pol} = \mathcal{A}$. Since the rich democratize no matter what the social state is, the value is

$$W_R(\mathcal{A}) = y_R(\mathcal{D}) + \sigma_{\mathcal{D}} + \beta W_R(\mathcal{D}). \tag{20}$$

To evaluate this, we need to calculate the continuation value starting from $S_t^{Pol} = \mathcal{D}$, i.e., $W_R(\mathcal{D})$. If the social state is G the rich mount a coup and there is a transition to autocracy and if the

social state is B, the rich does nothing and the democracy persist for another period. We can therefore write

$$W_R(\mathcal{D}) = \psi\left(y_R(\mathcal{A}) - \phi + \sigma_{\mathcal{A}} + \beta W_R(\mathcal{A})\right) + (1-\psi)\left(y_R(\mathcal{D}) + \beta W_R(\mathcal{D})\right). \tag{21}$$

Solving this equation for $W_R(\mathcal{D})$ gives

$$W_R(\mathcal{D}) = \frac{\psi\left(y_R(\mathcal{A}) - \phi + \sigma_{\mathcal{A}} + \beta W_R(\mathcal{A})\right) + (1-\psi)\, y_R(\mathcal{D})}{1-\beta(1-\psi)} \tag{22}$$

Substituting this back into equation (20) and rearrange gives equation (3)

Figure 1: Equilibrium configurations when the revolution constraint is not binding.

Figure 2: Equilibrium configurations when the revolution constraint is binding.