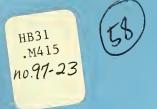58

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WHY DID THE WEST EXTEND THE FRANCHISE?
DEMOCRACY, INEQUALITY AND GROWTH
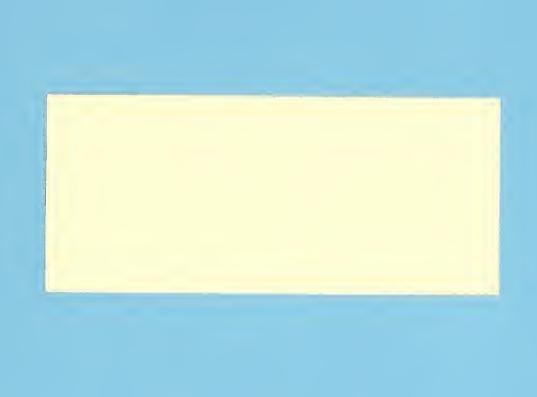## IN HISTORICAL PERSPECTIVE

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WHY DID THE WEST EXTEND THE FRANCHISE?
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Why Did the West Extend the Franchise? Democracy, Inequality and Growth in Historical Perspective[*]

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Abstract

During the nineteenth century, most Western societies extended the franchise, a decision which led to unprecedented redistributive programs. We argue that these political reforms can be viewed as strategic decisions by political elites to prevent widespread social unrest and revolution. Political transition, rather than redistribution under existing political institutions, occurs because current transfers do not ensure future transfers, while the extension of the franchise changes the future political equilibrium and acts as a commitment to future redistribution. Our theory offers a novel explanation for the Kuznets curve, whereby the fall in inequality follows redistribution due to democratization. We characterize the conditions under which an economy experiences the development path associated with the Kuznets curve, as opposed to two non-democratic paths; an "autocratic disaster", with high inequality and low output; and an "East Asian Miracle", with low inequality and high output.

Keywords: Democracy, Enfranchisement, Growth, Inequality, Political Commitment, Redistribution, Revolution.
JEL Classification: D72, O15.

1

1 Introduction

The nineteenth century was a period of fundamental political reform and unprecedented changes in taxation and redistribution. For example, British society was transformed from an "autocracy" run by an elite to a democracy. The franchise was extended in 1832, then again in 1867 and 1884, a process which transferred voting rights to portions of the society which did not previously have any political representation. The decades after the political reforms witnessed radical social reforms, increased taxation and the extension of education to the masses. Finally, as noted by Kuznets, inequality, which had previously been increasing, started to decline during this period: the Gini coefficient for income inequality in England and Wales had risen from 0.400 in 1823 to 0.627 in 1871, and fell to 0.443 in 1901. Two key factors in the reduction in inequality were the increase in the proportion of skilled workers (Williamson, 1985), and redistribution towards the poorer segments of the society; for example, taxes rose from 8.12% of National Product in 1867 to 18.8% by 1927, and the progressivity of the tax system was increased substantially (Lindert, 1989). During the late nineteenth and early twentieth centuries, the franchise was also extended in most other Western societies. Those for which data exist (e.g. France, Germany and Sweden) show that democratization was followed by increased redistribution and the downturn of the Kuznets curve.[1]

These events are hard to understand with our existing models. If democratization is likely to lead to increased taxation and redistribution (e.g. Meltzer and Richard, 1981), why should the elite extend the voting rights? Our answer is that the elite, who held political power, were forced to extend the franchise because of the threat of revolution.[2] In particular, we argue that democratization alters future political equilibria by changing the identity of the median voter, thus acts as a commitment to future redistribution, and prevents social unrest. In contrast to democratization, the promise by the elite to redistribute in the future while maintaining political power is not credible. Somewhat paradoxically, we find that in economies where the masses are politically organized, the promise of future redistribution is more credible, and so the elite can avoid a revolution

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[1]A country which exhibits a Kuznets curve, but some time after full democratization is the U.S.. We return to this case in the concluding section.

[2]The threat of revolution can intensify either because inequality increases (see for example Muller and Seligson, 1987, on the strongly positive relation between income inequality and political instability) or because of some unusual event such as wars, depressions and famines.

without extending the franchise. This may explain why in the nineteenth century, while Britain and France extended the franchise in the face of heightened social unrest and inequality, Germany which had the most organized working class in Europe instituted the welfare state, but did not extend voting rights until much later (after the turmoil of the First World War).

The second contribution of our paper is to point out the link between democratization and the Kuznets curve. We argue that the increase in inequality in Western economies was an important factor in increased social unrest which led to the extension of the franchise. Democratization, in turn, increased redistribution and was instrumental in reducing inequality. As predicted by our approach, in Britain, France, Germany and Sweden, the peak of the Kuznets curve coincides with the extension of the franchise. Although our model explains the Kuznets curve, it does not predict that this pattern should be a feature of all development processes (which accords with the empirical findings of Anand and Kanbur, 1993; Fields, 1995; and Fields and Jakubsen, 1993). Instead we predict that a Kuznets curve should be observed when a society democratizes due to social pressure. Alternative development paths, the "autocratic disaster" and the "East Asian miracle", do not feature Kuznets curves. In an autocratic disaster inequality is high, but there is no democratization or redistribution because the masses are badly organized. The poverty of the masses slows down accumulation and leads the economy to stagnate at a low level of output. In an East Asian miracle initial inequality is low, so the economy accumulates rapidly and converges to a high level of output, and because the gains from growth are more equally shared, social pressure does not emerge until much later, and thus political reform is considerably delayed.

Our paper belongs to the growing literature on political economy and growth. However, we are aware of no other paper which shares our two key points: franchise extension as a commitment device, and the Kuznets curve as a result of political reform caused by social conflict. Among the important contributions related to our work are Roemer (1985) who provides the first economic model of revolution; Grossman (1991;1993;1995), who models predation by the unprivileged against the rich; and Ades (1995) and Ades and Verdier (1993), who investigate a model where there is concentration of power in the hands of an elite. Our paper is also closely related to Bénabou (1996), Galor and Zeira (1993), Perotti (1993) and Banerjee and Newman (1993) who model investment opportunities as indivisible and thus show that distribution of income matters for growth and development. In fact, our model in Section 3 builds on Galor and Zeira (1993). Finally, our contribution shares a common theme with North and Weingast (1989) who also argue that political reform

can be a method of commitment, but in the context of the introduction of the English Parliament in the seventeenth century.

The plan of the paper is as follows. In Section 2, we develop a model where political power is concentrated in the hands of an elite and the masses can initiate a revolution to contest this power. We show that the elite can prevent a revolution either by redistributing, or by extending the franchise. We characterize the conditions under which current and promised future redistribution are not sufficient to stave off a revolution, and thus a firm commitment to future redistribution, the extension of the franchise, is necessary. In Section 3, we simplify this model in a number of dimensions and add capital accumulation. We show that an increase in inequality can make the revolution a threat, and analyze the dynamics of inequality and output in this model. We outline how a Kuznets curve, an autocratic disaster, an East Asian miracle and a revolution may arise along the equilibrium path. In Section 4, we return to the historical evidence, and justify many of the assumptions we make in our analysis. We also argue in this section that for countries (other than the U.S.) in which a Kuznets curve is detected the peak coincides with political reform triggered by social unrest. Section 5 briefly discusses some extensions. Section 6 concludes.

2   A Model of Democratization

2.1   The Environment

We consider an infinite horizon economy with a continuum 1 of agents. A proportion λ of these agents are "poor", while the remaining $1 - \lambda$ form a rich "elite". Throughout the paper superscript p will denote poor agent and r will denote rich agent (or member of the elite). We will treat all poor agents as identical, and all members of the elite will also be identical. Initially, political power is concentrated in the hands of the elite, but $\lambda > \frac{1}{2}$ so that if there is full democracy, the median voter will be a poor agent.

There is a unique consumption good y with price normalized to unity, and a unique asset, h (which should be thought as a combination of human and physical capital). We begin our analysis of the economy at time $t = 0$ where each poor agent has human capital h_0^p and each member of the elite has $h_0^r > h_0^p \geq 1$. In this section these stocks will be exogenous (so we drop time subscripts). Accumulation is investigated in Section 3.

There are two methods of producing the final good. Both techniques are linear in capital. The first is a market technology, $Y_t^m = A H_t^m$ where H_t^m is the amount of human capital devoted to market production. The second is an "informal", or home production

3

technology: $Y_t^h = BH_t^h$, where H_t^h is the amount of human capital used in home production. Naturally, we have $H_t^h + H_t^m = H \equiv \int h^i di$. We assume that $A > B$, so the market sector is always more productive. The only role of home production in our analysis is to ensure an equilibrium tax rate less than 100%, because while taxes can be imposed on the market sector, home production is not taxable.

All agents have identical preferences represented by a linear indirect utility function over net income, and a discount factor $\beta \in (0,1)$. Post-tax income is given by, $\hat{y}_t^i \equiv (1 - \tau_t)Ah^i + T_t$, for $i = p, r$, where τ_t is the tax rate on income, and $T_t \geq 0$ is the transfer that the agent receives from the state. We assume throughout that taxes and transfers cannot be person specific, hence T_t and τ_t are not indexed by i. The government budget constraint therefore implies $T_t = \tau_t AH^m$, where we have used the fact that only human capital used in market production, H^m, can be taxed.[3]

The "masses" (λ poor agents), though initially excluded from the political process, are endowed with a *revolution technology*. Since they form the majority, they can overthrow the existing government and take over the means of production, i.e. the capital stock in any period $t \geq 0$. We assume that if a revolution is attempted, it always succeeds, but the poor only retain a fraction μ_t of the output (the rest gets destroyed or is partially kept by the previous elite, though in the analysis, we assume, for simplicity, that the elite receive nothing after a revolution). In particular, if there is a revolution at time t, then each poor agent receives a per period return of $\mu_t AH/\lambda$ in all future periods. This is because the total wealth in the economy is AH, and they capture a fraction of μ_t of this and share it between λ agents. A low value of μ implies an ineffective revolution technology (e.g. a society in which the poor are unorganized). We assume that μ is stochastic and changes between two values: μ^h and $\mu^l = 0$. In particular, we have $\Pr(\mu_t = \mu^h) = q$ irrespective of whether $\mu_{t-1} = \mu^h$ or μ^l. The fact that μ fluctuates captures the notion that some periods may be more conducive to social unrest, and also that a promise to redistribute today may not materialize due to changes in circumstances tomorrow.

Finally, in each period the elite have to decide whether or not to extend the franchise. If it is extended, the economy becomes a democracy, and now the median voter, a poor agent sets the tax rate. We assume that if voting rights are extended, they cannot be rescinded. So the economy always remains a democracy.[4]

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[3]We think of time $t < 0$ as governed by a different model, for example with less inequality, so that there was no threat of revolution and no need to redistribute by the elite, thus $T_t = \tau_t = 0$ for all $t < 0$.

[4]This is not to deny that in many countries coups happen. It is nevertheless true that once voting rights are extended and political parties are formed, it is relatively costly for any group to exclude the rest from the political process. We discuss some reasons for this in Section 5

The timing of events within a period can be summarized as follows.

1. the state μ is revealed.

2. the elite decide whether or not to extend the franchise. If they decide not to extend the franchise they also set the tax rate.

3. the poor decide whether or not to initiate a revolution. If there is a revolution they share the remaining output. If there is no revolution and the franchise has been extended, the tax rate is set by the median voter (a poor agent).

4. the capital stock is allocated between market and home production and incomes are realized.

2.2 Analysis

The analysis can be simplified by exploiting two features of the model. First, the capital allocation decision takes a simple form. If $\tau_t > \hat{\tau} \equiv \frac{A-B}{A}$, then all agents allocate their capital to home use, thus $H_t^m = 0$. If on the other hand $\tau_t \leq \hat{\tau}$, then $H_t^m = H_t$ is a best-response. It is clear then that no voter would ever choose $\tau_t > \hat{\tau}$, and we can restrict attention to $\tau_t \leq \hat{\tau}$ and $H_t^m = H_t$, which reduces the number of actions to be considered. Second, all members of the elite have identical preferences, so we can treat them as one player. Also, all poor agents have the same preferences, and when it comes to whether or not to participate in a revolution, there is no "free-rider problem", because if an agent does not take part in the revolution, he can be excluded from the resulting redistribution. So, we can treat all poor agents as one player. Therefore, this economy can be represented as a dynamic game between two players, the elite and the masses.

In the text, we characterize the Markov Perfect Equilibria of this game, in which strategies only depend on the current state of the world and not explicitly on time. Even though the focus on Markovian equilibria is natural in this setting, for completeness, we discuss non-Markovian equilibria in the Appendix, and show that they do not change our general results. The state of the system consists of the current opportunity for revolution, represented by either μ^l or μ^h, and the political state (democracy or elite control). More formally, let $\sigma^r(\mu, P)$ be the actions taken by the elite when the state is $\mu = \mu^h$ or μ^l, and $P = E$ (elite in power) or D (democracy). This consists of a decision to extend the franchise ϕ when $P = E$, and a tax rate τ^r when $\phi = 0$ (i.e. when franchise is not extended). Clearly, if $\phi = 0$, P remains at E, and if $\phi = 1$, P switches to D forever. Similarly, $\sigma^p(\mu, P|\phi, \tau^r)$ are the actions of the poor which consist of a decision to initiate a revolution, ρ ($\rho = 1$ representing a revolution), and possibly a tax rate τ^p when the political state is $P = D$.

5

These actions are conditioned on the current actions of the elite who move before the poor agents according to the timing of events above. Then, a (Markov Perfect) equilibrium is a strategy combination, $\{\sigma^p(\mu, P), \sigma^r(\mu, P|\phi, \tau^r)\}$ such that σ^p and σ^r are best-responses to each other for all μ and P.

We can characterize the Markov Perfect Equilibria of this game by writing the appropriate Bellman equations. Let us start by defining $V^p(R)$ as the return to poor agents if there is a revolution (starting in state $\mu = \mu^h$ since in the other state a revolution will never occur). Clearly, $V^p(R) = \frac{\mu^h A H}{\lambda(1-\beta)}$ which is the per-period return from revolution for the infinite future discounted to the present (note that only the value of μ^h at the time of the revolution matters, hence the per-period return is constant over time). Also, since the rich lose everything, we have $V^r(R) = 0$.

Next, suppose there is a democracy. In this case, the median voter is a poor agent (since $\lambda > 1/2$) and wants as much redistribution as possible, because redistribution has no allocative cost as long as $\tau \leq \hat{\tau}$. Therefore, the equilibrium tax rate will be $\tau_t = \hat{\tau} \equiv \frac{A-B}{A}$, and from the assumption that the budget is balanced, $T_t = (A - B)H$. We can then write the return to poor and rich agents as: $V^p(D) = \frac{Bh^p + (A-B)H}{(1-\beta)}$ and $V^r(D) = \frac{Bh^r + (A-B)H}{(1-\beta)}$.

Now, consider the state (μ^l, E). The elite are in power and there is no threat of revolution, so in any Markov Perfect Equilibrium, $\phi = 0$ and $\tau^r = 0$. Therefore, the values of poor and rich agents, $j = p$ or r, are given by:

$$V^j(\mu^l, E) = Ah^j + \beta \left[(1-q)V^j(\mu^l, E) + qV^j(\mu^h, E) \right]. \tag{1}$$

Finally, consider the state (μ^h, E). Suppose that the elite play $\phi = 0$ and $\tau^r = 0$. Then, we would have $\tilde{V}^p(\mu^h, E) = \frac{Ah^p}{(1-\beta)}$. The revolution constraint is equivalent to: $V^p(R) > \tilde{V}^p(\mu^h, E)$. In words, without any redistribution and franchise extension, the masses prefer to initiate a revolution when $\mu = \mu^h$. To make the analysis interesting, we assume that this constraint binds. That is:

Assumption 1 $\quad \frac{h^r}{h^p} > \frac{\lambda(1-\mu^h)}{\mu^h(1-\lambda)}$.

Revolution is more attractive for the masses when inequality, h^r/h^p, is high so that they have more to gain by taking control of the means of production, and when λ is low, so that there is sufficient wealth among the rich (recall total wealth of the rich is $(1 - \lambda)h^r$). Assumption 1 ensures inequality is sufficiently high (and λ low) that the poor prefer revolution to the status quo with no redistribution. Since the revolution is the worst outcome for the elite, they will attempt to prevent it. They can do this in two different

ways. First, they can extend the franchise, $\phi = 1$. Then, the poor receive their return under democracy, $V^p(D)$. Second, the elite can choose to maintain political power, $\phi = 0$, but redistribute through taxation: in this case, the poor obtain $V^p(\mu^h, E, \tau^r)$ where τ^r is the tax rate chosen by the rich. With either action by the elite, the poor may still prefer a revolution, thus:

$$V^p(\mu^h, E) = \max \left\{ V^p(R); \ \phi V^p(D) + (1 - \phi)V^p(\mu^h, E, \tau^r) \right\}.$$

Next, we have:

$$V^p(\mu^h, E, \tau^r) = (1 - \tau^r)Ah^p + \tau^r AH + \beta \left[qV^p(\mu^h, E, \tau^r) + (1 - q)V^p(\mu^l, E) \right] \quad (2)$$

In words, the rich redistribute to the poor, taxing all income at the rate τ^r. The poor therefore receive net income $(1 - \tau^r)Ah^p$ from their own capital and transfer $T = \tau^r AH$. If next period we are still in state $\mu = \mu^h$, then redistribution continues. However, if in the next period the economy switches to $\mu = \mu^l$, redistribution stops and the poor receive $V^p(\mu^l, E)$. This captures the discussion in the introduction that the elite cannot commit to future redistribution, unless the future also poses an effective revolution threat. Also note that $\tau^r \leq \hat{\tau}$, that is the elite cannot tax themselves at a rate higher than $\hat{\tau} \equiv \frac{A-B}{A}$; if $\tau > \hat{\tau}$, then each (rich) agent would privately prefer to put all their assets to the home sector, reducing aggregate tax revenues to zero.

Before proceeding further, it simplifies the exposition to restrict attention to the area of the parameter space where democratization prevents a revolution, that is $V^p(D) > V^p(R)$. Thus, we assume:

Assumption 2 $Bh^p + (A - B)H > \frac{\mu^h AH}{\lambda}.$

Next, it is useful to calculate the maximum utility that can be given to the poor without extending the franchise, $\hat{V}^p(\mu^h, E|q)$, as a function of the parameter q. This maximum utility is clearly achieved by setting $\tau^r = \hat{\tau}$ in (2). Therefore, combining (1) and (2), we obtain:

$$\hat{V}^p(\mu^h, E|q) = V^p(\mu^h, E, \hat{\tau}) = \frac{Bh^p + (A - B)H - \beta(1 - q)(A - B)(H - h^p)}{(1 - \beta)} \quad (3)$$

Now, if $\hat{V}^p(\mu^h, E|q) < V^p(R)$, then the maximum transfer that can be made when $\mu = \mu^h$ is not sufficient to ensure that the poor receive enough to prevent a revolution. It is clear that $\hat{V}^p(\mu^h, E|q = 1) = V^p(D) > V^p(R)$ by Assumption 2, and $\hat{V}^p(\mu^h, E|q = 0) = \frac{Ah^p}{(1-\beta)} < V^p(R)$ by Assumption 1. Moreover, $\hat{V}^p(\mu^h, E|q)$ is monotonically and continuously

7

increasing in q. Therefore, there exists a unique $q^* \in (0,1)$ such that $\hat{V}^p(\mu^h, E|q^*) = V^p(R)$. Finally, note that $V^r(\mu^h, E, \tau^r)$ is decreasing in τ^r, and for all τ^r, it is greater than $V^r(D)$. This is because when there is a democracy, $\tau = \hat{\tau}$ in all periods, whereas with the power in the hand of the elites, $\tau \in (0, \hat{\tau}]$ whenever $\mu = \mu^h$, but $\tau = 0$ when $\mu = \mu^l$. From this discussion the following characterization of equilibrium follows immediately:[5]

Proposition 1 Suppose Assumptions 1 and 2 hold. Then, for all $q \neq q^*$, there exists a unique Markov Perfect Equilibrium such that:

    1. If $q < q^*$, then $\sigma^r(\mu^l, E) = (\phi = 0, \tau = 0), \sigma^r(\mu^h, E) = (\phi = 1, .)$. $\sigma^p(\mu^h, E|\phi = 0, \tau) = (\rho = 1)$, $\sigma^p(\mu^h, E|\phi = 1, .) = (\rho = 0, \tau = \hat{\tau})$ and $\sigma^p(\mu^h, D) = (\tau = \hat{\tau})$.

    2. If $q > q^*$, then $\sigma^r(\mu^l, E) = (\phi = 0, \tau = 0), \sigma^r(\mu^h, E) = (\phi = 0, \bar{\tau}^r)$ where $\bar{\tau}^r \in (0, \hat{\tau})$ is defined by $V^p(R) = V^p(\mu^h, E, \bar{\tau}^r)$. Also $\sigma^p(\mu^h, E|\phi = 0, \tau) = (\rho = 1)$ for all $\tau < \bar{\tau}^r$, $\sigma^p(\mu^h, E|\phi = 0, \tau) = (\rho = 0)$ for all $\tau \geq \bar{\tau}^r$, and off the equilibrium path, $\sigma^p(\mu^h, E|\phi = 1, .) = (\rho = 0, \tau = \hat{\tau})$ and $\sigma^p(\mu^h, D) = (\tau = \hat{\tau})$.

The results of Proposition 1 can be expressed in a simple way: recall that the game starts with the elite in power. Now, if $q < q^*$, then the rich set a zero tax rate when $\mu = \mu^l$, and extend the franchise when the state switches to $\mu = \mu^h$. The poor play the optimal strategy of initiating a revolution if the state is $\mu = \mu^h$ and the franchise has not been extended. And if the franchise is extended, in the new democracy the median voter is a poor agent and sets the tax rate $\tau = \hat{\tau}$. In contrast, when $q > q^*$, the rich can prevent the revolution by redistributing. So in the state $\mu = \mu^l$, once again they set $\tau = 0$ and in the state $\mu = \mu^h$, they set a tax rate, $\bar{\tau}^r$, just enough to discourage revolution. This strategy combination is the unique (Markov Perfect) equilibrium of the game.

There are three important conclusions to be drawn from this analysis:

First, even though the elite face a lower future tax burden with redistribution than under democracy, they may prefer to extend the franchise. This is because when $q < q^*$, redistribution is not sufficient to prevent a revolution. With q low, the revolution threat is transitory, thus the poor realize that they will only receive transfers for a short while and then transfers will cease. Redistribution when $\mu = \mu^h$ can therefore be viewed as a noncredible promise of future redistribution by the elite. Unconvinced by this promise,

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[5]When $q \neq q^*$, the equilibrium is no longer unique. In particular, there exists an equilibrium which takes the form in part 1 of the Proposition, and one which is similar to part 2. Also, in the Appendix, we allow for non-Markovian strategies and find that even when $q < q^*$, there exist subgame perfect equilibria with redistribution and no democratization, but there exists a cutoff $q^{**} < q^*$ such that when $q < q^{**}$, the unique equilibrium has franchise extension in the state (μ^h, E).

the masses would attempt a revolution. The revolution is only prevented by franchise extension.

Second, perhaps paradoxically, a high value of q makes franchise extension less likely. A high q corresponds to an economy in which the masses are well organized, so they frequently pose a revolutionary threat.[6] A naive intuition may have been that in this case, democratization is more likely. However, this is not the case because with a frequent revolutionary threat, future redistributions become *credible*. This result may explain why Germany, which had the most developed socialist party, instituted the welfare state in the nineteenth century without franchise extension, while Britain and France extended the franchise. We return to this issue in Section 4.

Finally, it is straightforward to see by comparing $V^p(R)$ and $V^p(\mu^h, E|q^*)$ that q^* is increasing in the extent of inequality, h^r/h^p. This implies that higher inequality enlarges the area of the parameter space where democratization occurs. The role of inequality in franchise extension will be discussed in more detail in the next section.

3 A Model of Growth and Inequality Dynamics

3.1 The Environment

The previous section established why the elite may be forced to extend the franchise, even when they can use taxation and redistribution to reduce inequality. We now alter the focus of the analysis to explore the implications of such political reform on growth and inequality. To simplify the analysis, we consider a non-overlapping generations model with bequests. The same continuum of agents as in the last section now live for only one period and each beget a single offspring. Technology is identical to that in Section 2, but human capital accumulates over time. This allows us to study how political transition interacts with the dynamics of inequality.

We assume that all agents have identical preferences defined over their own consumption and "educational bequests" given by:

$$
\begin{aligned}
u^i(c_t^i, e_{t+1}^i) &= (c_t^i)^{1-\gamma} \left(e_{t+1}^i\right)^{\gamma} && if \ e_{t+1}^i > 1 \\
u^i(c_t^i, e_{t+1}^i) &= (c_t^i)^{1-\gamma} && if \ e_{t+1}^i \leq 1
\end{aligned} \tag{4}
$$

for $i = r, p$ and $\gamma \in (0, 1)$. Here c_t^i is the consumption of a member of group i alive in period t, and e_{t+1}^i is the investment in the offspring's education. These preferences imply a

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[6]Alternatively, we could have assumed $\mu^l > 0$ so that even in this state with the elite in power, we would have $\tau^r > 0$. In this case, a high value of μ^l would also lead to the same result.

9

constant savings rate equal to γ, and an indirect utility function which is linear in income as in the previous section. Both the consumption and bequest decisions are made at the end of the individual's life. The form of the utility function implies that there is a minimum amount of bequest, $e_{t+1}^i = 1$, and when the agent cannot afford this amount, he will leave nothing to his offspring. This non-convexity captures the feature that very poor agents will not be able to accumulate assets (see Galor and Zeira, 1993).

The offspring's human capital is given by:

$$h_{t+1}^i = \max\left\{1; \ Z e_{t+1}^i{}^\beta\right\} \tag{5}$$

where $Z > 1$, and also $\beta < 1$ which will guarantee that accumulation does not continue indefinitely. The presence of $\max\{1; .\}$ in (5) implies that even in the absence of any investment, there is a minimum amount of human capital that each agent would have.

The timing of events within a period now is:

1. education bequests are received.

2. the elite decide whether or not to extend the franchise.

3. the poor decide whether to initiate a revolution. If there is a revolution they share the remaining output of the economy. Otherwise, the political system decides the tax rate (i.e. a poor median voter if there is democracy, and a rich agent if not).

4. the capital stock is allocated between market and home production, and consumption and bequest decisions are made.

Although the timing of events is quite similar to Section 2, there is a major difference. Now, there is no possibility of choosing redistribution to prevent a revolution, because taxes are set after the revolution decision within the period. This implies that we are focusing attention in the case of $q < q^*$ in terms of the analysis of the previous section.

3.2   Analysis

As noted above, the preferences in (4) imply a constant savings rate: $e_{t+1}^i = \gamma \hat{y}_t^i$, if $\gamma \hat{y}_t^i > 1$ and $e_{t+1}^i = 0$, if, $\gamma \hat{y}_t^i \leq 1$. So if an agent can afford it, he will invest a fixed proportion of his post tax income in the education of his offspring, but when his income is below a minimum, he will consume all of it. At this stage we make the following assumption:

Assumption 3 $\gamma A < 1$ and $(\gamma B)^\beta Z > 1$.

The first part implies that in the case where there is no taxation ($\tau_t = T_t = 0$), an agent who has the minimum level of human capital, $h_t^i = 1$, will leave no education to

10

his offspring, thus $h_{t+1}^i = 1$ also. Therefore, it is possible for some households not to accumulate while others do so. The second part of the assumption guarantees that when accumulation of human capital takes place, and even if the rate of return on human capital is $B < A$, a steady state level of human capital greater than 1 can be reached. This second part will not only enable accumulation by the rich in the absence of taxation, but also ensure that taxation will never be severe enough to stop accumulation.

In all of our analysis, we only consider initial conditions such that:

$$h_{SS}^r > h_0^r > (\gamma A)^{-1},$$

where h_{SS}^r is the steady state value of the rich agents' human capital. The first part of the inequality ensures that we start with less than steady state human capital, thus there will be *growth* (rather than decumulation of capital). The second inequality ensures that rich agents are beyond the point of non-convexity, and are able to leave positive educational bequests to their offspring. Once again, we think of the periods $t < 0$ as governed by a different technology so that no one accumulates and inequality is stable.

3.3   Equilibrium Dynamics without the Threat of Revolution

We first analyze accumulation and inequality in the absence of the threat of revolution.

Case 1: Autocracy and Only the Rich Accumulate Since we have the elite in control of the political system, $\tau_t = 0$. Suppose also that $h_0^p < (\gamma A)^{-1}$, then Assumption 3 implies $h_t^p = 1 \ \forall t > 0$, so that the poor are unable to accumulate. The rich on the other hand will accumulate and the human capital dynamics for this group are given by: $h_{t+1}^r = Z \left(e_{t+1}^r\right)^\beta = Z \left(\gamma A h_t^r\right)^\beta$. This dynamic equation has a unique steady state:

$$h_{SS} = \left((\gamma A)^\beta Z\right)^{\frac{1}{1-\beta}}. \tag{6}$$

Since $(\gamma B)^\beta Z > 1$ by Assumption 3, and $A > B$, we have $h_{SS} > 1$.

Inequality in this economy can be measured by the income ratio of the rich to the poor: $y_t^r / y_t^p = A h_t^r / A = h_t^r$. On the way to the steady state h_t^r is increasing, so inequality is increasing too. Finally, the steady state level of aggregate income in this economy is: $Y_{SS}^1 = A \left[\lambda + (1 - \lambda) \left((\gamma A)^\beta Z\right)^{\frac{1}{1-\beta}}\right]$.

Case 2: Autocracy and All Agents Accumulate Suppose $h_0^r > h_0^p > (\gamma A)^{-1}$, and also still $\tau_t = 0$. Then we have: $h_{t+1}^j = Z(\gamma A h_t^j)^\beta$ for $j = r$ and p. Since $h_0^p > (\gamma A)^{-1}$, the poor will also be able to accumulate. Thus $h_t^p > 1 \ \forall t$. This implies that both groups will converge to the same steady state, h_{SS}, given by (6). Since the poor start with less human

11

capital and converge to the same level, along this equilibrium path, inequality is decreasing. The steady state level of aggregate income is given by: $Y_{SS}^2 = A\left((\gamma A)^\beta Z\right)^{\frac{1}{1-\beta}} > Y_{SS}^1$. Therefore, this economy converges to a more equal distribution of income and also to a higher level of aggregate output than the previous case. The reason for this is that in Case 1, a fraction of the agents were unable to accumulate, causing a poverty trap.

Case 3: Democracy We now consider the dynamics under democracy. We know that in this case, the poor median voter will set the maximum tax rate: $\tau_t = \hat{\tau} \equiv \frac{A-B}{A}$. Accumulation dynamics are then determined by:

$$h_{t+1}^j = \max\left\{1, Z\left(\gamma\left[Bh_t^j + (A-B)H_t\right]\right)^\beta\right\} \tag{7}$$

for $j = r$ and p. The second part of Assumption 3, $(\gamma B)^\beta Z > 1$, ensures $h_{t+1}^r > 1$ if $h_t^r > 1$. Therefore, taxation will not stop accumulation by the rich. This does not however guarantee that the poor will be able to accumulate. If $h_0^p > (\gamma A)^{-1}$, so that in the absence of redistributive taxation the poor would be able to accumulate, they will also be able to accumulate when they receive transfers. Now consider the more involved case where $h_0^p < (\gamma A)^{-1}$ so that the poor may not accumulate. Suppose $h^p = 1$, then equation (7) implies that the capital of the rich converges to the steady-state level:

$$h_{SS}^D = \gamma Z\left[(A(1-\lambda) + \lambda B)h_{SS}^D + (A-B)\lambda\right]^\beta.$$

It is straightforward to see that h_{SS}^D is uniquely defined and $h_{SS}^D < h_{SS}$. Let also Y_{SS}^D denote the steady-state level of output when $h^p = 1$; thus $Y_{SS}^D = A\left[\lambda + (1-\lambda)h_{SS}^D\right]$ which is strictly less than Y_{SS}^2 and Y_{SS}^1. Now consider:

Condition 1 $\gamma\left[B + (A-B)\left((1-\lambda)h_{SS}^D + \lambda\right)\right] > 1$

This condition states that when $h_t^p = 1$ and $h_t^r = h_{SS}^D$, the redistribution from taxation will be sufficient to enable the poor to accumulate. To see this note that the term in square brackets is the post tax income of a poor household with $h_0^p = 1$: he receives an after tax return B on his human capital, and the second term is the total per-person transfer in this economy when $h_t^p = 1$ and $h_t^r = h_{SS}^D$. Condition 1 is necessary and sufficient for accumulation by the poor. If it holds, at some point the rich will have a high enough level of income (human capital) so that redistributive taxation will enable the poor to grow richer. When it is violated, there exists no $h_t^r < h_{SS}^D$ that will generate enough tax revenue to enable accumulation by the poor.

12

When Condition 1 holds, the economy converges to Y_{SS}^2 with both the poor and the rich accumulating to h_{SS}, so inequality will also decrease as in the previous case. On the other hand, when the poor do not accumulate, inequality, given by $\frac{\hat{y}_t^r}{\hat{y}_t^p} = \frac{(A-B)\left((1-\lambda)h_t^r+\lambda\right)+Bh_t^r}{(A-B)\left((1-\lambda)h_t^r+\lambda\right)+B}$, will increase despite the fact that there are also increased transfers to the poor. Also, when Condition 1 holds, it is also possible for the poor to start accumulating from period $t = 0$, in which case inequality will fall monotonically. The necessary and sufficient condition for this is:

Condition 2 $\gamma\left[Bh_0^p + (A-B)\left((1-\lambda)h_0^r + \lambda h_0^p\right)\right] > 1,$

which ensures that at time $t = 0$, the after-tax income of the poor times the savings rate (γ) is greater than 1, thus $\gamma\hat{y}_0^p > 1$. It is useful to notice that whenever $h_0^p \leq 1$, Condition 1 is less restrictive than Condition 2 because $h_0^r < h_{SS}^D$.

We can now summarize equilibrium dynamics without the threat of revolution. Let h_{SS} be defined as in (6):

Proposition 2 Suppose that Assumption 3 holds, $h_0^r \in ((\gamma A)^{-1}, h_{SS})$ and the political system is controlled by the elite. Then, we have $\tau_t = 0$ and:

    1. If $h_0^p \leq (\gamma A)^{-1}$, then $h_t^p = 1\ \forall t > 0$, h_t^r monotonically converges to h_{SS}, aggregate output converges to Y_{SS}^1 and inequality increases monotonically.

    2. If $h_0^p > (\gamma A)^{-1}$, then both h_t^p and h_t^r monotonically converge to h_{SS}, aggregate output converges to $Y_{SS}^2 > Y_{SS}^1$ and inequality decreases monotonically.

Proposition 3 Suppose that Assumption 3 holds, $h_0^r \in ((\gamma A)^{-1}, h_{SS})$, and the political system is democratic. Then we have $\tau_t = \hat{\tau}$ and;

    1. If $h_0^p > (\gamma A)^{-1}$, then both h_t^p and h_t^r monotonically converge to h_{SS}, aggregate output converges to $Y_{SS}^2 > Y_{SS}^1$ and inequality decreases monotonically.

    2. If $h_0^p \leq (\gamma A)^{-1}$ and Condition 2 holds, then inequality is monotonically decreasing, and h_t^p and h_t^r converge to h_{SS}, aggregate output converges to Y_{SS}^2.

    3. If $h_0^p \leq (\gamma A)^{-1}$ and Condition 1 fails to hold, then inequality increases monotonically, $h_t^p = 1\ \forall t > 0$, and h_t^r converges to h_{SS}^D. Output converges to $Y_{SS}^D < Y_{SS}^2$.

    4. If $h_0^p \leq (\gamma A)^{-1}$ and Condition 1 holds and Condition 2 fails to hold, then there exists $\hat{t}$, such that $h_t^p = 1\ \forall t \in (0, \hat{t})$, and h_t^p is growing $\forall t \geq \hat{t}$. Inequality is increasing until $\hat{t}$ and decreases thereafter. Aggregate output converges to Y_{SS}^2.

There are a number of features to note. First, in the absence of redistributive taxation, there is no Kuznets curve: inequality is always increasing or decreasing. A Kuznets curve

is however possible with a democracy (Proposition 3, Part 4): when the rich are not sufficiently wealthy, the transfers from them to the poor will not ensure accumulation, and inequality will increase. But when the rich become sufficiently wealthy, transfers reach a crucial threshold, the poor start accumulating, and inequality falls. Thus in this model, redistributive taxation is key for the Kuznets curve. However, this configuration of the Kuznets curve is not totally compelling; as noted earlier and discussed in more detail in Section 4, Western societies did not start out as democratic and were not so when inequality was increasing, and there was no redistributive taxation. We will see that the Kuznets curve will arise for a larger set of parameter values when we add the possibility of revolution and franchise extension to an economy with the elite in power, and this we believe is a much more plausible explanation for the Kuznets curve.

Second, inequality and especially the poverty of the masses are harmful to development. When the poor have $h_0^p > (\gamma A)^{-1}$, the economy converges to the higher steady state Y_{SS}^2, whereas otherwise it may get stuck in the lower steady state with per capita income Y_{SS}^1. This relation between inequality and prosperity applies both to a democracy and an autocracy. This result is a direct consequence of the nonconvexity in the accumulation technology as in Galor and Zeira (1993).

Finally, in this model democracy is good for economic performance if it enables accumulation by the poor, but detrimental otherwise. In the absence of democracy, $h_0^p < (\gamma A)^{-1}$ condemns the economy to the lower level of steady state output Y_{SS}^1, but with democracy, the conditions for "stagnation" are much more stringent. On the other hand, if there is democracy but the poor cannot accumulate, the economy converges to Y_{SS}^D which is even less than Y_{SS}^1. So the impact of democracy on performance is ambiguous. With some of the costs as emphasized by Alesina and Rodrik (1994) and Persson and Tabellini (1994), democracy would have an ambiguous effect even when it enables the poor to accumulate. Therefore, the empirical results that show no robust correlation between democracy and growth should not be too surprising.

3.4   The Threat of Revolution

We will now analyze an economy which starts with the elite in power. If the revolution constraint never becomes binding (e.g. if μ is very small), then the equilibrium dynamics of Proposition 2 will apply. If on the other hand revolution becomes a real threat, the rich have to redistribute to the poor in order to prevent a revolution. However, given the timing we have assumed, a promise to redistribute by the elite is not credible, thus would

not prevent revolution. The only way to make a credible commitment is to transfer political power to the poor, i.e. *to extend the franchise.* Therefore, when the revolution constraint becomes binding, the franchise is extended and the dynamics of Proposition 2 are replaced with those of Proposition 3 where the median voter is a poor agent.

The general revolution constraint when the rich are in power is the same as in the previous section: $Ah_t^p \geq AH_t/\lambda$. But now μ is constant and h_0^r/h_0^p is changing over time. Therefore, the revolution constraint becomes:

$$\frac{h_t^r}{h_t^p} \leq \frac{\lambda(1-\mu)}{\mu(1-\lambda)}. \tag{8}$$

When (8) holds, there will be no revolution at time t. Two points to note about this revolution constraint are: first, the higher is μ, the tighter is the revolution constraint, which is fairly intuitive. Second, the higher is λ, the less tight is (8); this is because the benefit of the revolution is to takeover the wealth of the rich $((1-\lambda)h_t^r)$ and when there are fewer of them with the same income level (i.e. h_t^r is given), the return from revolution falls. Therefore, the threat of revolution is more serious when a society has more inequality (a larger gap between h^r and h^p) and is less segmented (λ relatively low).

Case 1: The Threat of Revolution When Only The Rich Accumulate In this case, the economy converges to Y_{SS}^1 with increasing inequality on the way with the poor stuck at $h_t^p = 1$. If (8) is not binding at the point of steady state (which has maximal inequality), it will never bind. Thus we have:

Condition 3 $h_{SS} > \frac{\lambda(1-\mu)}{\mu(1-\lambda)}$.

If Condition 3 holds, the threat of revolution will become effective at some point as the rich accumulate. If it fails to hold, then we can ignore the revolution constraint.

Case 2: The Threat of Revolution When All Agents Accumulate In this case, inequality is decreasing, so it is highest at time $t = 0$. Then we have:

Condition 4 $\frac{h_0^r}{h_0^p} < \frac{\lambda(1-\mu)}{\mu(1-\lambda)}$.

If Condition 4 is satisfied, then there is no revolutionary threat at time $t = 0$ and since inequality is lower after this point, there is never any threat of revolution. The configuration in which both Conditions 3 and 4 hold is of interest. In this case, if the poor are excluded from the accumulation process, at some point they will want to redistribute resources to themselves by force. If in contrast they are also accumulating along the development path, they will not see revolution as a worthwhile activity.

15

As discussed above, when the revolution constraint binds, the elite have no choice but to extend the franchise. However, we have to ensure that the extension of the franchise generates sufficient redistribution to stave off a revolution. The necessary condition for this is related to Assumption 2 in Section 2. $(A - B)\left((1 - \lambda)h_t^r + \lambda h_t^p\right) + B h_t^p \geq A\mu\left[(1 - \lambda)h_t^r + \lambda h_t^p\right]/\lambda$. The LHS is what a poor agent gets after redistributive taxation, and the RHS is what he gets with revolution. We are particularly interested in whether this condition holds at the point the revolution constraint binds and the poor are not accumulating. Equation (8) implies that $h_t^r = \frac{\lambda(1-\mu)}{\mu(1-\lambda)}$ at this point. So to ensure that in this case franchise extension prevents a revolution, we need to impose:

Condition 5 $A\left(\lambda - \mu\right) \geq B(1 - \mu)$.

3.5   Results: Implications For Growth and Democratization

In this subsection, we combine the analysis of the previous two subsections and outline some possible paths of development. Throughout we assume that the elite start in power and Assumption 3 holds.

The Kuznets Curve The following result is immediate from our previous analysis:

Result 1 Suppose the economy starts in Case 1, and Conditions 1, 3 and 5 hold. Then the at $t = 0$ the rich accumulate and the poor do not. At $\hat{t}$ inequality exceeds the critical threshold $\frac{\lambda(1-\mu)}{\mu(1-\lambda)}$, the revolution constraint binds and the elite extend the franchise. From this point on the poor also start to accumulate, inequality falls and aggregate output converges to Y_{SS}^2.

In our view, this sequence of events corresponds to the experience of Britain, France, Sweden and Germany, where, as discussed in more detail in the next section, after a period of increased inequality accompanied by wars and depressions, the threat of revolution intensified. This forced the extension of the franchise and increased redistribution. As a result, inequality declined. This case is the main focus of our analysis. In the rest of this section, we outline alternative paths of development to contrast with the Kuznets curve.

Autocratic Disaster

Result 2 Suppose the economy starts in Case 1, and Condition 3 does not hold. Then, the rich start to accumulate at time $t = 0$ and the poor do not. The revolution constraint never binds, the economy remains an autocracy with high inequality and converges to aggregate output Y_{SS}^1.

This is the path of an economy where initial inequality is high, but nonetheless, the masses do not pose a revolutionary threat. This might be because the absence of a well-developed civil society or other factors imply that μ is small (that is, the poor will have a hard time organizing, therefore a revolution would be very costly for them), or because λ is high so that revolution is not as beneficial at given h^r/h^p. If μ were large so that revolution became a real threat, this economy could democratize, redistribute to the poor, and reach a higher level of income. Thus, contrary to conventional wisdom, political and social instability may sometimes be good for growth. In particular, whether a good "revolution technology" hinders or enhances growth depends on which case the economy is in.

East Asian Miracle

Result 3 Suppose the economy starts in Case 2 and Condition 4 holds. Then, all agents accumulate starting at time $t = 0$, inequality declines and the revolution constraint never binds. Aggregate output converges to Y_{SS}^2.

In this case, along the development path the poor segments of the society are sharing in the benefits of rising average per capita income, and therefore do not find it worthwhile to create social unrest. This case reminds us of Taiwan and South Korea. In the early post war period, both of these countries were in a situation very similar to that of the Philippines except that inequality was much higher in the latter (as in the case of the autocratic disaster).[7] In all three, political power was concentrated in the hands of an elite, not unlike nineteenth century Britain. In Britain per capita income and inequality grew and political transition took place. In the Philippines, aggregate income stagnated at a high level of inequality, and there was no political transition. In contrast to these cases, Taiwan and South Korea experienced fast growth but no democratization,[8] and inequality fell somewhat.[9] Our model suggest that this may have been because the gains of growth

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[7]The Gini coefficient was 0.34 in 1965 in South Korea and 0.31 in 1964 in Taiwan whereas it was 0.45 in Philippines in 1957 (see Fields, 1995).

[8]A process of democratization is now occurring rather rapidly in the Philippines, South Korea and Taiwan. Nevertheless, for the purposes of the present study it is interesting to understand the prolonged undemocratic regimes in these countries as opposed to the experiences of much faster democratization in Britain and other developing countries such as India, Colombia and Turkey. It is also significant to note, for example, that in the thirty years prior to its democratization, 1960-90, per-capita GDP in Korea increased by a factor of 6.89. This was considerably faster than British growth during the nineteenth century. During the period 1820-1870, British income per-capita increased by a factor of 2.75 (all data from Maddison, 1995).This motivates our claim that South Korea and Taiwan have experienced a period of very rapid growth, but no democratization and no Kuznets curve. Section 5 discusses how a simple extension of our model can account for delayed, rather than no, democratization in South Korea and Taiwan.

[9]For example, the average Gini coefficient over the period 1965-1970 was 0.34 for South Korea and 0.32 for Taiwan, and these averages fell to 0.33 and 0.30 respectively for the period 1981-1990, see Campos and

were equally divided between different social classes in South Korea and Taiwan, so the poor did not organize and the elite did not have to extend political power to wider groups until much later (see also the discussion in Rodrik, 1994; and Campos and Root, 1996; in support of such a view).

Revolution

Result 4 Suppose we are in Case 1, Condition 3 holds but Condition 5 does not. Then the rich start to accumulate at time $t = 0$ and the poor do not. The revolution threat binds at time $\hat{t}$ when $h_{\hat{t}}^r \geq \frac{\lambda(1-\mu)}{\mu(1-\lambda)}$, and a revolution takes place.

The main difference of this case from the Kuznets curve is that B is large relative to A. This implies that there is only a limited ability to tax the rich in a democracy, and it is more profitable for the masses to take over the means of production. Thus, a revolution will take place along the equilibrium path. This case is similar to pre-revolutionary Russia where social unrest increased, and attempts to bring more moderate groups, such as Mensheviks, to power were unsuccessful.

4 Historical Perspective

Our theory is motivated by historical evidence. Here we will provide an overview, emphasizing the evidence in support of the following four features:

1. Inequality was increasing before, and decreasing after, the extension of the franchise.

2. The elite controlled political power before the franchise and extended the franchise as a strategic move to avoid a revolution or at least very costly political unrest.

3. Democratization was directly (redistribution) or indirectly (expanded education) a key factor in the reduction in inequality.

4. There are differences in social conditions which make some periods more conducive to social unrest, and there are also differences in the level of organization of the masses across countries which are important in determining political outcomes.

Our most detailed evidence is from Britain, but evidence from France, Sweden and Germany also supports our model.

4.1 Inequality

Britain Data on income inequality for the nineteenth century are not extremely reliable. However, a number of studies using different data sources on Britain reach the same con-

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Root (1996), Table 1.1.

18

clusion. Inequality increased substantially during the first half of the nineteenth century, then started falling in the second half. The turning point appears to be sometime after 1870. This picture is also consistent with the findings of Crafts (1989), and of Lindert (1986) on wealth inequality, but is not completely uncontroversial (see Feinstein, 1988). Table 1 taken from Williamson's (1985) Table 4.2 gives a representative picture:

Table 1 - British Income Inequality

	Share of the Top 10%	Gini Coefficient
1823	47.51	0.400
1830	49.95	0.451
1871	62.29	0.627
1891	57.50	0.550
1901	47.41	0.443
1911	36.43	0.328
1915	36.46	0.333

A similar pattern also emerges from earnings inequality data reported in Williamson (1985) Table 3.2 where the Gini coefficient increases from 0.293 in 1827 to 0.358 in 1851 and falls to 0.331 in 1901.

Other Countries While again the data are sparse, Morrisson (1997) in his authoritative survey, argues that Germany, France and Sweden all went through a Kuznets curve. In Germany inequality rose during the nineteenth century and most researchers place the peak around 1900. For example, Kuznets (1963) finds that the income share of the top 5 per cent went from 28% in 1873-1880 to 32% in 1891-1900, stayed at 32% during 1901-1910, declining to 31% in 1911-13. Dumke (1991) finds the same income share to be 28.4% in 1880, rising to 32.6% in 1900 and falling to 30.6 % in 1913. Following the First World War inequality fell rapidly during the Weimar Republic. Kraus (1981) records that by 1926 the income share of the top 5% had fallen by 6.2%. Overall, Morrisson (1997) argues that the Kuznets curve in Germany peaked in 1900, went flat and started to fall in the 1920's. For France, Morrisson (1991, 1997) argues that inequality rose until 1870, with the income share of the top 10 percent peaking at around 50%. However, inequality started to fall in the 1870's, and in 1890 the income share of the top 10 percent was down to 45%, further falling to 36% by 1929. Finally, Soderberg (1987, 1991) records that income inequality grew in Sweden, peaking just before the First World War, levelling off or falling slightly during the 1920's and then falling rapidly thereafter.

4.2 Franchise Extension and the Threat of Revolution

Britain In Britain, the franchise was extended in 1832, and then again in 1867 and 1884 (and later in 1919 and 1928 when women were finally allowed to vote). When introducing the electoral reform to the British parliament in 1831, the prime minister Earl Grey said "There is no-one more decided against annual parliaments, universal suffrage and the ballot, than am I... The Principal of my reform is to prevent the necessity of revolution...I am reforming to preserve, not to overthrow." (quoted in Evans, 1983). This view of political reform is shared by modern historians such as Briggs (1959) and Lee (1994). For instance, Darvall (1934) writes: "the major change of the first three decades of the nineteenth century was the reform of Parliament by the 1832 Reform Act, and this was introduced by the Whigs...as a measure to stave off any further threat of revolution by extending the franchise to the middle classes." In fact, the years preceding the electoral reform were characterized by unprecedented political unrest including the Luddite Riots from 1811-1816, the Spa Fields Riots of 1816, the Peterloo Massacre in 1819, and the Swing Riots of 1830 (see Stevenson, 1979, for an overview).

The reforms that extended political power from a narrow elite to larger sections of the society were immediately viewed as a success not because of some ideal of enlightenment or democracy, but because the threat of revolution and further unrest were avoided (see Lee, 1994). Before the 1832 Reform Act, the total electorate stood at 478,000 out of a population of 24 million. Although the Act reduced the property and wealth restrictions on voting and increased the electorate to 813,000, the majority of British people could not vote. Moreover, the elite still had considerable scope for patronage since 123 constituencies contained less than 1,000 voters (the so-called "rotten-boroughs"), and there is evidence of serious corruption and intimidation of voters which was not halted in Britain until the Ballot Act of 1872 and the Corrupt and Illegal Practices Act of 1883 which introduced effective secret ballots at elections.

The process of increased representation gained momentum with the Chartist movement during the 1830's and 1840's. Consistent with our approach, leading chartists saw increased representation as the only way to guarantee a more equitable distribution of the gains of growth (see Briggs, 1959). In the meantime, the response of the elite to the Chartist movement was again one of preventing further unrest. For example, during the 1850's Lord John Russell made several attempts to introduce franchise reform arguing that it was necessary to extend the franchise to the upper levels of the working classes as a means of preventing the revival of political radicalism (Lee, 1994). In discussing the lead up to the

1867 Reform Act, Lee argues that "as with the first Reform Act, the threat of violence has been seen as a significant factor in forcing the pace; history was repeating itself." This interpretation is supported by many other historians, for example Trevelyan (1937) and Cowling (1967). The Act was preceded by the founding of the National Reform Union in 1864 and the Reform League in 1865 and the Hyde Park riots of July 1866 provided the most immediate catalyst (see Harrison, 1965). As a result of these reforms, the total electorate was expanded from 1.4 million to 2.52 million and then doubled again by the Reform Act of 1884 and the Redistribution Act of 1885 removed many remaining inequalities in the distribution of seats (see Wright, 1970). Overall, in Britain the timing of franchise extension corresponds quite closely to the peak of the Kuznets curve.

Other Countries In Germany, democracy was established with the creation of the Weimar Republic in 1919. There is no controversy amongst historians that this was due to the threat of social disorder and conflict following the defeat in the War (see Gerschenkron, 1943; Abraham, 1986). This date corresponds to the downturn of the Kuznets curve (though inequality had been flat since 1900). Even though, following the 1848 revolution, Frederick William IV of Prussia had created a parliament, Germany was non-democratic until 1919. The 1848 parliament was controlled by Junker landlords and then by the coalition of "iron and rye" after the 1870's. Moreover, voting was oral and controlled in rural areas by the landlords (see Gosnell, 1930 and Goldstein, 1983).

In France, before the revolution of 1848 property restrictions limited the electorate to about 241,000, about 0.75% of the population (see Cole and Campbell, 1989). The collapse of the regime led to a brief democratization which was cut short by the coup of Louis Napoleon in 1852. The real spur to democracy was the defeat of the French armies in the Franco-Prussian war of 1870, which created the Third Republic and the Paris Commune of the following year. This was followed by a seven year struggle for power as Orleanist and Legitimists tried to suppress worker parties. In 1877, the Republicans emerged victorious, and this is accepted to be the date for the establishment of democracy in France (see Carstairs, 1980, Cole and Campbell, 1989, Elwitt, 1975). Once again, this is approximately at the peak of the Kuznets curve.

Finally, in Sweden, while universal male suffrage was introduced in 1907 it was not until 1918 that true parliamentary government was introduced and the political power of the Conservative Party and the monarchy curtailed. 1918, the year where democracy became established, is once again at the peak of the Kuznets curve. Social unrest was again important in these reforms. The reform in 1907 had been preceded by strikes and demonstrations.

In 1918, social unrest was more intense: while Sweden was not a participant in the First World War, the revolution in Russia and the situation in Germany forced the concession of true democratic rights. Tilton (1974) records that in 1918 the Swedish Minister of War characterized the sentiments of the army and navy as "very revolutionary" and this view is supported by Verney (1957), Castles (1973) and the essays in Strth (1988).

4.3   Redistribution

Britain The Reform Acts of the 1867-1884 were a turning point in the history of the British state. In 1871 Gladstone reformed the civil service, opening it to public examination and making it meritocratic. Liberal and Conservative governments introduced a considerable amount of labor market legislation fundamentally changing the nature of industrial relations in favor of workers. During 1906-1914, the Liberal Party under the leadership of Asquith and Lloyd George introduced the modern redistributive state into Britain, including health and unemployment insurance, government financed pensions, minimum wages, and a commitment to redistributive taxation. As a result of these fiscal changes, taxes as a proportion of National Product more than doubled in the 30 years following 1870 and then doubled again. In the meantime, taxation also became highly progressive (see Lindert, 1989). Consistent with these trends, Lindert (1994) has recently shown that variables measuring democracy, in particular voter turnout, had a significant positive effect on the expansion of government expenditures on social programs (welfare and unemployment compensation, pensions, health care and housing subsidies) in the period from 1880-1930, again supporting the interpretation that democratization has been a key driving force of the radical shift towards redistributive fiscal and social policy.

Meanwhile the education system which was only open to the elite during most of the nineteenth century became more and more open to the masses (see Schofield, 1973 and Mitch, 1992). First, school leaving age was set at 11 in 1893, then increased to 12 in 1899 and special provisions for the children of needy families were introduced. Finally, the reform act of 1902 introduced public schooling as a duty of the government towards its people. As a result of these changes, the proportion of 10-year olds enrolled in school which stood at a disappointing 40% in 1870, increased to 100% in 1900 (see Ringer, 1979, p. 207). Many educational historians argue that the democratization of British society was the key driving force behind these changes (e.g. Simon, 1960).

Williamson (1985) sees the increase in the supply of skills as the key reason for the fall in inequality. Therefore, to the extent that mass schooling contributed to this increase,

the education policies were a key factor in reducing inequality. This is summed up by Lindert and Williamson (1985) "the rate of skill deepening reached impressive levels in the era following the educational reforms of the 1870's, coinciding with the drop down Britain's Kuznets Curve." Moreover, the data already reported in the previous subsection suggests that the reduction in income inequality was faster than the compression in earnings inequality which is consistent with the view that increased and more progressive taxation played a key role in reducing inequality.

Other Countries In Germany, during the period where the Kuznets curve peaked, primary school enrollments were flat. However, as is well known, social conflict was met by the creation of a welfare state by Bismarck in the early 1880's (see Tampke, 1981; and Baldwin, 1990).[10] While this was a small amount of redistribution by contemporary standards it seems to have been enough to stop the rise in inequality. Moreover, the fall in inequality which began in the 1920's coincides with the large increase in redistribution initiated by the Weimar state (see Flora, 1983). In France, as in Britain, democratization coincided with important educational reforms[11]. In 1881 the government abolished fees in public primary schools, and in 1882, 7-year compulsory education was introduced. The primary enrollment rate increased from 66% in 1863 to 82% in 1886. Moreover, central government expenditure as a percentage of GDP increased by one third from 9.4% in 1872 (a figure itself inflated by the war) to 12.4 % in 1880 (Flora, 1983). For Sweden, as for Germany, there was little impact of democratization on educational enrollments, however, Lindert's (1994) data shows that before 1920 there was no redistribution at all in Sweden, while after this date it jumped up sharply.

4.4 Revolution Opportunities

An important part in the timing of political reform was played by increased inequality as indicated by the coincidence of democratization with the peak of the Kuznets curve.

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[10]Another possible method of redistribution, which has received much recent attention in the context of the "East Asian Miracle", is land reform (see Campos and Root, 1996). Whether or not land reform is attractive to the elite, and acceptable to citizens depends on where revolutionary threats come from. Typically it is urban workers who pose the biggest threat to regimes, and they were the target of Bismarck's reforms, not rural peasants. In Germany the proportion of the labor force in agriculture in 1870 was around 45% (see Flora, 1983) while for Britain it was already down to 20% by this date (Michell, 1962). In South Korea and Taiwan this percentage was around 80%.

[11]Easterlin (1981) notes: "to judge from the historical experience of the world's 25 largest nations, ..., a major commitment to mass education is frequently symptomatic of a major shift in political power and associated ideology in a direction conducive to greater upward mobility for a wider segment of the population."

Equally important in determining the timing of the extension of franchise were economic depressions and wars. In Britain, the move towards democracy in 1867 was spurred by a sharp business cycle downturn (Lee, 1994). Also after 1873, the world economy went into a prolonged slump (widely recognized to be the worst of the nineteenth century), which caused increasing distress over the next decade. In France, the Franco-Prussian war was of crucial importance in leading to social unrest, to the Paris Commune and to the Third Republic. In Sweden, the end of the First World War appears to have increased the revolutionary sentiment (Verney, 1957, and Castles, 1973). And finally, in Germany, the defeat in the First World War was instrumental in creating social unrest and to the founding of the Weimar Republic.

Social unrest was certainly as strong in Germany during the mid nineteenth century as it was in Britain and France. However, while there were no strong socialist parties in Britain and France (a point stressed by Stephens, 1989, for example), the Social Democratic Party in Germany was by far the largest left-wing party in Europe at that time. Our model then predicts that German elite should have had more flexibility in dealing with social unrest by promising future redistribution. This is consistent with the facts. While there was democratization in Britain and France, in Germany the first welfare state was instituted, without a real transfer of political power to the working classes.

5   Extensions

In this section we will informally discuss some extensions, focusing especially on those which are relevant for the model of Section 3.[12]

Heterogeneity Among the Rich   It is straightforward to extend the model so that there is a distribution of asset levels, $G_t(h)$ among the rich, with lower support $\underline{h} > 1$. In this case, $H_t = \lambda h_t^p + (1 - \lambda) \int h dG_t(h)$. The rest of our setup and results remain unchanged, except that now the tax rate may be positive even when the elite are in power. First, suppose that $G_t(h)$ is skewed to the right. In this case, the median rich agent would like a zero tax rate, and none of our results need to be modified. In particular, given decreasing returns to human capital, all rich agents converge to the same level of human capital, h_{SS}. However, if $G_t(h)$ is skewed to the left, then the median rich will set a positive tax rate. Now, whether the revolution constraint becomes binding or not depends on this tax rate. If $G_t(h)$ is sufficiently skewed, then this tax may be high enough to ensure accumulation by the poor and avoid the revolution constraint. The interesting feature is that in this case

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[12]We are grateful to the referees for bringing out some of the issues discussed in this section.

the amount of conflict among the elite has an impact on the conflict *between* the elite and the poor.

Imperfect Substitution Among the Rich and the Poor We can think of the rich agents supplying skilled labor and the poor supplying unskilled labor, with imperfect substitution between these two types of labor. For example: $Y_t = A(\lambda h_t^p)^\alpha ((1-\lambda)h_t^r)^{1-\alpha}$. In this case, differences in λ would have another, perhaps more intuitive, effect on the likelihood of revolution. When λ is high, unskilled wages will be depressed so a given h_t^r/h_t^p would translate into a higher level of income inequality.

Costs of Redistributive Taxation In order to make our point in the simplest model, we have assumed redistributive taxation to be without distortions. It is straightforward to see that if this assumption is relaxed, then a democratic society would actually tend to an income level $Y_{SS}^3 \leq Y_{SS}^2$. Whether this inequality is strict or not will depend on a number of other features which are not crucial for our story but would strengthen the conclusion that the lack of robust correlation between democracy and growth may not be surprising.

Targeted Taxes and Transfers We have so far not allowed the transfer T_t to be negative or person specific, so the elite preferred no intervention. With person specific transfers or lump-sum taxes used to subsidize production, the elite, when in power, would want to use their political power to redistribute in their favor (one can interpret the Corn Laws or Combination Acts which outlawed unions in the nineteenth century Britain in this light). However, in doing this they have to respect the revolution constraint again: a high tax on the poor would make a revolution worthwhile. The interesting implication is that in this case the elite will often tax the masses just enough to make them indifferent between the existing system and a revolution. This case makes increasing inequality more likely when the elite is in power and may fit the example of some African cases where state power appears to have been used more often to redistribute from one group to another.

Why is Democracy Irreversible? We have assumed that once the elite extend the franchise they cannot rescind it. This is clearly unrealistic, since there are examples of coups which have restricted the political participation of the masses. This issue also raises the question of why the poor are initially excluded from the political process. Part of the answer appears to be that political power depends on wealth. The elite initially are much wealthier than the masses, and can use their wealth in order to control the political process. Once the franchise is extended, the distribution of income and wealth becomes more equal, and this implies that the masses now possess the resources to take part in the political process, and a return to autocracy becomes much harder. We could easily introduce this in

our model by making μ a function of the income level of the poor, for example, $\mu(y^p)$ (with the restriction that $\mu(y^p) \leq \bar{\mu}$ so that democracies do not necessarily lead to a revolution). In this case, once the franchise is extended and y^p increases, the poor are much better organized, so even if inequality falls, the threat of revolution does not totally disappear.

This reasoning also suggests a reason why South Korea and Taiwan may have started the democratization process over the past ten years. Our simple model predicts that they should remain an autocracy forever. However, if we think of political power as related to income, at some point μ will increase sufficiently so that the elite have to extend the franchise, despite the low level of inequality. With this modification, our approach predicts that, as in the case of South Korea and Taiwan, economies which start with relatively low inequality should experience high growth and no democratization for a while and then once the masses become sufficiently wealthy, social unrest should force democratization.

Forward Looking Elites Finally, in the model of Section 3 (as opposed to Section 2), the agents are "myopic" because they live only one period and do not care about the dynamics after they die. If we introduce more general kinds of altruism or long horizons for the agents this aspect will change. In this case, one might conjecture that the elite may accumulate slower than otherwise in order not to hit the revolution constraint. Intuitively, the members of the elite may realize that if they collectively have assets worth $H^* = \lambda(1 - \mu)/\mu$, the revolution threat will become active. So they may stop accumulation at some level less than H^*. However, the important point to note is that this requires some kind of coordination from the "state". If each member of the elite is deciding individually, he would ignore his impact on the aggregate stock of assets, and thus would "free-ride" by accumulating more. Such behavior by all the members would take the economy to H^*.

6 Concluding Remarks

This paper has offered a simple model of political transition and reform, and investigated the implications for the dynamics of growth and inequality. The two main contributions of this paper are: (1) it explains why the rich elite may want to extend the franchise, despite the fact that this implies higher taxation in the future; (2) it offers a new explanation for the presence of a Kuznets curve in the development experience of Western societies, which appears to accord well with the data.

The emphasis in this paper on political reform as a way of changing future political equilibria may have a number of other applications. Recall that the important feature of franchise extension in our model is that it changes who the median voter will be in

the future, and thus commits the elite to future redistribution. Other reforms also affect future political balances. For example, electoral systems and relations with international institutions influence political equilibria, and thus may act as commitments to certain policies. Also, programs differ in how easily they can be reversed. For example, in most countries, entitlement programs appear to be very difficult to cut. This raises the question of whether there was a commitment motive in play when these programs were instituted.

There are a number of issues we have not treated satisfactorily in this paper. First of all, although Britain, Germany, France and Sweden fit our story, the U.S. does not. In the U.S. it is difficult to get a picture of the extent of suffrage because of a plethora of state level restrictions (on the basis of wealth, property ownership, race etc., see Williamson, 1960; Crotty, 1977). Nevertheless, the best guess seems to be that by the 1850's, around 50% of adult white males could vote. Such a level of suffrage was sufficient to generate substantial redistribution in other countries. Inequality, however, increased until around 1930 and then started declining. The fact that the downturn of the Kuznets curve is once again related to increased redistribution, which followed the Great Depression, is encouraging for our theory, but why redistribution started 80 years after democratization is not easy to determine. We conjecture, together with a number of historians, that the U.S. was exceptional, especially due to high levels of immigration. Historical sociologists such as Kaelble (1986b) argue that U.S. citizens saw themselves as very upwardly mobile, partly because the lower ranks of the society were taken by migrants. This may have changed in the late 1920s with the depression (and the fact that immigration was severely curtailed in the 1920's). Even though these arguments may justify why our simple model does not fit the U.S., more research is required. Second, our model predicts that democratization is more likely when inequality is high. This however ignores another important effect. In general, when inequality is high, democratization is quite damaging to the elite who will be taxed more heavily. This implies that the impact of inequality on democratization will be determined by the interplay of two offsetting forces. Third, we have not allowed the elite to use a "repression" strategy, such an extension may be relevant for a number of Latin American and African countries. Finally, there are major differences in the form of redistribution across countries. In Britain, education increased substantially after the franchise due to increased government support. In contrast, in Germany, early redistribution was via the welfare state. It is important to understand what might cause these differences, and whether the same forces are also important in shaping the differences in the extent and form of redistribution we observe today.

7 Appendix

We now analyze the model of Section 2 without the restriction to Markovian strategies. More specifically, we look for subgame perfect equilibria. We will find that there exists a cutoff probability of state μ^h, $q^{**} < q^*$ such that when $q > q^{**}$, there will be redistribution without democratization which prevents a revolution. In contrast when $q < q^{**}$, the only equilibrium will feature the extension of the franchise when $\mu_t = \mu^h$.

First, note that if the masses initiate a revolution at time t, then effectively the game ends with $V^p(R) = \mu_t A H / \lambda (1 - \beta)$. Therefore, in any subgame perfect equilibrium, $\sigma_t^p(\mu^h, E|., .) = (\rho = 1)$ only if $V^p(R) > \bar{V}_t^p$ where $\bar{V}_t^p$ is the payoff of the masses in the continuation game at time t without a revolution.[13] This immediately implies that $\sigma_t^p(\mu^l, E|., .) = (\rho = 0)$. Next, note that after $\phi_t = 1$, and ignoring revolution, the elite are down to their minimum payoff, since $\tau = \hat{\tau}$ in all future periods. Therefore, $\sigma_t^p(\mu^h, E|\phi = 1, .) = (\rho = 1)$ only if $V^p(R) > V^p(D)$. Assumption 2 ensures that this inequality never holds, thus in any subgame perfect equilibrium, $\sigma_t^p(\mu^h, E|\phi = 1, .) = (\rho = 0)$ irrespective of the history of the game up to this point. So we have pinned down all of the strategies by the masses other than $\sigma_t^p(\mu^h, E|\phi = 0, \tau^r)$. Now consider this.

Let $\bar{V}_t^p(\mu^h, E|\phi = 0, \tau^r)$ be the continuation payoff of the masses, conditional on $\phi = 0$ and τ^r, when they play $\rho_t = 0$. Then, in any subgame perfect equilibrium, $\sigma_t^p(\mu^h, E|\phi = 0, \tau^r)$ will only put positive probability on $\rho = 1$ if and only if $V^p(R) \geq \bar{V}_t^p(\mu^h, E|\phi = 0, \tau^r)$ and will play $\rho = 1$ with probability 1 if $V^p(R) > \bar{V}_t^p(\mu^h, E|\phi = 0, \tau^r)$.

Suppose $q < q^*$. Recall from Proposition 1 that in this case, there were no Markov Perfect Equilibria with redistribution and no democratization. Let $\tau^r(\mu_t)$ be the tax rate chosen by the elite in state μ_t at time t. Consider the following candidate equilibrium strategy combination. For the elite: $\sigma_t^r(\mu^h, E) = (\phi_t = 0, \tau_t^r = \hat{\tau})$ and $\sigma_t^r(\mu^l, E) = (\phi_t = 0, \tau_t^r = \bar{\tau})$ where $\bar{\tau} \leq \hat{\tau}$. For the masses, $\sigma_t^p(\mu^j, E|\phi_t = 0, \tau_t^r) = (\rho = 0)$ if $\tau^r(\mu_s) \geq \hat{\tau}$ if $\mu_s = \mu^h$ and $\tau^r(\mu_s) \geq \bar{\tau}$ if $\mu_s = \mu^l$, for all $s \leq t$, and $(\rho = 1)$ otherwise. Then, the payoffs in this candidate equilibrium are given by:

$$\bar{V}^j(\mu^h, E) = (1 - \hat{\tau})Ah^j + \hat{\tau}AH + \beta\left[q\bar{V}^j(\mu^h, E) + (1 - q)\bar{V}^j(\mu^l, E)\right] \tag{9}$$

$$\bar{V}^j(\mu^l, E) = (1 - \bar{\tau})Ah^j + \bar{\tau}AH + \beta\left[q\bar{V}^j(\mu^h, E) + (1 - q)\bar{V}^j(\mu^l, E)\right] \tag{10}$$

for $j = p$ and r. Now define $\bar{\tau}$ such that $\bar{V}^p(\mu^h, E) = V^p(R)$. $\bar{\tau} < \hat{\tau}$ exists by Assumption 2. Therefore, the above strategies are best response for the masses in all subgames. Next, we

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[13]We are now using σ_t instead of σ, which stands for σ conditional on the public history of the game up to time t. The public history includes all past actions (but not mixing probabilities when these are used).

28

need to check whether they are best response for the elite. Clearly, if the elite reduce the tax rate in state (μ^h, E), this will immediately cause a revolution, thus $\sigma_t^r(\mu^h, E) = (\phi_t = 0, \tau_t^r = \hat{\tau})$ is optimal conditional on the history up to time t characterized by $\tau^r(\mu_s) \geq \hat{\tau}$ if $\mu_s = \mu^h$ and $\tau^r(\mu_s) \geq \bar{\tau}$ if $\mu_s = \mu^l$, for all $s \leq t$. In contrast, if the elite deviate from $\sigma_t^r(\mu^l, E) = (\phi_t = 0, \tau_t^r = \bar{\tau})$ to $\sigma_t^r(\mu^l, E) = (\phi_t = 0, \tau_t^r = 0)$, this will not cause a revolution immediately. It will only do so when the state changes to (μ^h, E). But in this case, the elite can play $\sigma_t^r(\mu^h, E) = (\phi_t = 1)$ and as we saw above, the best-response of the masses is always $\sigma_t^p(\mu^h, E|\phi = 1, .) = (\rho = 0)$ irrespective of the history of the game up to this point. The payoff to the elite from following this deviant strategy starting in the state (μ^l, E) is:

$$V_d^r(\mu^l, E) = Ah^r + \beta \left[qV^r(D) + (1-q)V_d^r(\mu^l, E) \right]$$

Therefore, the above candidate equilibrium strategy combination is a subgame perfect equilibrium if and only if $\bar{V}^r(\mu^l, E)$ given by (9) and (10) is greater than or equal to $V_d^r(\mu^l, E) = \frac{Ah^r + \beta qV^r(D)}{1 - \beta(1-q)}$. It is straightforward that if $q = q^*$, $\bar{V}^r(\mu^l, E) > V_d^r(\mu^l, E)$ and at $q = 0$, $\bar{V}^r(\mu^l, E) < V_d^r(\mu^l, E)$. Also, $\bar{V}^r(\mu^l, E)$ falls faster in q than $V_d^r(\mu^l, E)$. So there exists q^{**}, such that for all $q < q^{**}$, $\bar{V}^r(\mu^l, E) < V_d^r(\mu^l, E)$, and there exists no equilibrium with redistribution and democratization.

Finally, when $q > q^*$, the Markov Perfect Equilibrium with redistribution and no democratization continues to be a subgame perfect equilibrium, and with a similar reasoning to the above, we can construct others which feature some redistribution both in state $\mu_t = \mu^h$ and $\mu_t = \mu^l$, but all these equilibria have the same structure of keeping the masses just indifferent between revolution and no revolution in the state (μ^h, E), thus give the same payoffs to the elite and the masses.

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