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Abstract

This paper presents a theoretical account of suffrage extensions from a specific perspective: the strategic role of the middle class in the struggle for political power. Extensions are analyzed as a game among three players: the elite, the middle class, and the poor. To thwart the threat presented by the poor, the elite had to cede economic and political power to the middle class, who in turn might have an interest in extending suffrage further, either immediately or in some future. Whether suffrage was extended to the poor in one step or first only to the middle class depended on state's capacity to repress and the strength of the middle class, along with some economic variables. Consistent with this theory, empirical results show that suffrage extensions did not reduce rebellious activity, but rather that economic growth and military power are strong predictors of decreases in the number of rebellions.

Keywords

Middle class, the; revolutions; suffrage extensions

1. Introduction

Extensions of suffrage along class lines occurred under the shadow of distributional conflicts. Inclusive political institutions were adopted under a common assumption that votes would have economic consequences. Studies of suffrage extensions converge on the view that, as far as they led to redistributive policies, extensions of the right to vote to the poor constituted concessions, which successfully defused economic and social conflicts. Yet some puzzles invite closer scrutiny. Notably, extensions of suffrage often occurred in steps, first only to the middle class and only then to the poor. Moreover, violence and repression often continued in the aftermath of suffrage reforms. Did rulers anticipate that conflicts would continue when extending suffrage? Or did they miscalculate?

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This paper argues that the rulers did not miscalculate. The purpose of partially extending suffrage, to the middle class, was to mobilize political support for a regime, to engage the middle class in defense of the distributional status quo. As a result, in many cases revolutionary activities did not fade immediately after suffrage had been extended. Nor did the extensions necessarily lead to redistribution or other economic policies in favor of the poor. Conflicts and repressions may still have prevailed, as was the case of France during the 'June Days' uprising and the Paris Commune, or of Spain in the 1870s, where there had been an 'interminable series of civil wars, revolutions, and military dictatorships.' (Seymour and Frary, 1918: 227). Paths to democracy have not always been peaceful.

In this paper, the process of suffrage extensions is analyzed as a dynamic game among three players: the elite, the middle class, and the poor. The theoretical mechanism is as follows. The elite, which faces a constant risk from rebellion by the poor, is the only policy maker in period 0. When the threat of rebellion is severe, the elite may choose to extend suffrage to the middle class. By ceding the power of policy making to the middle class, the elite invests it with a stake in protecting their common interests. The coalition of the elite and the middle class is made possible by two basic facts: that all wealth would be confiscated and redistributed if the poor win, and that both the elite and the middle class are opposed to redistribution to the poor. Once granted suffrage, the middle class has power to extend suffrage further, either immediately or in some future. Whether the middle class extends suffrage to the poor depends on the economic policy that would have been adopted by the poor, as well as on stochastic fluctuations in the strength of the middle class and state capacity to repress revolutionary threats.

The model has several implications that are consistent with empirical facts. First, political reforms and redistributive policies may not defuse conflicts. In addition to a number of historical cases in which domestic violence continued following an extension, in a large- N study we find no statistical evidence that extensions lead to a decline of social unrest. The effect of suffrage extensions, whether to some or to all adult males, on peace, is limited by the capacity of states to effectively contain revolutionary threats, as well as by the strength of the middle class. The inclusion of a strong middle class in the ruling coalition is likely to reduce the risk of rebellion and facilitate a peaceful transition. By contrast, ample state capacity to repress has a non-monotonic effect on social unrest, because the ability to command repressive instruments may undermine the incentive for reform and fuel rebellions. This prediction is supported by the finding of a significant and yet non-monotonic relationship between social unrest and the number of military personnel employed by the state.

Secondly, the paper provides an account for the cross-country variation in paths toward universal male suffrage.¹ Transitions from partial to universal suffrage become more likely when the strength of the middle class is at an intermediate level. The threshold values defining different equilibrium outcomes are determined by economic conditions, particularly the income of players and a common value for public goods. When there is a large income gap between the poor and the middle class, the incentive of the poor to rebel increases. The increase in the value of public goods has a similar effect on the utility gain from rebellions and hence may force the middle class to extend suffrage further in order to accommodate the poor. We empirically find a positive relationship between the degree of urbanization and social unrest. This is likely due to a

combination of the effects of income gap and the value of public goods where the degree of urbanization is high.

The paper follows a large literature on suffrage extensions in the context of social revolutions (Collier, 1999; Rosendorff, 2001; Acemoglu and Robinson, 2000; Boix, 2003; Aidt and Jensen, 2011). The explanations center on the redistributive effects of extensions, where political-economic variables shaping the incentive to extend are different. According to Acemoglu and Robinson (2000), what matters most is the credibility of the threat from revolutionaries. In Rosendorff (2000), the driving factor is the economic cost of repression. In Boix (2003), the key is income inequality and the mobility of capital. This paper builds on important insights from these models and analyzes economic conditions such as income inequality in a similar fashion. A difference of our explanation is that extension plays the role of mobilizing political support in addition to facilitating policy concessions. The logic elaborated here is related to arguments about the effects of war mobilization (Tilly, 1995; Ticchi and Vindigni, 2009; Scheve and Stasavage, 2012), with the difference that the threat to rulers comes from domestic conflicts instead of foreign wars. When the threat is severe, extensions may qualify as a strategy of divide-and-rule.

The paper also speaks to the literature on dynamic enfranchisement. The recursive structure of the model is close to Jack and Lagunoff (2006) and Huang (2012), where extensions are made possible by an efficiency gain associated with the incentives of disenfranchised economic agents. Leventoglu (2011) shows that transitions from partial to full democracy are determined by the expected social mobility for future generations. The difference in our model lies in that the middle class brings change not only to economic policies, but also to the outcome of conflicts. So elites dilute their power to gain support from a strong and politically active middle class. As a result, the weakness of the middle class may be a reason for political stagnation: rulers may hold onto power even when the middle class would have adopted democratic institutions. This perspective echoes historical works on the role of the middle class in enhancing peaceful order, such as Morazé (1966), Moore (1967), and Luebbert (1991).

Last, the model takes into account the effect of extension on the level of public goods, a point emphasized by Lizzeri and Persico (2004) and Llavador and Oxoby (2005). In our model, the elite and the middle class prefer more public goods than the poor does, because their incomes are higher than the mean level. The different preferences for public goods become a source of economic conflict among the players. The model also suggests that government spending may not increase after extensions along class lines, a prediction consistent with findings by Scheve and Stasavage (2012).

The rest of the paper proceeds as follows. The next section discusses historical patterns of the expansion of suffrage. Section 3 presents the formal model of the interaction among the elite, the middle class, and the poor. Section 4 provides econometric evidence in support of the theory. The final section concludes.

2. Extension of suffrage as a historical phenomenon

Voting rights were highly restricted before the 19th century and reform to extend them was often a contentious issue. The British Home Secretary William Windham, when addressing the Commons in 1794, remarked that the words ‘parliamentary reform’ were

'used by the seditious societies for purpose as a mark of their real intention of a total annihilation of all property, constitution and religion' (Foot 2005: 56). The primary reason against extension was fear about the confiscation of property. As Edmund Burke warned about the French Revolution, 'This legislative assembly of a free nation sits, not for the security, but for the destruction, of property' (quoted in Foot 2005: 49).

Figure 1 shows the historical trend of countries with different types of restrictions on suffrage.² In the mid-19th century, 80% of countries imposed some economic restrictions on male voters. Since the 1850s, the proportion of countries with least restrictions (universal male suffrage or requiring just economic independence) increased fairly quickly, while at the same time, the proportions of countries with suffrage only for the elite (with requirements of estate representation or property) and for the upper and middle class (with some requirements of income, tax, or property) continued to decline. After the 1960s, few countries had restrictions on suffrage according to economic status. The contention over the issue of suffrage is a historical phenomenon.

While countries have converged to universal suffrage over time, their paths toward it are quite different. As Figure 2 shows, 40% of the countries extended suffrage at least twice to lower classes. Some countries undertook reforms to eliminate restrictions up to four times or more. Sometimes, countries geographically adjacent or similar in economic conditions differed in both the number of extensions and their timing. The extensions in Sweden and Norway occurred early and entailed several steps. By contrast, the reforms in Finland and Iceland took place later in the 20th century and implemented universal male suffrage directly. Moreover, we can learn from Figure 2 that although the transition to universal suffrage in principle can take arbitrarily many steps, the majority of countries extended suffrage no more than twice. Hence, our assumption about the two-step expansion (first to the middle class, then to the poor) is without a loss of generality.

Another feature of the evolution of suffrage is that extensions tended to cluster around specific historical moments. The first wave of extension emerged in 1848, when absolutist monarchs were severely threatened by revolutionaries in Europe and Latin America. Most extensions during this time were partial (e.g. Denmark, Switzerland, the Netherlands, Hungary, Bolivia, Costa Rica). During the 20th century, two waves of extensions followed the two World Wars. A number of reforms were adopted in newly independent countries and suffrage was granted universally to adult males.

The puzzles to be addressed are why patterns of suffrage have varied so much across countries and over time, and how they are related to social conflicts. We argue that the strength of the middle class is an important explanatory factor. In countries where industrialization took place early and the middle classes were preponderant, the ruling groups were able to enjoy stability for decades before universal suffrage was finally implemented. When the middle classes were small in size and did not have much power, reforms came later, sometimes under the shadow of violent conflicts.

Before formally analyzing the strategic interaction among social groups, it is worth discussing who the middle classes were and what instruments they brought to defend the status quo. Historically, the middle class consisted of different economic and social groups in different countries. They might be industrialists in Britain, the petty bourgeoisie in France, agricultural capitalists in Sweden, small landlords in Denmark, or merchants and civil servants in Greece, and so on. A feature of each is that they had considerable financial resources and economic power, but were previously excluded from the exercise

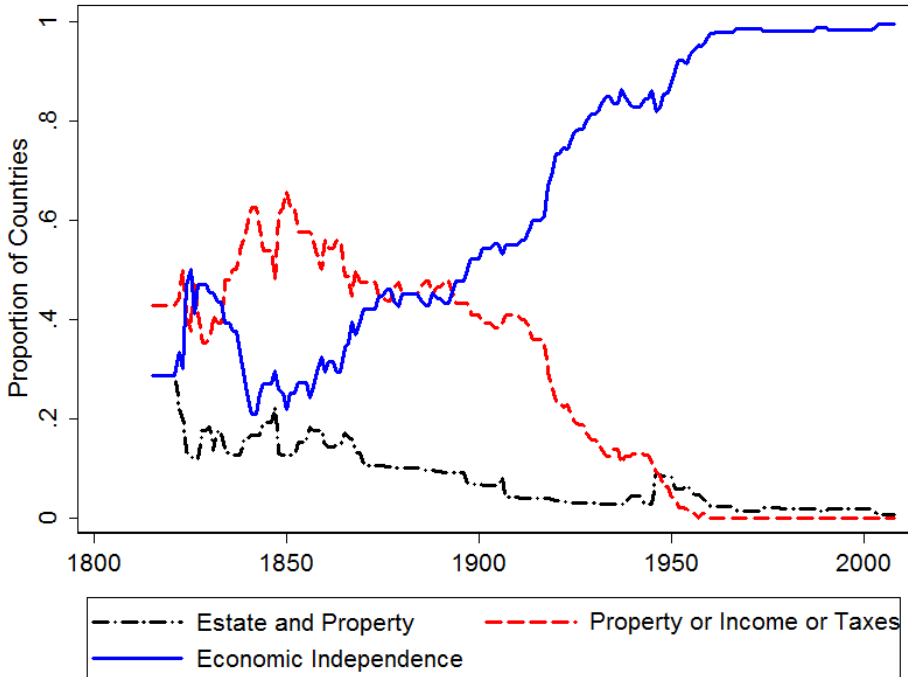


Figure 1. Proportion of countries with different kinds of suffrage. The vertical axis is the proportion of countries worldwide with different restrictions on suffrage by year. The solid curve measures the proportion of countries in which all economically independent adult males were eligible to vote. The dashed curve corresponds to countries in which adult males were qualified for suffrage if they met some thresholds or requirements about property, income, tax payment, or literacy (the first digit for the variable ‘franchise’ is coded between 3 and 5 in PIPE). The dash-dotted curve corresponds to countries with most restrictions: estate representation or property requirement (the first digit for the variable ‘franchise’ is coded as 1 or 2).

of political power. The extensions of suffrage served a purpose of mobilization, helping the middle classes act collectively to defend property and economic order. The effect of mobilization might come from the acquired ability of the middle class to organize politically. In Europe during the 19th and early 20th century, a normal consequence of the expansion of suffrage was the rise of liberal parties. The liberal parties gathered political support for ruling coalitions from urban residents and reduced the antagonism between traditional elites and the poor. For example, it is argued that the Liberal governments in Britain and France ‘responded in 1919 and 1920 to this labor unrest . . . with a mixture of accommodation, assimilation, and control’ (Luebbert, 1991: 196).

A potential challenge to our argument is that elites and the middle class may have divergent interests, and that the middle class might have actually been a revolutionary force. While the political changes in Europe during the 19th century were often referred to as Bourgeois Revolutions, the term actually characterizes the political dominance of

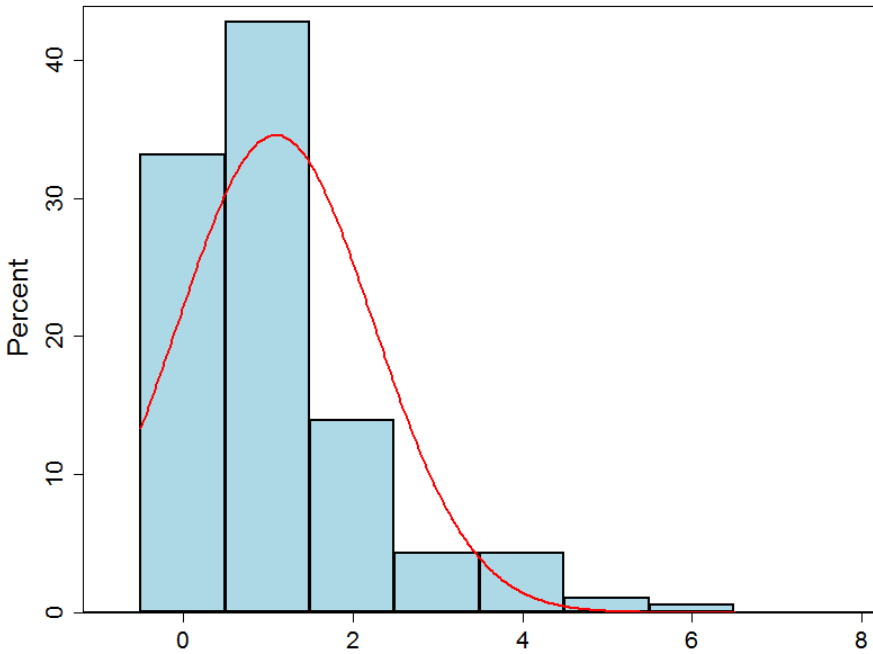


Figure 2. Cross country variation in number of extensions. The vertical axis is the percentage of countries worldwide that had extended suffrage for N times in history, where N ranges from 0 (countries adopted universal male suffrage when acquiring independence) to 6.

the middle class *after* social revolutions (Mooers, 1991: 136–137). Moreover, the fact that the bourgeoisie had policy agendas opposed to elites does not mean that the former would necessarily ally with the poor. The middle classes shared the economic interests of elites in preventing the confiscation of properties. When revolutions were unavoidable, such as in the case of France 1848 and 1871, the middle classes preferred joining the battle to protect their wealth rather than waiting passively for their fate.

3. Model

3.1. Economy

In this section we consider a model in which social groups compete for political power to pursue their economic interests. The environment features discrete time and infinite horizons. All players discount the future by a constant rate $\beta \in (0, 1)$. The society is populated by a unit continuum of individuals. Each individual belongs to one of the three groups (classes): the elite (e), the middle class (m), and the poor (p). The population size of each group is n_i , where $i = \{e, m, p\}$. So $\sum_i n_i = 1$. We further assume that the population size of the middle class is larger than that of the elite, but that the poor is the majority group of the society: $0 < n_e < n_m < \frac{1}{2} < n_p < 1$. This basic assumption

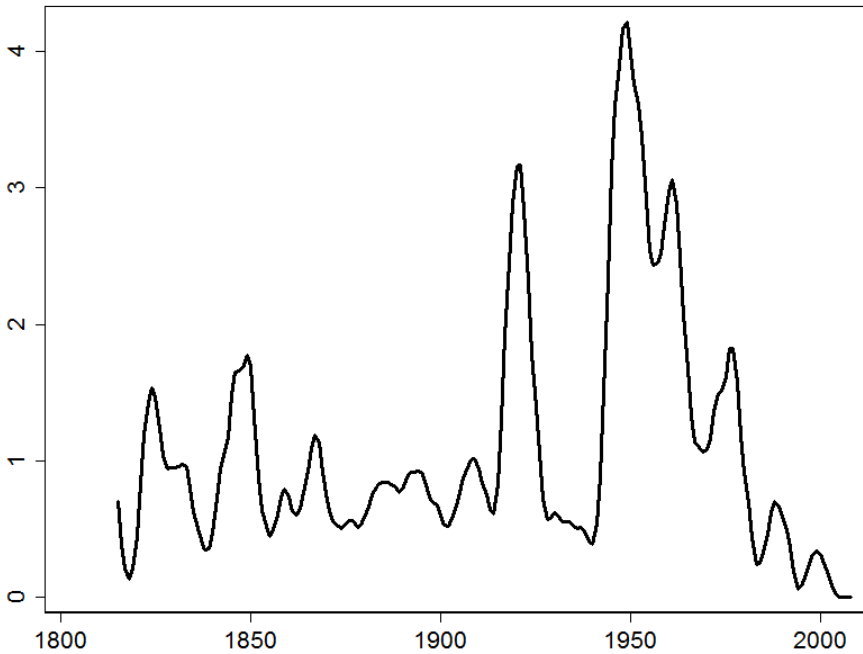


Figure 3. Number of suffrage extensions along the class line in each year. The horizontal axis is year. The vertical axis is the number of suffrage extensions along the class line (i.e. any increase in the first digit of the variable ‘franchise’ in PIPE) among all countries around the world (LOWESS smooth). The graph provides an intuition about the waves of suffrage extensions in history.

carries the implication that once suffrage is partially extended from the elite to the middle class, the latter becomes the median voter; when suffrage is universal, the poor becomes the median voter. Here the assumption regarding population size is not a statement about empirical facts, but rather a formulation to capture the economic consequence of suffrage extensions.³

Individuals are endowed with personal wealth. In each period, each individual’s personal wealth generates a fixed amount of income. Income is homogeneous within but heterogeneous among groups. Write income for an individual from group i as y_i , the mean income of the society is $\bar{y} = \sum_i n_i y_i$. We assume that $y_e > y_m > \bar{y} > y_p$. This implies that the preference of the elite and the middle class regarding redistribution is different from that of the poor, since only the income of the latter is below the mean. This assumption is consistent with the fact that median income is usually lower than mean income in most countries. A relaxation of the assumption is likely to affect comparative static but not the main conclusions of the model.⁴

In each period, the median voter in the franchised groups chooses a policy platform $\{\tau, X\}$, where τ is a linear tax rate and X is the provision of public goods. Public goods

must be financed out of tax revenues. Taxation involves a deadweight loss, $\frac{\eta}{2}\bar{y}\tau^2$, presumably due to inefficiency in bureaucratic system or rent seeking. Here η is a measure of fiscal distortion. Available revenue can be either redistributed or invested as public goods. Since the population size of society is 1, the amount of redistribution to each individual is equal to revenue net of the investment in public goods: $\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2 - X$.

Individuals cannot save. The utility of i consists of two parts: $U_i = u(c_i) + \xi I(X)$. The first term, $u(c_i)$, is the utility deriving from private consumption, where $c_i = y_i(1 - \tau) + (\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2 - X)$. $u()$ satisfies regular Inada conditions: $u(0) = 0$, $u(c) > 0$, $u'(c) > 0$, $u'(c) < 0$, $u'(\infty) = 0$, and $u'(\infty) = 0$. The second term, $\xi I(X)$, is the utility from public goods uniform for all individuals. The production function of public goods is $I()$. We assume $I(0) = -\infty$, hence any viable policy platform must provide positive amount of public goods.⁵ Moreover, we assume $I'(X) > 0$, $I''(X) < 0$, $I'(0) = \infty$. Individuals share a common value ξ for public goods.

At time 0, only the elite has suffrage and decides $\{\tau, X\}$. The elite, in a similar fashion to Acemoglu and Robinson (2000), faces a potential rebellion of the poor. If the poor win, the society will be transformed into an egalitarian regime. All personal wealth will be confiscated and then equally redistributed to all individuals. The income of each individual will be the same hereafter. The elite is able to defeat the poor alone with a probability equal to $q \in (0, 1)$. Here q measures the state capacity of employing coercive instruments such as the police force or military to defeat revolutionaries. When the middle class becomes enfranchised and determines policies, however, the probability of defeating the poor by the ruling coalition of the elite and the middle class becomes $q\gamma$, where $\gamma \in (1, \frac{1}{q})$ is a parameter capturing the strength of the middle class. In other words, the participation of the middle class consolidates a grand political coalition and increases the ability of the state to defeat revolutionaries. For example, the political reform implemented by Bismarck in Germany might have been intended to facilitate ‘mutual concessions of aristocracy and upper bourgeoisie governmental inducements to both, and an attempt to repress or assuage any popular opposition to such a restricted realignment of privilege.’ (Alan Mitchell, quoted in Mooers 1991: 144).

3.2. Economic policy

The median voter determines two things. First, in the case of partial suffrage, the median voter decides whether to extend suffrage at the beginning of each period. The elite can extend suffrage to the middle class, but not directly to the poor. The middle class, once in power, may extend it to the poor.⁶ Second, the median voter within franchise groups decides economic policy to be implemented: $\{\tau, X\}$. For simplicity, we assume away the possibility of direct policy concession. So the median voter makes one period optimization when setting τ and X . With the optimal policy of the median voter from group i as $\{\tau_i^*, X_i^*\}$, the problem is:

$$\begin{aligned} \max_{\tau_i^*, X_i^*} \quad & u(y_i(1 - \tau_i) + \bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2 - X_i) + \xi \cdot I(X_i) \\ \text{s.t.} \quad & 0 \leq \tau_i \leq 1, \quad 0 \leq X_i \leq \bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2 \end{aligned}$$

By contrast, the policy under an egalitarian regime is:

$$\begin{aligned} \max_{c_i^*, X_i^*} \quad & u(c_i) + \xi \cdot I(X_i) \\ \text{s.t.} \quad & c_i + X_i = \bar{y} \end{aligned}$$

Assumption 1. *Fiscal distortion is not too low: $\eta > \frac{\bar{y}-y_p}{\bar{y}}$. Moreover the private consumption $u(c)$ is a function of constant relative risk aversion (CRRA), where the coefficient of relative risk aversion is greater than 1.*

The existence of fiscal distortion implies that the tax rate chosen by a median voter must be bounded away from 1. The second part of the assumption maintains that individuals tend to give more weight to the downside risk. Put another way, the marginal utility declines pretty fast when private consumption increases. These technical assumptions keep the model trackable without a loss of generality. The economic policy is as follows:

Proposition 1. *When the median voter is from group e or m , $X_i^* = \bar{y}\tau_i^* - \frac{\eta}{2}(\tau_i^*)^2$ and τ_i^* maximizes $u(y_i(1 - \tau)) + \xi I(X_i)$. When the median voter is from group p , there exists a threshold value ξ_p , such that when $\xi \leq \xi_p$, $\tau_i^* = \frac{\bar{y}-y_i}{\eta\bar{y}}$ and $\xi I'(X_i^*) = u'(c_i^*)$; when $\xi > \xi_p$, the policy platform is $X_i^* = \bar{y}\tau_i^* - \frac{\eta}{2}(\tau_i^*)^2$ and τ_i^* maximizes $u(y_i(1 - \tau)) + \xi I(X_i)$.*

When the elite or the middle class sets policies, the redistribution is zero, because the income of the median voter is above the mean. The total tax revenue will then be used to produce public goods. When the median voter is the poor, however, the policy depends on the trade off between redistribution to the poor and the value of public goods. When the marginal value of public goods is low ($\xi \leq \xi_p$), the poor prefer a positive amount of monetary transfer. Yet when public goods become sufficiently valuable, an increase in public goods leads to an utility gain larger than that from private consumption. In this case, even the poor prefer to spend all the revenue on public goods. The tax rate and the amount of public goods are different depending on who determines policies.

Remark 1. *When $\xi \geq \xi_p$, it is the case that $\tau_e^* > \tau_m^* > \tau_0^* > \tau_p^*$, where τ_0^* is the tax rate under the egalitarian regime.*

When all revenue is used to produce public goods, the marginal utility of public goods is equal to that of private consumption. Marginal utilities decrease in both private consumption ($u'(c) < 0$) and public goods ($I'(X) < 0$). Thus in equilibrium high investment of public goods is associated with large private consumption. An important implication is that rich voters care more about public goods than the poor do, as the increase of utility from private consumption for the rich is lower than for the poor. This suggests a main source of conflict between the rich and the poor. A related example is that left parties are usually against increase in defense spending. The defense budget was challenged by the Swedish Social Democrats in the early 20th century on the grounds that the military was 'an institution designed for the protection of the propertied upper classes' (Andersson, 1956: 409–410). In response to this opposition, Prime Minister Staaff canceled the plan for building new warships.

When $\xi < \xi_p$, since redistribution is positive under the rule of the poor, the tax rate may be higher than when set by the middle class and the rich. We use $U_i(\tau, X)$ to represent the sum of utilities from private consumption and public goods by each individual i . The relationship among individual utilities is as follows:

Remark 2. $U_p(\tau_p^*, X_p^*) > U_p(\tau_m^*, X_m^*) > U_p(\tau_e^*, X_e^*)$, and $U_e(\tau_e^*, X_e^*) > U_e(\tau_m^*, X_m^*) > U_e(\tau_p^*, X_p^*)$.

That is, both the rich and the poor prefer the rule of the middle class to that of the other group, with which their interests mostly conflict. The middle class serves as a middle ground, mediating the distributional conflict between the elite and the poor. Hence a concession of power to the middle class should be viable when the elite faces a high risk of being removed by revolutionary force. We can also show that the utility of the poor under the egalitarian regime is greater than that under universal suffrage. Thus the incentive to revolt always emerges when the chance of winning is high for the poor.

Remark 3. $U^0 > U_p(\tau_p^*, X_p^*)$.

As a last step toward analyzing the dynamic of suffrage extensions, we assume that the middle class is better off under universal suffrage than in the egalitarian regime. This is the case when ξ is relatively high and the investment in public goods decided by the poor is not very far from that determined by the middle class. As the amount of redistribution tends to be moderate, the middle class would prefer this to the equalization of wealth.

Assumption 2. $U_m(\tau_p^*, X_p^*) > U^0$, where U^0 is the one period utility of each individual under the egalitarian regime.

3.3. Extension of suffrage

The dynamics of the game start with the decision of the elite with regard to the extension of suffrage to the middle class. The strategy of the elite about extension is written as s , $s = 1$ if the elite extends suffrage, $s = 0$ if otherwise.

The middle class, once granted suffrage, may also decide to further extend suffrage to the poor immediately or in any period afterwards. If the middle class extends suffrage immediately, universal suffrage is implemented and policies are determined by the poor. If the middle class holds onto power for some periods and extends suffrage at a later time t' , the policy will be chosen by the poor from t' on. The strategy of the middle class is written as w , $w = 1$ stands for an extension to the poor, and $w = 0$, if otherwise.

In each period, the poor may decide on r : whether to revolt or not. If the poor revolts, then $r = 1$, otherwise $r = 0$. Rebellion incurs a fixed cost d for each individual. Obviously, when the cost of rebellion is too high, the poor refrains from rebelling and the elite does not have any incentive to extend. To focus on the situation where revolutionary threat is high, we assume the rebellion cost is located within a reasonable range. The imposed condition suggests that the poor will rebel if suffrage is not extended at all and that they will not rebel once granted suffrage. With some caveats,⁷ the simplification enables us to focus on the instrumental role of the middle class and how it changes interactions between the elite and the poor.

Assumption 3.
$$\frac{[U^0 - U_p(\tau_m^*, X_m^*)][U_m(\tau_m^*, X_m^*) - U_m(\tau_p^*, X_p^*)]}{U_m(\tau_p^*, X_p^*) - U^0} \leq d \leq \frac{q(u^0 - U_p(\tau_e, X_e))}{1 - \beta}$$

As introduced above, the parameter γ captures the potential efficacy of middle-class support for the elite. We assume γ is a time-varying random parameter independent of the state capacity to repress: γ_t . It follows a simple Markov process: $\gamma_{t+1} = \gamma_t + \epsilon_{t+1}$, where ϵ_{t+1} is an i.i.d. stochastic disturbance, $E(\epsilon_{t+1} | \gamma_t) = 0$ and $|\epsilon_{t+1}| \ll \gamma_t$. A positive ϵ_{t+1} suggests an exogenous shock, giving rise to an increase in the strength of the middle class. An interpretation of positive ϵ can be the prevalence of bourgeois values or economic liberalism, which was often coupled with the process of industrialization and rapid economic growth. A negative ϵ suggests a decrease in the strength of the middle class. This may be due to the development of labor unions as well as the formation of a proletarian identity when inequality increases (for example, Jones, 1991; Weyland, 2010).

The timing of events in period t is as follows:

- Nature draws γ_t . q and γ_t are commonly observed.
- The elite choose whether to extend suffrage to the middle class.
- If $s = 0$, the poor decide whether to rebel: $r \in \{0, 1\}$. If $r = 0$ then $\{\tau_e^*, X_e^*\}$ is implemented. If $r = 1$, with probability q , $\{\tau_e^*, X_e^*\}$ is implemented; with probability $1 - q$, an egalitarian regime is established and all individuals get U^0 .
- If $s = 1$, the middle class chooses whether to extend suffrage to the poor: $w \in \{0, 1\}$.
- If $w = 1$, the poor decides whether to rebel or not. $\{\tau_p^*, X_p^*\}$ is implemented if $r = 0$. Otherwise, the poor rebels and wins with probability $1 - q\gamma_t$. Policy platform is to be implemented as specified.
- If $w = 0$ and the poor does not rebel, $\{\tau_m^*, X_m^*\}$ is implemented. If the poor chooses to rebel, they win with probability $1 - q\gamma_t$. Policy platform is to be implemented as specified.
- The strategic interaction proceeds to next period unless an egalitarian regime is established.

The equilibrium concept is Markov Perfect Equilibrium (MPE). Current values for each player i depend only on the state variable. To be clear, economic policy is not a part of the strategy set. The player's strategies at time t are: $s_t \in \{0, 1\}$ for $i = e$, $w_t \in \{0, 1\}$ for $i = m$, and $r_t \in \{0, 1\}$ for $i = p$. The equilibrium of this game is the strategy profile $\{s_t, w_t, r_t\}$, which consists of a best response conditional on the state variable and the previous move in period t . The game is solved by backward induction. We first suppose that the elite has already extended suffrage to the middle class: $s_t = 1$. The result is summarized as follows:

Proposition 2. *Suppose the elite extends suffrage to the middle class in period t , there exist two threshold values, $q\bar{\gamma}$ and $\bar{q}\bar{\gamma}$, where $0 < q\bar{\gamma} < \bar{q}\bar{\gamma} < 1$, such that: when $q\gamma_t < q\bar{\gamma}$, the middle class does not extend the suffrage and the poor rebels; when $q\bar{\gamma} \leq q\gamma_t \leq \bar{q}\bar{\gamma}$, the middle class extends the suffrage to the poor and the poor does not rebel; when $q\gamma_t > \bar{q}\bar{\gamma}$, the middle class does not extend the suffrage and the poor does not rebel.*

Proposition 2 shows three possible cases when the middle class becomes incumbent. First, a revolution may still break out following a partial extension. This happens when

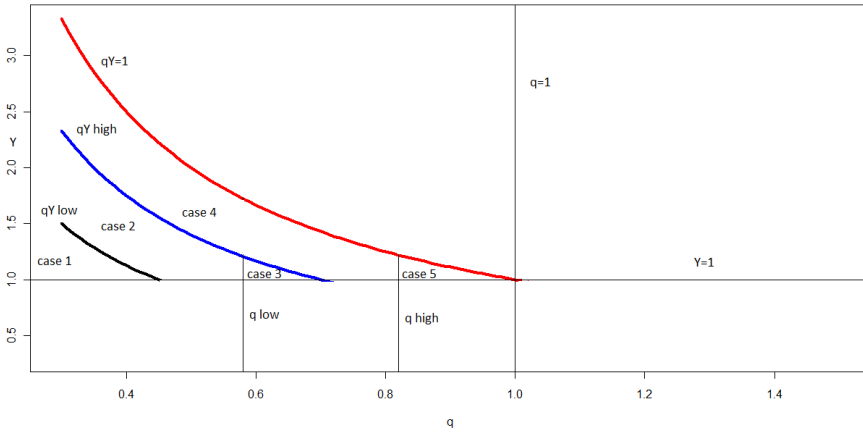


Figure 4. Reform and revolution in equilibrium. Case 1: The capacity of the ruling coalition is low, the elite extends suffrage to the middle class, the poor rebels; Case 2: The capacity of the ruling coalition is moderate, suffrage is extended to the poor, the poor does not rebel; Case 4: The capacity of the ruling coalition is high, the elite extends suffrage to the middle class, the middle class does not push reform further, and the poor does not rebel; Case 3 and Case 5: State capacity to repress is high and the middle class is relatively weak, the elite does not extend suffrage and the poor rebels.

the state capacity to repress is low and the middle class is not strong enough to contain revolution ($q\gamma_t < q\bar{\gamma}$). Secondly, when the strength of the ruling coalition is very high ($q\gamma_t > q\bar{\gamma}$), the dominance of the middle class is maintained. Lastly, when the strength of the ruling coalition is located within some middle range ($q\bar{\gamma} \leq q\gamma_t \leq q\bar{\gamma}$), the middle class concedes suffrage to the poor. The next proposition provides a complete profile of all strategic interactions, including the choice of the elite.

Proposition 3. Suppose that at the beginning of time t only the elite has suffrage, in an MPE: (1) when $q\gamma_t < q\bar{\gamma}$, then $s_t = 1$, $w_t = 0$ and $r_t = 1$; (2) when $q\bar{\gamma} \leq q\gamma_t \leq q\bar{\gamma}$ and $q < \bar{q}$, then $s_t = 1$, $w_t = 1$ and $r_t = 0$; (3) when $q\bar{\gamma} \leq q\gamma_t \leq q\bar{\gamma}$ and $q \geq \bar{q}$, then $s_t = 0$ and $r_t = 1$; (4) when $q\gamma_t > q\bar{\gamma}$ and $q < \bar{q}$, then $s_t = 1$, $w_t = 0$ and $r_t = 0$; (5) when $q\gamma_t > q\bar{\gamma}$ and $q \geq \bar{q}$, then $s_t = 0$ and $r_t = 1$. Here \underline{q} and \bar{q} are two threshold values of q and $0 < \underline{q} < \bar{q} < 1$.

Intuitively, adding the incentive conditions of the elite tends to increase the difficulty of changing the status quo, particularly when state capacity to repress is high. When the elite anticipates that the poor is not going to be impeded, the choice is between fighting against the poor alone and fighting with the help of the middle class, notwithstanding with some policy concessions. This is consistent with case (1) in Figure 4, where the capacity of the ruling coalition is low in repression. In contrast, when state capacity to repress is high and the support of the middle class is weak, such as in cases (3) and (5), the utility of including the middle class is small for the elite. Suffrage is not extended,

although it is quite possible that the middle class would have been willing to pursue reform further, had they had power to decide. cases (2) and (4) correspond to relatively peaceful transformations towards broader political participation. Such changes are facilitated by a middle class that has enough social and economic prowess to shift the result of fights. Partial suffrage is maintained, and the political dominance of the middle class lasts over time, when the strength of the ruling coalition falls in the highest parameter range as identified by case (4). When the power of the poor surges, sooner or later, suffrage will be finally conceded when the strength of the ruling coalition collapses as in (2). This is how suffrage expands dynamically.

Case (1) represents historical cases in which bureaucratic apparatus for repression was weak and the threat of revolutionaries was urgent. The elites conceded power to preserve a broad ruling coalition with the middle class. France in 1848 and in 1871 belongs to such a group. The reform to introduce universal male suffrage for Constituent Assembly elections in 1848 clearly had a motivation of allying the republican bourgeoisie, which forcefully defended the status quo of 'property, family, religion, order' in the fights against workers (Marx, 1964 [1850]: 63). In 1871, Napoleon III's regime collapsed following his defeat in the Franco-Prussian War. The provisional government by monarchical elites was unable to garner adequate popular support, and the strength of the Paris Commune was on a rising trend. It was in this context that the Republican bourgeoisie came into power with 'a convergence of forces at the political center' following legislative elections (Collier, 1999: 43). While the suppression of the Paris Commune by Thiers's government took place a few weeks before the elections, the political dominance of the middle class was part of a grand bargaining within the ruling class. The control of Republicans was then key for the political stability of the Third Republic (Mooers, 1991).

Case (4) is consistent with historical cases in which partial suffrage was maintained. Britain and Sweden during the 19th century are such cases. Public support for the national governments in these countries was strong, and the middle class had significant influence on policy agendas (Andersson 1956). Chartism, the biggest social movement in England in the 19th century, never became a real threat to the state. The leadership of Chartists was split on many issues, from the goals of the movement to decisions about general strikes (Jones, 1991; Foot, 2005). Thanks to economic growth and a high state capacity, the ruling coalition of the elite and the capitalist middle class was quite successful in neutralizing social conflicts. In Sweden, where agricultural capitalists constituted an influential group, workers did not have a decisive role in the adoption of reforms (Collier, 1999).

A transition from partial to universal suffrage in case (2) may be caused by negative shocks to $q\gamma$, or a reduction in the ruling coalition's ability to impose its rule over the poor. Again, in Britain and Sweden, electoral reforms were pushed by the Labor Party and by the Social Democratic Party. Another important factor pressing for reforms later in the 20th century may have been the granting of universal suffrage by the Soviet Union. The concern about the diffusion of Communism is reflected in Lloyd George's remark from 1917:

In Russia, they pointed out, the workmen formed a separate authority, coordinated with the Government. There, they were more powerful than their peers in England. Their veto was

effective in the administration as well as in the legislative sphere. They dominated the military activities of the nation. Why not in Britain? That was the question asked in every workshop and on every street corner.

(Foot, 2005: 244)

By a similar token, the relative weakness of the ruling coalition might be one reason for the adoption of universal suffrage in newly independent countries (e.g. Austria, Czechoslovakia, Hungary, and Finland).

Lastly, cases (3) and (5) are characterized by political repression and fierce social conflicts. The best example might be the Russian Revolution. The stagnation of political reform was due to both repression and the lack of a powerful middle class. The State Duma failed to adopt substantial reforms that might mediate conflicts after the Revolution of 1905. Instead of seeking a coalition with the middle class, the regime relied on the police to perform arrests and executions, leading to the collapse of the regime in 1917 (Pipes, 1996).

3.4. Comparative statics

Although the equilibrium scenarios regarding the dynamic of suffrage expansions are determined by the strength of contesting groups, the threshold values are a function of individual utilities under different policy platforms. Given state capacity and the strengths of groups, the likelihoods of conflicts and reform vary according to individual utilities. For the purpose of this paper, we assume now that suffrage has been extended to the middle class. The relatively narrow focus on partial suffrage helps us analyze the interaction between economic conditions and political change in the late 19th and early 20th centuries. The range of parameter conditions consistent with case (1), social revolutions under the rule of the middle class, is proportional to $q\gamma$; similarly, the range of parameter conditions for case (4), peace with partial suffrage, is proportional to $1 - \overline{q\gamma}$.⁸

Remark 4. *Suppose only the elite and the middle class have suffrage, revolution is more likely when the difference between U^0 and $U_p(\tau_p^*, X_p^*)$ increases; partial suffrage with peace is more likely when the difference between U^0 and $U_p(\tau_m^*, X_m^*)$ decreases; and the likelihood of universal suffrage increases in $U_p(\tau_p^*, X_p^*)$ and decreases in $U_p(\tau_m^*, X_m^*)$ and U^0 .*

Intuitively, when the poor anticipate a large gain from a successful revolution, the threshold value $q\gamma$ tends to be high. This implies an expansion of case (1): the scenario of social revolutions. For example, the unrest in France 1848 can be partly attributed to workers' high expectations for social welfare following revolutions. When universal male suffrage was implemented during the Second Empire in later years, state capacity had been consolidated (large $q\gamma$) and there had already been considerable improvement in workers' economic conditions. The nominal wage of Parisian workers doubled during the second half of the 19th century (Moss, 1976). Compared with the stagnation of workers' wage before the 1850s, this should imply a large improvement in the standard of living. By contrast, when the utility of the poor under universal suffrage is high relative to that under the rule of the middle class, the range of parameters inducing universal suffrage is

accordingly broad. When there is little difference between $U_p(\tau_p^*, X_p^*)$ and $U_p(\tau_m^*, X_m^*)$, the region $q\gamma \in (q\gamma, \overline{q\gamma})$ shrinks and the transition to universal suffrage tends to come later. This logic helps explain the relative stability of more industrial countries such as Britain, France, and Switzerland during the interwar period. Luebbert (1991: 191) identifies in these countries an ‘essential continuity as liberal political economies’ as well as a feature of ‘market-oriented, middle-class dominated democracies.’ A cause of the dominance of the middle class might have been the congruence between liberal economic policies and the interest of the poor. In the language of the model, this suggests that $U_p(\tau_m^*, X_m^*)$ is pretty close to $U_p(\tau_p^*, X_p^*)$, and thus there was not much stake for the poor to fight.

The conclusion of the model can be extended to adapt to other economic conditions we have not considered so far. For example, in our model, the income of the middle class is higher than the mean, and redistribution under the rule of the middle class is zero. Suppose otherwise, the middle class’ income is lower than the mean. The new specification suggests that redistribution may be positive for some ξ , and because of this, the difference between $U_p(\tau_m^*, X_m^*)$ and $U_p(\tau_p^*, X_p^*)$ may be less in relative terms. When this is the case, the threshold value $\overline{q\gamma}$ should be smaller as should the region $q\gamma \in (q\gamma, \overline{q\gamma})$. The result is a relatively broad range of parameter conditions for partial suffrage with peace, or, a more stable rule of the middle class.

We also investigate the relationship between two economic variables: the value of public goods and the income of the poor, on social conflicts. The results presented below provide a motivation for the empirical test in the next section.

Remark 5. *When the value of public goods, ξ , increases, $\underline{q\gamma}$ becomes larger.*

A high demand for public goods leads to a large $\underline{q\gamma}$ and high pressure of social revolution. This is because the utility for the poor under the egalitarian system increases faster than under universal suffrage. Under the egalitarian system, there is no redistribution of income, and any increase in ξ is directly transformed into a utility gain via public goods. This makes revolution more desirable and shifts the threshold curve $q\gamma = \underline{q\gamma}$ upward. In turn, the strength of the ruling coalition may need to be higher in order to contain the threat of revolutionaries. The result provides an account for social conflicts in the process of modern state formation. Various scholarly works suggest that the risk of conflicts increases when states fail to provide enough of public goods, such as law enforcement, public health, and public transportation. For example, one source of political instability in Britain during the 1820s was the social problems following the Napoleonic Wars, such as the disposing of military arms and the caring for the war-disabled (Tilly, 1995).

Remark 6. *Suppose $\xi > \xi_p$, when y_p increases, $\underline{q\gamma}$ decreases.*

In our model the income of the poor, y_p , is the median income of the society. Other things being equal, the increase of y_p leads to a higher ratio between the median and mean incomes, or a reduction in income inequality. A straightforward interpretation about this is that societies are less vulnerable to conflicts when income distribution is more equal. Moreover, countries with more equal income distribution tend to adopt universal suffrage early, since the threshold curve $q\gamma = \underline{q\gamma}$ is low and the poor do not have a strong incentive to revolt. This result is consistent with a large body of literature showing a positive relationship between conflicts and inequality (Acemoglu and Robinson, 2000; Collier and Hoeffler, 2004; Houle, 2009).

4. Empirical evidence

4.1. Hypotheses and data

We now turn to empirical evidence, and use cross-country data to test some implications of the model. We focus on the determinants of social conflicts, and particularly, whether suffrage extensions and other economic and political factors had significant impacts on conflicts within a society.⁹ As the model suggests, various results might arise in equilibrium. There might be cases where suffrage is extended and conflicts continue (region (1)), cases where suffrage is not extended and conflicts continue (regions (3) and (5)), and cases where suffrage is extended and conflicts are appeased (regions (2) and (4)). Without any prior distribution about the strengths of groups and income distribution, it is impossible to tell which cases are more likely to prevail. A priori, we should not expect extensions of suffrage to have a significant positive or negative effect on social conflicts.

By contrast, state capacity to repress should have a large effect on rebellious activities. This intuition is readily illustrated by Figure 4. When the strength of the middle class is high, the increase in state capacity to repress (q) tends to move equilibrium scenario from region (1) to region (2). So, high state capacity thwarts conflicts. When the strength of the middle class is relatively low, the increase in state capacity to repress may first reduce conflicts; however, a further increase in q may lead to region (3) and (5), in which the elite does not extend because of its capacity for repression. Combining the two effects together, we have reason to expect that the relationship between state capacity to repress and conflicts is non-monotonic: the first order effect is negative, and the second order effect is positive. In other words, rebellions tend to happen when state capacity is very low or very high. This reasoning produces the first hypothesis to be tested empirically.

Hypothesis 1: *The relationship between state capacity to repress and rebellious activities is non-monotonic: the first order effect of state capacity is negative, and the second order effect is positive.*

The strength of the middle class also has a large effect on impeding social conflicts. When suffrage is restricted to the elite, a strong middle class (high γ) is associated with peace because of a strong ruling coalition. Under the rule of the middle class, positive shocks to γ enhance the chances of transition from equilibrium scenarios with conflicts (region (1)) to ones with peace (regions (2) and (4)). We hypothesize a negative relationship between the strength of the middle class and rebellions.

Hypothesis 2: *The strength of the middle class has a negative effect on rebellious activities.*

The comparative static presented in the preceding section provides a basis for examining other factors affecting social conflicts. The model predicts that a high demand for public goods is associated with a large threshold curve $q\gamma = \underline{q\gamma}$ and more rebellious activities. The result is related to the research on contentious politics in modern state formation (Tilly, 1995; Tilly and Tarrow, 2007). The following hypothesis is thereby motivated.

Hypothesis 3: *An increase in the demand for public goods tends to increase rebellious activities.*

Following previous empirical work on the relationship between suffrage extensions and rebellions (Przeworski, 2009), we use a measure of social unrest based on Banks (1996) as a proxy of rebellious activities. The dependent variable, *unrest*, is the sum of general strikes, demonstrations, and riots in each country-year between the end of World War I and 1995.¹⁰ This measure intends to capture the degree of social instability caused by distributional conflicts. Admittedly, the imperfectness of the measure as a proxy of rebellious activities may limit the power of our empirical test. For example, data are available only for the post-World War I period. Due to the lack of data on social conflicts for earlier time, we cannot conduct empirical tests of the theory systemically based on the history of the 19th century. We nonetheless rely on Banks's data for more recent history, as it covers the socioeconomic conditions mostly widely seen around the world. Moreover, the data on suffrage extensions, to be discussed shortly, provides rich variations in both the timing and types of extensions undertaken during the 20th century in Europe, Latin America, Africa, and other parts of the world. Hence, the empirical work here should not be considered a direct test of the explanation for suffrage extensions in Europe during the 19th century, but rather as complementary evidence consistent with the theory motivated by a few historical cases in the European history.

The first set of independent variables concerning extensions of suffrage comes from the data set 'Political Institutions and Political Events (PIPE)' constructed by Przeworski (2009, 2011). The data provides a documentation of restrictions on the right to vote in national elections for all countries worldwide since 1800. The qualifications for the right to vote are represented by a two-digit variable, where the first digit characterizes restrictions along the class line and the second digit characterizes restrictions along the gender line.¹¹ Przeworski codes the restrictions along the class line according to a 1–7 category, where an ascent in the categorical rank (e.g. from 5 to 7) represents an extension of suffrage to populations of lower income and social status. We use these data to construct three measures about the extension of suffrage. First, we assume any increase in the first digit to be a case of extension for males (*extension_male*). This gives us 67 cases of extension along class lines worldwide during the post-World War I years. Second, any increase in the first digit is considered a partial extension (*extension_partial*) if the new value is less than 7 (right to vote for all adult males). Last, a case is qualified as the adoption of universal suffrage (*extension_universal*) if the first digit increases to 7. The construction of the variables excludes extensions made specifically to women, but it does not rule out cases where extensions were intended for both men and women.

The second set of independent variables we include is the proportion of military personnel within a country and its square term. The variables are intended to capture the non-monotonic effect of state capacity to repress addressed by Hypothesis 1. While it is certainly true that the size of population serving in the military does not directly measure repression by a state, the number gives us an intuition about how much coercive power the state is able to deploy. Moreover, the proportion of military personnel may also reflect the effects of war mobilization. We have reasons to suspect that a high degree of war mobilization is positively correlated with an efficient bureaucratic apparatus and high public support for a regime, among other things.¹²

We also use the growth rate of per capita income (*growth*) computed by Maddison (2003) as an independent variable throughout all models. We interpret the variable as a proxy for two socioeconomic conditions: the strength of the middle class and increases

Table 1. Summary statistics: 1920–1995.

Variable	Mean	Std.Dev.	Min	Max	Expected Effect	Hypotheses
Unrest	1.070	3.032	0	49	NA	NA
Extsion_partial	0.001	0.035	0	1	0	NA
Extsion_universal	0.006	0.077	0	1	0	NA
Extsion_male	0.007	0.084	0	1	0	NA
Military	0.669	0.757	0	4.844	first negative, second positive	1
Growth	0.018	0.066	-0.615	0.850	negative	2
GDP_per_capita	3.827	4.029	0.299	30.93	NA	NA
Urbanization	2.832	1.900	0	12.26	positive	3

Notes: The summary statistics are obtained from the sample of all independent countries worldwide between 1919 and 1995. The variable *Unrest* indicates the number of demonstrations, riots and strikes in each country-year, for which the years between 1940 and 1945 are coded as missing. Both *Military* and *Urbanization* are measured in percentages (%). The sample mean for the proportions of militants over the whole population is 0.6685%. The variable *Growth* measures the growth rate of per capita GDP, which is a decimal.

in the income of the poor. We do not go as far to claim that economic growth necessarily nurtures a strong group of middle class; however, it is reasonable that gains from economic growth do promote the political power of groups that have benefited economically (Becker, 1983; North, 1991; Temple and Johnson, 1998; Banerjee and Duflo, 2008). The influence of the middle class might also be correlated with the political participation of new groups and the thriving of liberal ideology. At the same time, economic take-off in developing countries generally leads to rapid increases of the poor's income. So economic growth neutralizes distributional conflicts and reduces the incentive to rebel. Combining the two effects together, we expect that the growth rate of per capita income has a negative effect on *unrest*.

Lastly, we follow Przeworski (2009) to include *urbanization* as an index for the demand of public goods. The variable is equal to the proportion of the population living in cities of 25,000 or more. The theory suggests that social conflicts might be more frequent when the need for public goods is crucial. The variable may also capture the degree of income inequality, since cities often absorb a mass of poor workers. We expect *urbanization* to have a positive effect on *unrest*. Table 1 provides a statistical summary of the variables, their expected signs, and the corresponding hypotheses they are intended to be test for.

4.2. Model specification

We estimate the following linear model of the determinants of rebellious activities. The dependent variable, *Unrest*, is the amount of social unrest (sum of riots, demonstrations and strikes) in country *i* during year *t*. The set of independent variables includes suffrage extensions during year *t* - 1, along with the other variables (X_{it}) discussed above: the proportion of military personnel and its square term, the growth rate of per capita GDP, and the degree of urbanization. The use of one-year lagged variables for extensions takes care of identification problems when suffrage extensions occurred after unrest. In

that case, the estimates for the effect of extensions are negatively biased. u_i is an unobserved country fixed effect, which we assume to be correlated with the regressors (that is, $E(\epsilon_{it}|X_{it}, u_i) = 0$ and $cov(X_{it}, u_i) \neq 0$). Fixed effects address the endogeneity caused by country-specific factors. For example, it might be the case that both extensions and conflicts are more frequent than average in certain countries due to ethnic heterogeneity.

$$Unrest_{it} = \alpha_0 Unrest_{i,t-1} + \alpha_1 Suffrage_{i,t-1} + X_{it}\beta + u_i + f(t) + \epsilon_{it}$$

At the same time, we include the lagged dependent variable on the right-hand side to address the time-dependence of social conflicts. The use of lagged dependent variable and fixed effects at the same time potentially lead to inconsistent estimates, as the lagged dependent variable and the disturbance term ϵ_{it} are correlated. The correlation becomes sufficiently small when T is larger than 30 (Greene, 2008). So this does not pose a serious identification problem in our case. The Hausman test for all specifications rules in favor of fixed effects.

Obviously, decisions to extend suffrage were endogenous. The estimates for suffrage extensions might be biased in several ways. First, more democratic countries tended to extend suffrage early and had broader voting rights than autocratic counterparts. More liberalized states also implement fewer restrictions on media and allow more coverage of unrest. The unobserved effects due to information suppression lead to a downward bias for the coefficients about suffrage extensions. This type of endogeneity is country-specific and addressed by fixed effects. Secondly, the adoption of universal male suffrage was sometimes induced by idiosyncratic factors, such as independence and war mobilization. Historically, social conflicts tended to be contained following a consolidation of political power in newly independent countries. This actually works against our hypothesis since states often extended suffrage immediately after independence. Thirdly, the model may be biased to the extent that the effect of universal suffrage is underestimated, since now suffrage cannot be extended further afterwards. To address the problem, we use from the data set PIPE a categorical variable 'first digit', which is a 1–7 index addressing restrictions on suffrage, as a measure of the extent of suffrage. Under this alternative specification, a large value of categorical variable indicates a broad extent of suffrage.

There are reasons to suspect that military power is endogenous. One possibility for endogeneity comes from the simultaneous increase in military personnel and government expenditure following war mobilization. The expansion of military expenditure has crowding-out effects on social welfare and public goods, adding to the potential of social unrest. To deal with the endogeneity related to military power, we use the lagged two-period variables for military power as instrumental variables. When including the categorical variable about suffrage, we also use the corresponding lagged variables as instruments. The identification assumption is that these lagged independent variables are correlated to $Military_{it}$, but uncorrelated to ϵ_{it} . Formally, the first stage equations for instrumented variables are:

$$Military_{it} = b_0 + b_1 Military_{i,t-1} + b_2 Military_{i,t-2} + b_3 Military_{i,t-1}^2 + b_4 Military_{i,t-2}^2 + Z_{it}d1 + \sigma_{it}$$

$$Military_{it}^2 = c_0 + c_1 Military_{i,t-1} + c_2 Military_{i,t-2} + c_3 Military_{i,t-1}^2 + c_4 Military_{i,t-2}^2 + Z_{it}d2 + e_{it}$$

where $cov(\epsilon_{it}, \sigma_{it}) \neq 0$, $cov(\epsilon_{it}, e_{it}) \neq 0$, $cov(\epsilon_{it}, \sigma_{i,t-1}) = 0$, $cov(\epsilon_{it}, \sigma_{i,t-2}) = 0$, $cov(\epsilon_{it}, e_{i,t-1}) = 0$, and $cov(\epsilon_{it}, e_{i,t-2}) = 0$.

4.3. Results

Table 2 presents the results of linear panel regressions for rebellious activities. The results strongly support the hypotheses. First, from columns 1 to 4 in the table, the coefficients concerning suffrage extensions are statistically insignificant. Secondly, military power of the state (*Military*) has a non-monotonic and statistically significant effect on rebellious activities. While the first order effects are positive, the coefficients of square terms are negative. Thirdly, *Growth* is a strong and significant predictor of the decrease in rebellious activities. The result suggests that economic progress helps appease rebellious activities by creating a strong middle class and by neutralizing distributional conflicts. Fourthly, countries with a high degree of urbanization tend to have more unrest. As the theory suggests, the incentive of the poor to rebel is magnified when the need for public goods is high, which is often the case in the process of urbanization.

Table 3 reports the results from instrumental variable estimates. As discussed above, the individual effects correlated with *Military* may work against our hypothesis and create positive biases. We expect the coefficients for *Military* in instrumental variable estimates to be at least as large as those in the previous table. The results in Table 3 confirm this intuition. For the first order effect, the absolute values of coefficients increase and the significance of them increases. The square terms remain at similar significance levels and coefficients.

In columns 1 and 2 of Table 3, the extension of suffrage is not treated as endogenous because the lagged variable is not an appropriate instrument.¹³ The effects of suffrage extension remain insignificant when *Military* and its square term are instrumented. Neither result indicates a negative effect of suffrage extension on unrest. In column 3, we use the categorical variable concerning the restrictions on suffrage as an alternative measure and the two-period lagged variables as instruments. While the coefficient becomes negative, this effect is very small and statistically insignificant. The instrumental variable estimates do not produce different results for the coefficients of *Growth*, *GDP per capita*, and *Urbanization*. Both the coefficients and significance levels are similar to Table 2. The introduction of instrumental variables either strengthens or does not change the predictions with respect to rebellious activities. Both linear regressions and instrumental variable estimates provide evidence consistent with the claim that conflicts are deterred by the capacity of the ruling groups, but not necessarily by reforms that extend suffrage.

5. Conclusion

The extension of suffrage is not only a concession to the poor, but often a strategic choice made by elites coping with revolutionary threats. Historically, extensions of suffrage were often followed by violent social conflicts rather than peace. The phenomenon poses a puzzle about the effects of political reform on revolution. As Tocqueville famously described in *The Ancien Regime and the French Revolution*: ‘The regime that revolution destroys is almost always better than the one that immediately preceded it, and experience teaches that the most dangerous time for a bad government is usually when it begins to reform’

Table 2. Determinants of social unrest (1920–1995).

	(1)	(2)	(3)	(4)
Lag Unrest	0.381 (0.011)***	0.303 (0.017)***	0.303 (0.017)***	0.305 (0.017)***
Lag Extension_male	0.259 (0.464)	0.531 (0.553)		
Lag Extension_partial			1.208 (2.386)	
Lag Extension_universal			0.493 (0.568)	
Lag First Digit			-0.056 (0.085)	0.022 (0.106)
Military		-0.626 (0.268)**	-0.627 (0.268)**	-0.624 (0.268)**
Military ²		0.143 (0.067)**	0.143 (0.067)**	0.142 (0.067)**
Growth		-3.135 (0.736)***	-3.129 (0.736)***	-3.144 (0.736)***
GDP_per_capita		-0.037 (0.036)	-0.038 (0.035)	-0.036 (0.037)
Urbanization		0.175 (0.084)**	0.174 (0.084)**	0.172 (0.084)**
Time trend		0.007 (0.006)	0.007 (0.006)	0.007 (0.006)
Constant	0.666 (0.032)***	0.482 (0.195)**	0.483 (0.195)**	0.349 (0.702)
N	6786	3329	3329	3329
F-statistics	556.61	58.92	51.75	46.00
R ² — within	0.14	0.11	0.11	0.11
R ² — between	0.98	0.65	0.73	0.73

Notes:

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

All the results are estimated by linear panel regression with country fixed effects. Standard errors in the parentheses.

(Tocqueville, 2011 [1856]: 157). We contend this view by arguing that the rulers would not have expected a better outcome by adopting a hard-line stance. Moreover, the research on the introduction of inclusive political institutions can benefit from the perspective of the role occupied by the middle class.

We analyze the process of suffrage expansion as a dynamic game among three players. The elite may either hold on to power or extend political rights to the middle class in the face of a revolutionary threat presented by the poor. The interests of the elite and the middle class are preserved by the increase in state capacity to repress that follow an extension. However, the middle class may have divergent interests from the elite and extend

Table 3. Determinants of social unrest: Instrumental variables (1920–1995).

	(1)	(2)	(3)
Lag Unrest	0.276 (0.017)***	0.276 (0.017)***	0.278 (0.016)***
Lag Extension_male	0.854 (0.572)		
Lag Extension_partial		1.146 (2.342)	
Lag Extension_universal		0.834 (0.590)	
Lag First Digit			-0.063 (0.119)
Military	-0.764 (0.296)***	-0.765 (0.297)***	-0.748 (0.297)**
Military ²	0.168 (0.077)**	0.168 (0.077)**	0.164 (0.077)**
Growth	-3.552 (.747)***	-3.637 (0.751)***	-3.672 (0.751)***
GDP_per_capita	-0.019 (0.037)	-0.019 (0.037)	-0.023 0.038
Urbanization	0.179 (0.085)**	0.181 (0.085)**	0.185 (0.086)**
Time trend	0.006 (0.006)	0.006 (0.006)	0.007 (0.006)
Constant	0.524 (0.199)**	0.523 (0.200)**	0.929 (0.783)
N	3175	3175	3175
χ^2	1158.61	1154.06	1151.32
R ² — within	0.11	0.11	0.10
R ² — between	0.65	0.65	0.65

Notes:

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

All results are estimated with country fixed effects. *Military*, *Military*², and the variable with respect to suffrage are treated as endogenous with the two-periods lagged variables being used as the instrumental.

suffrage to the poor. The path toward universal suffrage is determined by fluctuations in the power of the ruling coalition, along with other economic variables.

The model establishes several results that are not previously addressed in the literature but consistent with empirical evidence: rebellions may still occur following an extension of suffrage to the middle class; there might be a transition from revolution to universal suffrage following the increase in state capacity; the rule of the middle class may persist in countries extending early because of relatively small gains from revolutions. We also test the theory using cross-country data for more recent history. The empirical findings confirm our argument that domestic peace does not necessarily follow

from extensions. The results also show that military power, economic growth, and the degree of urbanization each have a strong impact on social conflicts.

Although this paper is primarily motivated by historical cases, the logic parallels the theories on democratization and authoritarian regimes in the contemporary period. In order to maintain political survival, authoritarian rulers today often share political power with legislatures, bureaucracies, and the military (O'Donnell, 1973; Gandhi and Przeworski, 2006; Magaloni, 2008; Svobik, 2009, 2013). Transitions to democracy are likely when some groups within the ruling coalitions find an interest in changing the political status quo and force authoritarian rulers to give up power. Examples can be found in Peru in 1977, Spain under Adolfo Suárez, and El Salvador in 1991, in which a common feature is that some factions of the ruling coalition came to support political liberalization (Collier, 1999; Wood, 2000). Both the mechanism of democratization and the establishment of universal suffrage entail a strategy of coalition-building as opposed to sheer repression. The rulers did not miscalculate, however, reform and revolution may have nonetheless come hand in hand.

Appendix I: Proof

The next lemma will be used in the proof.

Lemma 1. *When $i = p$, for each value $\tilde{\tau} = \frac{\bar{y}-y_p}{\eta\bar{y}}$, there always exists an \tilde{X} such that:*

$$c_p + \tilde{X} = y_p(1 - \tau_i) + \bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2, \text{ and}$$

$$\xi I'(\tilde{X}) = u'(c_p).$$

And \tilde{X} increases in ξ .

Proof. When the tax rate $\tau = \tilde{\tau}$ is given, the problem of $i = p$ is to maximize $u(c_p) + \xi I(X_p)$, subject to $c_p + X_p = y_i + (\bar{y} - y_i)\tau - \frac{\eta}{2}\bar{y}\tau^2 > 0$. So $u'(c_p) = \xi I'(X_p)$ follows from the first order condition. The monotonicity is proved through the implicit function theorem. Differentiate $\xi I'(\tilde{X}_i) = u'(c_i)$ with respect to ξ , and by rearranging we get $\frac{\partial X_i}{\partial \xi} = -\frac{I'(X_i)}{\xi I'(X_i) + u'(c_i)}$, which is always positive. \square

Proposition 1

Proof. Construct the Lagrangian as $L = u(y_i(1 - \tau_i) + \bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2 - X_i) + \xi \cdot I(X_i) + \lambda_1 \tau_i + \lambda_2 X_i + \lambda_3(\bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2 - X_i)$. When $i = m, e$, there are two cases: $X_i = \bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2$, $\lambda_1 = \lambda_2 = 0$, or $\tau_i = X_i = 0$. Since $I(0) = -\infty$, the solution is to invest all tax revenue in public goods. The first order condition in the case is $y_i u'(c_i) = \xi I'(X_i)(\bar{y} - \eta\bar{y}\tau)$. When $i = p$, solving the lagrangian obtains four cases:

(1) $\tau_i^* = 0$, and $X_i^* = 0$, there is no taxation. Each individual obtains $U(y_i)$.
 (2) $\tau_i^* = \frac{\bar{y}-y_i}{\mu\bar{y}}$, and $X_i^* = 0$, there is some tax and no investment in public goods. Each individual obtains $u(y_i + \frac{(\bar{y}-y_i)^2}{2\mu\bar{y}})$.

(3) $\tau_i^* = \frac{\bar{y}-y_i}{\mu\bar{y}}$, and $\xi I'(X_i^*) = u'(c_i)$.

(4) $X_i^* = \bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2$, and $\tau_i^* = \arg \max u_i(\tau, X_i^* | X_i^* = \bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2)$.

The first two cases are impossible because $I(0) = -\infty$. Let ξ_p be the value of ξ such that $\{X_i | \tilde{\tau} = \frac{\bar{y}-y_i}{\eta\bar{y}}, u'(c_i) = \xi I'(X_i)\} = \bar{y}\tilde{\tau} - \frac{\eta}{2}\bar{y}\tilde{\tau}^2$. First, when $\xi \leq \xi_p$, from **Lemma 1**

we know $\{X_i|\bar{\tau} = \frac{\bar{y}-y_i}{\eta\bar{y}}, u'(c_i) = \xi I'(X_i)\} \leq \bar{y}\bar{\tau}_i - \frac{\eta}{2}\bar{y}\bar{\tau}_i^2$. This is the local optimum as in the first case. The policy $X_i = \bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2$ and $\xi I'(X_i) = \frac{y_i}{\bar{y}(1-\eta\tau_i)}u'(c_i)$ is equivalent to a special case of the optimization of the first case imposed an additional constraint: $X_i = \bar{y}\tau_i - \frac{\eta}{2}\bar{y}\tau_i^2$. So the utility from the second case is no greater than that from the first case. When $\xi > \tilde{\xi}$, **Lemma 1** implies $\{X_i|\bar{\tau} = \frac{\bar{y}-y_i}{\eta\bar{y}}, u'(c_i) = \xi I'(X_i)\} > \bar{y}\bar{\tau}_i - \frac{\eta}{2}\bar{y}\bar{\tau}_i^2$. $\bar{\tau}_i = \frac{\bar{y}-y_i}{\eta\bar{y}}$ and $\xi I'(\bar{X}_i) = u'(c_i)$ are not available. Construct a new policy pair $\{\tilde{\tau}_i = \frac{\bar{y}-y_i}{\eta\bar{y}}, X'_i = \bar{y}\tilde{\tau}_i - \frac{\eta}{2}\bar{y}\tilde{\tau}_i^2\}$. Write $h(X_i) = \xi I'(X_i) - u'(c_i)$, when τ_i is constant, $h'(X_i) < 0$. Thus the agent's utility is concave in X_i . Since $X'_i < \bar{X}_i$, and X'_i is the highest amount of X_i given the constraint $X_i \leq \bar{y}\tilde{\tau}_i - \frac{\eta}{2}\bar{y}\tilde{\tau}_i^2$, the policy $\{\tilde{\tau}_i, X'_i\}$ obtains the highest utility for i under the given constraint. But then the utility given by $\{\tilde{\tau}_i = \frac{\bar{y}-y_i}{\eta\bar{y}}, X'_i = \bar{y}\tilde{\tau}_i - \frac{\eta}{2}\bar{y}\tilde{\tau}_i^2\}$ is less than that from $\{X_i = \bar{y}\tau - \frac{\eta}{2}\bar{y}\tau_i^2, \xi I'(X_i) = \frac{y_i}{\bar{y}(1-\eta\tau_i)}u'(c_i)\}$. \square

Remark 1

Proof. When $\xi \geq \xi_p$, for $i = e, m, p$ and $y_i = y^0$, the optimal policy is decided by $y_i u'(y_i(1 - \tau)) = (\bar{y} - \eta\bar{y}\tau)\xi I'(\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2)$. Take derivative with respect to y_i , rearranging we get: $\frac{d\tau}{dy_i}[-\eta I'(X_i) + (1 - \eta\tau)^2 \tau^2 I'(X_i)\xi + y_i^2 u'(c_i)] = u'(c_i) + c_i u'(c_i)$. That $-\eta I'(X_i) + (1 - \eta\tau)^2 \tau^2 I'(X_i)\xi + y_i^2 u'(c_i) < 0$ is obvious. When **Assumption 1** holds, $-c_i \frac{u'(c_i)}{u'(c_i)} > 1$. So $u'(c_i) + c_i u'(c_i) < 0$. It follows that $\frac{d\tau}{dy_i} > 0$, so $\tau_e > \tau_m > \tau^0 > \tau_p$. \square

Lemma 2. When $\xi < \xi_p$, τ_e^* is greater than τ'_e , where τ'_e solves $y_p u'(y_p(1 - \tau)) = (\bar{y} - \eta\bar{y}\tau)\xi I'(\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2)$.

Proof. When $\xi < \xi_p$, the poor will choose $\tau_p^* = \frac{\bar{y}-y_p}{\eta\bar{y}}$. We want to show that $\tau_p^* > \tau'_p$, where τ'_p solves $y_p u'(y_p(1 - \tau)) = (\bar{y} - \eta\bar{y}\tau)\xi I'(\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2)$. Let $F(\tau) = y_p u'(y_p(1 - \tau)) - (\bar{y} - \eta\bar{y}\tau)\xi I'(\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2)$. So $F(\tau'_p) = 0$. $F'(\tau) = -y_p^2 u'(y_i(1 - \tau)) + \eta\bar{y}\xi I'(\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2) - (\bar{y} - \eta\bar{y}\tau)^2 \xi I'(\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2) > 0$. So it suffices to show $F(\tau_p^*) > 0$. Note that $F(\tau_p^*) = F(\frac{\bar{y}-y_p}{\eta\bar{y}}) = y_p[u'(y_p(1 - \tau^*)) - \xi I'(\bar{y}\tau^* - \frac{\eta}{2}\bar{y}(\tau^*)^2)]$. When the optimal tax rate for the poor is τ_p^* , $u'(c_i) - \xi I'(X_i) = 0$ holds. Since $c_i > y_p(1 - \tau^*)$ and $X_i < \bar{y}\tau^* - \frac{\eta}{2}\bar{y}(\tau^*)^2$, it follows $u'(y_p(1 - \tau^*)) > u'(c_i)$ and $I'(\bar{y}\tau^* - \frac{\eta}{2}\bar{y}(\tau^*)^2) < I'(X_i)$. So $F(\tau_p^*) = F(\frac{\bar{y}-y_p}{\eta\bar{y}}) > 0 \iff \tau_p^* > \tau'_p$. \square

Remark 2

Proof. Consider the following two cases. When $\xi \geq \xi_p$, for $i = e, m, p$ the policy is $X_i = \bar{y}\tau_i^* - \frac{\eta}{2}\bar{y}(\tau_i^*)^2$, $c_i = y_i(1 - \tau_i^*)$ and $y_i u'(c_i) = (\bar{y} - \eta\bar{y}\tau)\xi I'(X_i)$. For all possible τ , the second order derivative with respect to τ is $u'(c_i)y_i^2 + \xi I'(X_i)(\bar{y} - \eta\bar{y}\tau)^2 - \xi I'(X_i)\eta\bar{y} < 0$, so $u(c_i) + \xi I(X_i)$ is concave in τ and the objective function is single-peaked. This property combined with $\tau_e > \tau_m > \tau_p$ (**Remark 1**) implies $U_e(\tau_e^*) > U_e(\tau_m^*) > U_e(\tau_p^*)$ and $U_p(\tau_p^*) > U_p(\tau_m^*) > U_e(\tau_e^*)$. When $\xi < \xi_p$, $U_e(\tau_e^*, X_e) > U_e(\tau_m^*, X_m)$ still holds. $U_e(\tau_m^*, X_m) > U_e(\tau'_p, X'_p)$, where $U_e(\tau'_p, X'_p)$ is decided by $X_p = \bar{y}\tau_p - \frac{\eta}{2}\bar{y}(\tau_p)^2$ and $y_i u'(y_i(1 - \tau)) = (\bar{y} - \eta\bar{y}\tau)\xi I'(\bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2)$. Construct $U_e(\tau'_p, X'_p) - U_e(\tau_p^*, X_p) = u_e(y_e(1 - \tau'_p)) + \xi I(X'_p) - u_e(y_e(1 - \tau_p^*) + \Delta) - \xi I(X'_p - \Delta)$, here Δ is the increase

of transfer from the policy $\{\tau'_p, X'_p\}$ to $\{\tau_p^*, X_p\}$ (this is implied by **Lemma 2**). Linearization obtains $U_e(\tau'_p, X'_p) - U_e(\tau_p^*, X_p) = \Delta[-u'_e(y_e(1 - \tau'_p)) + \xi I'(X'_p)]$. Since $-u'_e(y_e(1 - \tau'_p)) + \xi I'(X'_p)$ is the derivative of the utility of e with respect to X , evaluated at $X = X'_p < X_e$. Using $-y_e u'(c_e) + (\bar{y} - \eta\bar{y}\tau)\xi I'(X_e) = 0$ and $y_e > \bar{y} - \eta\bar{y}\tau$ we get $-u'_e(c_e) + (\frac{y_e - \eta\bar{y}\tau}{y_e})\xi I'(X_e) > 0$. Since $X'_p < X_e$, it follows from the concavity of $u(C) + \xi I(X)$ that $-u'_e(y_e(1 - \tau'_p)) + \xi I'(X'_p) > -u'_e(c_e) + (\frac{y_e - \eta\bar{y}\tau}{y_e})\xi I'(X_e) > 0$. So $U_e(\tau'_p, X'_p) > U_e(\tau_p^*, X_p)$, and $U_e(\tau_e^*, X_e) > U_e(\tau_m^*, X_m) > U_e(\tau_p^*, X_p)$. $U_p(\tau_p^*, X_p^*) > U_p(\tau_m^*, X_m^*) > U_p(\tau_e^*, X_e^*)$ follows according to similar logic. \square

Remark 3

Proof. When $\xi \geq \xi_p$, note $\frac{du(c_i) + \xi I(X_i)}{dy_i} = u'(y_i(1 - \tau_i^*))(1 - \tau_i^*) + [-u'(y_i(1 - \tau_i^*))y_i + \xi I'(\bar{y}\tau_i^* - \frac{\eta}{2}\bar{y}(\tau_i^*)^2)(\bar{y} - \eta\bar{y}\tau)]\frac{\tau}{y_i}$. Using $-u'(y_i(1 - \tau_i^*))y_i + \xi I'(\bar{y}\tau_i^* - \frac{\eta}{2}\bar{y}(\tau_i^*)^2)(\bar{y} - \eta\bar{y}\tau) = 0$ we get $\frac{du(c_i) + \xi I(X_i)}{dy_i} > 0$. Let $y^0 = \bar{y}$ be the income under egalitarian regime. Because U^0 is the highest utility one could get when one's income is \bar{y} , it follows $U^0 > U_p(\tau_p^*, X_p^*)$. When $\xi < \xi_p$, for $y_i \leq \bar{y}$, using $c_i + X_i = y_i(1 - \tau) + \bar{y}\tau - \frac{\eta}{2}\bar{y}\tau^2$, we get $\frac{\partial c_i}{\partial y_i} + \frac{\partial X_i}{\partial y_i} = 1$. Taking derivative of $u(c_i) + \xi I(X_i)$ with respect to y_i , we get: $\frac{\partial(u(c_i) + \xi I(X_i))}{\partial y_i} = \frac{dc_i}{dy_i}(u'(c_i) - \xi I'(X_i)) + \xi I'(X_i)$. Since $u'(c_i) - \xi I'(X_i) = 0$ when $\xi < \xi_p$, $\frac{\partial(u(c_i) + \xi I(X_i))}{\partial y_i} = \xi I'(X_i) > 0$. So $U^0 > U(\tau_p^*, X_p)$. \square

Proposition 2

Proof. To save notation use superscript ' in place of the subscript $t + 1$. Suppose first, the middle class are granted voting rights and decide to extend the suffrage to the poor. The poor's value, if revolting, is $V_p(r = 1 | w = 1, \gamma) = -d + (1 - q\gamma)V_0 + q\gamma\{U_p(\tau_p^*, X_p^*) + \beta E[V'_p(r = 1 | w = 1, \gamma')]\}$. $V_0 = \frac{U^0}{1 - \beta}$ is the poor's present value if they succeed. Note that $V_p(r = 1 | w = 1, \gamma)$ is linear in γ and $E[\gamma'] = \gamma$, it follows $V_p(r = 1 | w = 1, \gamma) = \frac{q\gamma U_p(\tau_p^*, X_p^*) + \frac{1 - q\gamma}{1 - \beta} U^0 - d}{1 - \beta q\gamma}$. The poor's value, when they do not fight, is $V_p(r = 0 | w = 1, \gamma) = \frac{U_p(\tau_p^*, X_p^*)}{1 - \beta}$. The poor will not fight as long as $V_p(r = 1 | w = 1, \gamma) \leq V_p(r = 0 | w = 1, \gamma)$. Rearranging this and using the result in **Remark 2** we get: $q\gamma \geq 1 - \frac{(1 - \beta)d}{U^0 - U_p(\tau_p^*, X_p^*)}$. Suppose the middle class does not extend the suffrage. The

poor's value when revolting is $V_p(r = 1 | w = 0, \gamma) = \frac{q\gamma U_p(\tau_m^*, X_m^*) + \frac{1 - q\gamma}{1 - \beta} U^0 - d}{1 - \beta q\gamma}$. Their value if not revolting is $V_p(r = 0 | w = 0, \gamma) = \frac{U_p(\tau_m^*, X_m^*)}{1 - \beta}$. Following the same logic, rearranging and using the results in **Remarks 2-3**, obtain the condition under which the poor launch a revolution conditional on $\{w = 0\}$: $q\gamma \leq 1 - \frac{(1 - \beta)d}{U^0 - U_p(\tau_m^*, X_m^*)}$. From

Remark 2, $U_p(\tau_p^*, X_p^*) > U_p(\tau_m^*, X_m^*)$, we get $1 - \frac{(1 - \beta)d}{U^0 - U_p(\tau_p^*, X_p^*)} < 1 - \frac{(1 - \beta)d}{U^0 - U_p(\tau_m^*, X_m^*)}$. Let $\overline{q\gamma} = 1 - \frac{(1 - \beta)d}{U^0 - U_p(\tau_m^*, X_m^*)}$, $q\gamma \leq 1 - \frac{(1 - \beta)d}{U^0 - U_p(\tau_p^*, X_p^*)}$. The middle class will extend the suffrage to the poor only if: $\underline{q\gamma} \leq q\gamma \leq \overline{q\gamma}$. When the condition holds, the value of the middle class from extending the suffrage is $V_m(w = 1 | s = 1, \gamma) = \frac{U_m(\tau_p^*, X_p^*)}{1 - \beta}$. If they do not, the value will be $V_m(w = 0 | s = 1, \gamma) = q\gamma\{U_m(\tau_m^*, X_m^*) + \beta E[V_m(w = 0 | s = 1, \gamma')]\} + \frac{(1 - q\gamma)U^0}{1 - \beta}$,

so $V_m(w = 0 \mid s = 1, \gamma) = \frac{q\gamma U_m(\tau_m^*, X_m^*) + \frac{(1-q\gamma)U^0}{1-\beta}}{1-\beta q\gamma}$. Hence the middle class only extend suffrage when the condition holds and $\frac{U_m(\tau_p^*, X_p^*)}{1-\beta} \geq \frac{q\gamma U_m(\tau_m^*, X_m^*) + \frac{(1-q\gamma)U^0}{1-\beta}}{1-\beta q\gamma}$. Rearranging we get: $q\gamma \leq \frac{U_m(\tau_p^*, X_p^*) - U^0}{\beta U_m(\tau_p^*, X_p^*) + (1-\beta)U_m(\tau_m^*, X_m^*) - U^0}$. **Assumption 3** guarantees that the right-hand side is always greater than $\bar{q}\gamma$. \square

Proposition 3

If the elite does not extend the suffrage, the poor always revolts. The elite gets $\frac{qU_e(\tau_e^*, X_e^*) + \frac{(1-q)U^0}{1-\beta}}{1-\beta q}$. When $q\gamma < q\bar{\gamma}$, the value for the elite to extend suffrage to the middle class is $V_e(s = 1 \mid \gamma) = q\gamma\{U_e(\tau_m^*, X_m^*) + \beta E[V_e(s = 1 \mid \gamma')]\} + \frac{(1-q\gamma)U^0}{1-\beta} = \frac{q\gamma U_e(\tau_m^*, X_m^*) + \frac{(1-q\gamma)U^0}{1-\beta}}{1-\beta q\gamma}$. The elite will extend the suffrage to the middle class only if $\frac{q\gamma U_e(\tau_m^*, X_m^*) + \frac{(1-q\gamma)U^0}{1-\beta}}{1-\beta q\gamma} \geq \frac{qU_e(\tau_e^*, X_e^*) + \frac{(1-q)U^0}{1-\beta}}{1-\beta q}$, which is true as long as $\gamma > 1$. When $q\bar{\gamma} \leq q\gamma \leq \bar{q}\gamma$, the value for the elite when extending suffrage to the middle class is $V_e(s = 1 \mid \gamma) = \frac{U_e(\tau_p^*, X_p^*)}{1-\beta}$. The elite will extend the suffrage to the middle class only if $\frac{U_e(\tau_p^*, X_p^*)}{1-\beta} \geq \frac{qU_e(\tau_e^*, X_e^*) + \frac{(1-q)U^0}{1-\beta}}{1-\beta q}$. This is equivalent to: $q < \frac{U_e(\tau_p^*, X_p^*) - U^0}{\beta U_e(\tau_p^*, X_p^*) + (1-\beta)U_e(\tau_e^*, X_e^*) - U^0}$. When $\bar{q}\gamma < q\gamma < 1$, the value for the elite from extending the suffrage to the middle class is $V_e(s = 1 \mid \gamma) = \frac{U_e(\tau_m^*, X_m^*)}{1-\beta}$. The elite extends the suffrage only if $\frac{U_e(\tau_m^*, X_m^*)}{1-\beta} \geq \frac{qU_e(\tau_e^*, X_e^*) + \frac{(1-q)U^0}{1-\beta}}{1-\beta q}$. We get $q < \frac{U_e(\tau_m^*, X_m^*) - U^0}{\beta U_e(\tau_m^*, X_m^*) + (1-\beta)U_e(\tau_e^*, X_e^*) - U^0}$. Write $\frac{U_e(\tau_p^*, X_p^*) - U^0}{\beta U_e(\tau_p^*, X_p^*) + (1-\beta)U_e(\tau_e^*, X_e^*) - U^0}$ and $\frac{U_e(\tau_m^*, X_m^*) - U^0}{\beta U_e(\tau_m^*, X_m^*) + (1-\beta)U_e(\tau_e^*, X_e^*) - U^0}$ respectively as \underline{q} and \bar{q} . It is easy to show that $\underline{q} < \bar{q} < 1$ (**Remark 2**).

Remark 4

Proof. The results follow from $\bar{q}\gamma = 1 - \frac{(1-\beta)d}{U^0 - U_p(\tau_m^*, X_m^*)}$, $q\gamma = 1 - \frac{(1-\beta)d}{U^0 - U_p(\tau_p^*, X_p^*)}$, and $\frac{\partial(\bar{q}\gamma - q\gamma)}{\partial U_p(\tau_m^*, X_m^*)} = \frac{U_p(\tau_p^*, X_p^*) - U^0}{[U^0 - U_p(\tau_m^*, X_m^*)]^2 [U^0 - U_p(\tau_p^*, X_p^*)]} < 0$, and $\frac{\partial(\bar{q}\gamma - q\gamma)}{\partial U_p(\tau_p^*, X_p^*)} = \frac{U^0 - U_p(\tau_m^*, X_m^*)}{[U^0 - U_p(\tau_p^*, X_p^*)]^2 [U^0 - U_p(\tau_m^*, X_m^*)]} > 0$. \square

Remark 5

Proof. It immediately follows from **Remark 1** that when $\xi > \xi_p$, $X_e > X_m > X^0 > X_p$. We want to show $\frac{dq\gamma}{d\xi} > 0$. Note that $q\gamma = 1 - \frac{(1-\beta)d}{U^0 - U_p(\tau_p^*, X_p^*)}$. It is equivalent to show $\frac{d(U^0 - U_p(\tau_p^*, X_p^*))}{d\xi} > 0$. Note that $\frac{d(u(c_i) + \xi I(X_i))}{d\xi} = \frac{\partial(u(c_i) + \xi I(X_i))}{\partial \xi} + \frac{\partial(u(c_i) + \xi I(X_i))}{\partial \tau} \cdot \frac{\partial \tau}{\partial \xi} + \frac{\partial(u(c_i) + \xi I(X_i))}{\partial X_i} \cdot \frac{\partial X_i}{\partial \xi}$. For the utility under the egalitarian regime, U^0 , it always holds that $\frac{\partial(U(c^0) + \xi I(X^0))}{\partial \tau} = 0$ and $\frac{\partial(U(c^0) + \xi I(X^0))}{\partial X^0} = 0$. So $\frac{d(u(c_i) + \xi I(X_i))}{d\xi} = I(X^0)$. For $i = p$, when $\xi \leq \xi_p$, $\frac{\partial \tau}{\partial \xi} = 0$ since $\tau \equiv \frac{\bar{y} - y_p}{\bar{y}}$. $\frac{\partial(u(c_p) + \xi I(X_p))}{\partial X_p} = -u'(c_p) + \xi I(X_p) = 0$, as $X_p + c_p \equiv y_p(1 - \tau_p) + \bar{y}\tau_p - \frac{\eta}{2}\bar{y}\tau_p^2$ and $\xi I'(X_p) = u'(c_p)$ (**Proposition 1**). When $\xi > \xi_p$, $\frac{\partial(u(c_p) + \xi I(X_p))}{\partial \tau} = 0$

and $\frac{\partial(u(c_p)+\xi I(X_p))}{\partial X_p} = \frac{\partial(u(c_p)+\xi I(X_p))}{\partial \tau} \cdot \frac{\tau}{X_p} = 0$ (**Proposition 1**). Therefore $\frac{d(u(c_p)+\xi I(X_p))}{d\xi} = I(X_p)$. So $\frac{d(U^0 - U_p(\tau_p^*, X_p^*))}{d\xi} = I(X^0) - I(X_p) > 0$. Hence the area corresponding to region 1 increases. This proves the claim. \square

Remark 6

Proof. When y_p increases, the marginal effect on the relaxing of constraint in the maximization of U^0 is $\xi I'(X^0)n_p$, where n_p is the population size of the poor. The marginal effect of increase in y_p on $U_p(\tau_p^*, X_p^*)$ boils down to $u'(c_p^*)(1 - \tau_p^*) + \xi I'(X_p^*)n_p(\tau_p^* - \frac{\eta}{2}\tau_p^{*2})$. Using the condition $u'(c^0) = \xi I'(X^0)$, $\xi I'(X^0)n_p$ can be rewritten as $u'(c^0)(1 - \tau_p^*)n_p + \xi I'(X^0)n_p\tau_p^*$. Since $c_p^* < c^0$, $X_p^* < X^0$, and $n_p < 1$, it follows $u'(c_p^*)(1 - \tau_p^*) + \xi I'(X_p^*)n_p\tau_p^* > \xi I'(X^0)n_p$. This dominates the sign of $\frac{\partial(U^0 - U_p(\tau_p^*, X_p^*))}{\partial y_p}$ when the fiscal distortion is small. Thus $U^0 - U_p(\tau_p^*, X_p^*)$ tends to decrease when y_p becomes larger, implying a downward shift in $q\gamma$. \square

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Notes

1. In this paper we use the term ‘universal suffrage’ and ‘universal male suffrage’ interchangeably.
2. The restrictive criteria include estate representation, property, income, tax, literacy, and economic independence. See Section 4 for a full description.
3. Suppose otherwise, where the middle class is sufficiently large in size and is the median voter under universal suffrage the distinction between partial and universal suffrage in terms of economic policies then disappears. This reduces the number of cases in equilibrium, but the main intuition still holds.
4. See more discussion in Section 3.4. I am grateful to a referee for raising this question.
5. The intuition can be that the functioning of a normal state requires a minimum amount of public goods, such as law and order and national defense. A state of anarchy (in which $X = 0$) is prohibitively large for all. An example of the functional form is $I(X) = \log(X)$.
6. The assumption simplifies the model without a loss of generality. As we will see shortly, if the newly franchised middle class extends suffrage to the poor immediately, suffrage will be universal. This possibility should be anticipated by the elite, who must prefer universal suffrage to revolution. Thus the model takes account of different choices of the elite: partial extension and universal extension.
7. For example, the requirement that the poor revolts when suffrage is not extended rules out cases of extreme repression. Yet the only difference created by this complication is whether there are conflicts or not when suffrage is not extended at all, but not the decision about extension per se, as the threshold values regard to q are independent of d .
8. We are aware of the difference between the range of parameter conditions and the likelihood of parameters taking specific values in a certain range. Consequently the substantive discussion

here should be taken with this caveat in mind. Yet without any strong prior parameter values, the assessment of parameters should converge to a uniform distribution, and it is reasonable to claim that the likelihood of a range of parameter conditions is proportional to the range itself.

9. See Przeworski (2009) for an empirical test on the causes of suffrage extensions.
10. The years during World War II (1940–1945) are also excluded. We do not include post-1995 data because extensions are extremely rare after 1995.
11. I.e., the qualification concerning only males.
12. Tilly (1995) notices a connection between the repression of civil rights and the accumulation of state power in Britain during the Napoleonic Wars.
13. The extension at $t - 1$ does not imply a high probability of extension at t .

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