Democracy and International Conflict

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Abstract

During the past two centuries, western nations have successively extended the voting franchise to citizens of lower income. We explain this process of democratization as a rational way for incumbent elites to wage war effectively on other nations, as in a strategic game of international conflict handing over military spending decisions to citizens who face a lower tax cost of arming may confer a strategic delegation advantage. We find supporting empirical evidence in case studies of franchise extensions in the United Kingdom, France, and the United States.

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1 Introduction

At a banquet of the National Union of Conservative and Constitutional Associations in June of 1872, Benjamin Disraeli made the following remarks on the thinking behind the Reform Act of 1867, which had substantially increased the number of British males with the right to vote:

> That act was founded on a confidence that the great body of the people of this country were "Conservative." I use the word in its purest and loftiest sense. I mean that the people of England, and especially the working classes of England, are proud of belonging to a great country, and wish to maintain its greatness—that they are proud of belonging to an Imperial country, and are resolved to maintain, if they can, the empire of England [...] (cited in the *Times*, June 25, 1872).

In short, Disraeli believed more inclusive suffrage would help sustain and possibly expand the British empire.

The 1867 reform was a part of the larger transformation in which, during the 19th and 20th centuries, western nations more generally extended the right to vote to previously disenfranchised groups. In this paper we argue that this extension can be explained as a rational commitment to higher defense expenditure in the face of the threat of international conflict.

In a seminal contribution, Meltzer and Richard [28] argued that the growth in government expenditure during the past two centuries could be explained by successive franchise extensions. This argument depends on two observations. One, that income distributions typically have the property that median income is lower than average income. Two, that the extension of franchise was generally in the direction of including lower-income citizens, which would further lower the median income in the voting population. Meltzer and Richard assume a government that only redistributes income. Since the tax cost of redistributive measures is then lower for the voter of median income

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than for the voter of average income, the median voter would tend to demand more redistribution.

The Meltzer-Richard argument raises the question of why the incumbent elite would choose to extend the franchise, since it would seem to make them worse off. A new, lower-income median voter would demand more transfers than preferred by the incumbent median voter. Hence an extension of franchise in a closed redistributive state would tend to hurt incumbents. So unless one wishes to attribute altruistic motives to incumbents, franchise extension becomes problematic.

To deal with this, Acemoglu and Robinson [1, 2] extend the Meltzer-Richard framework to include a probability of insurrection by excluded lower-income groups. Extension of franchise then becomes a means for incumbents to deal with the threat of revolution. Aidt and Franck [3] provide some evidence that the "Swing riots" in England in 1830 and 1831 did in fact have impact on the Great Reform Act of 1832. A crucial assumption in Acemoglu and Robinson's argument is that unlike simply increasing transfers to the disenfranchised, extending the franchise is an irreversible commitment. Along similar lines, Ticchi and Vindigni [35] argue that an elite interested in drafting citizens for war may find it in its interest to compensate them through democratization, providing an explanation for Levi's [23, 24] observation that the extensions of franchise occurred in conjunction with military expansion and the abolition of privileged exceptions from conscription. Focusing on a different mechanism, Lizzeri and Persico [25] note that even in the absence of a threat of insurrection, an elite may want to extend the franchise in order to provide better incentives for politicians through increased competition.

In this paper, in contrast, we argue that when tax revenues can also be spent on military capacity in strategic interaction with potential opponent nations, extending the franchise may function as a way for the elite to rationally commit to higher defense expenditure. In addition to a theoretical argument for why this should be the case, we provide a detailed historical analysis that supports this account.

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The theoretical argument runs along the following lines. Consider an economy in which the only good provided by government is defense, financed by a uniform linear tax on income. The size of defense spending relative to that of other nations determines the size of the territory controlled by the nation, which in turn is a public good to its citizens. Suppose all nations are democracies, and that the median voter theorem holds (e.g., because of two-party competition). Then a nation with a relatively lower median/mean income ratio spends relatively more on defense in equilibrium, since the less the median voter earns compared to the average voter, the lower is his tax cost of an increase in defense spending. Suppose initially a rich elite controls the government. In certain cases, it may be in the strategic interest of the elite to extend the voting franchise to lower-income citizens. This is because a median voter of lower income demands a larger defense budget, commitment to which would be desirable from the point of view of the original incumbent median voter because of its strategic effect on the behavior of opponent nations. Extending the franchise can therefore have the effects of strategic delegation.[1] In particular, we note that the incumbent elite of a *hegemonic* nation, in the sense of one that is already among the militarily superior nations, has an incentive to extend the franchise, as this has the strategic effect of making opponents reduce their defense expenditure.

The theory also implies that more democratic nations should spend relatively more on military capacity. And, indeed, empirically there is a significant positive correlation between a country's military strength and its degree of democracy. Roughly speaking, powerful countries are democratic and weak countries are autocratic. To see this, one can measure a country's degree of democracy by the Polity IV index (which scores from 10 to -10), and a country's military strength by its military expenditure in US dollars (SIPRI, 2012). The military alliance NATO, whose 28 members are highly democratic (all Polity IV scores above 8 in 2012, with average 9.53), has a military budget of around 990 billion dollars, which is approximately 60% of the world's military

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[1]For more on strategic delegation in conflict situations, see, e.g., Wärneryd [36].

expenditure. Among NATO members, the United States alone is responsible for 40% of the world's expenditures, and the European Union for 15%. China, which is among the least democratic countries (Polity IV score -7), has a military budget of around 10%, and Russia, only slightly more democratic than China (Polity IV score 4), has around 5%. All other countries each have less than 5%.[2]

From a historical perspective, the implications of our theory explain particularly well the three central franchise extensions of the United Kingdom, which coincide with the stages of British colonial expansion in the 19th century. In the late 19th century, we see similar developments in France and the United States. Many countries extended the franchise after World War I, but while most of them became autocratic within a decade (i.e., Italy, Germany, and Japan), the hegemonic powers, the UK and the US, maintained and further developed their democracies, which helped them be successful in World War II. The last franchise extension we consider took place in the US in the 1960s and 70s and coincided with the Cold War, which eventually ended with the collapse of the Soviet Union and US supremacy. We except from consideration the democratic reforms in Germany, Italy, and Japan after WWII, as they were largely imposed by the winning powers.

On a methodological level, a novel theoretical contribution of this paper is that we analyze what determines participation in a nation-state's collective decision-making when the nation interacts strategically with other nations. We build, on the one hand, on the recent literature dealing with the strategic analysis of conflict (see, e.g., Hirshleifer [19], Skaperdas [32], Wärneryd [37, 38, 39]), and, on the other, on the literature on the political determination of government spending (see, e.g., Meltzer and Richard [28] for the seminal contribution or Persson and Tabellini [29] for a survey).

In a broader sense, this paper contributes to the literature on the "democratic peace" hypothesis, which explores the relationship between democratic institutions and international conflict. Lake [22], Fearon [12], and De Mesquita

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[2]For more on democratic militarism, see Caverley [7].

et al [9] are some examples from this literature.

2   Defense spending in democracies

We consider $n \geq 2$ countries in potential conflict. In country $c \in \{1, 2, \ldots, n\}$ live a continuum of risk neutral individuals of total mass 1. Individuals differ only with respect to their initial endowments w_{ci}, which are distributed according to the cumulative distribution function F^c supported on $\mathbb{R}_+$.

The potential conflict among the countries concerns control of territory, or land, the total value of which we normalize to 1. Out of the value of the share of the land controlled by country c, citizen i gets an individual share $\sigma_c(w_{ci})$, potentially dependent on income, with $\int \sigma_c(w) \mathrm{d}F^c(w) = 1$.

The share of land controlled by country c, given military capacity levels $x_1, x_2, \ldots, x_n$, is $p^c(x_1, x_2, \ldots, x_n)$. We assume the conflict technology p^c is a strictly increasing and strictly concave function of own capacity. Assuming symmetry, p^c is then convex in the capacity of any given opponent.

In country c, the military production function $x_c = \mu_c s_c$, where $\mu_c > 0$, governs how military spending s_c is transformed into military capacity. Military spending is financed out of a nondistortionary, uniform linear tax t_c on initial endowments under a balanced-budget restriction.

The expected utility of individual i in country c is then

$$u_{ci} := (1 - t_c)w_{ci} + p^c(x_1, x_2, \ldots, x_n)\sigma_c(w_{ci}).$$

Define $y_c = \int w \mathrm{d}F^c(w)$, per capita income in country c. Since this number will turn out to have no special significance for the phenomena we wish to focus on here, we shall for simplicity assume that we have $y_1 = y_2 = \ldots = y_n = 1$. Hence, under the budget balance assumption, we may write individual utility as

$$u_{ci}(x_1, x_2, \ldots, x_n) = (1 - (x_c/\mu_c))w_{ci} + p^c(x_1, x_2, \ldots, x_n)\sigma_c(w_{ci}).$$

An optimal strictly positive level of military capacity x_c from the point of view of individual i in country c, given the military capacities of other countries, is

then defined by the first-order condition

$$-\frac{w_{ci}}{\mu_c} + p_c^c(x_c, \ldots)\sigma_c(w_{ci}) = 0,$$

where p_c^c is the first partial derivative of p^c with respect to x_c.

We hence have that

$$\frac{\partial x_c}{\partial w_{ci}} = \frac{(1/\mu_c) - p_c^c \sigma_c'}{p_{cc}^c \sigma_c},$$

where σ_c' is the first derivative of σ_c. The individually optimal x_c is therefore declining in income if σ_c' is zero or small on the relevant interval. Consider, as an example, an economy where the incumbent elite gets almost all of the value of the land, while the rest is split equally among the poorer citizens. Then σ_c' is zero almost everywhere. In the following, we shall assume this holds, and, to simplify notation, we shall set $\sigma_c(w) = 1$ for all w. This implies that everyone gets an equal share of the value of the land, or, equivalently, that land is a public good.

The optimal x_c is then strictly declining in w_{ci}, so that ideal military capacities are inversely ordered by initial endowments in each country. The level of military capacity preferred by the individual with the median initial endowment among the enfranchised, or more generally among what Bueno de Mesquita *et al* [10] call the *selectorate*, the group of citizens who get to influence political decisions, is therefore a Condorcet winner or unbeatable policy.[3]

In *international* equilibrium, military capacities will be

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[3]We might also consider the ideal policy of an autocrat who has an encompassing interest, in the sense of McGuire and Olson [27], in the economy. Such a ruler consumes some fixed share $0 < r \leq 1$ of the economy's wealth, and hence has utility $r(y_c - (x_C/\mu_c) + p^c(x_1, x_2, \ldots, x_n))$. The autocrat's first-order condition for an optimal x_c is then $-(1/\mu_c) + p_c^c = 0$—i.e., the autocrat's preferences are the same as those of a citizen of mean income in a democracy. An autocracy would therefore spend less on military capacity than would a democracy, something which also appears to be the case empirically (see, e.g., Reiter and Stam [31]).

1. the political equilibrium military capacities within in each country, i.e., those preferred by the respective incumbent median voters, and

2. best replies against each other.

Suppose, for example, that there are only two nations, 1 and 2, and that the equilibrium military capacity in each country is that preferred by the median enfranchised voter m. Then in an interior international equilibrium, military capacities will satisfy

$$-\frac{w_{1m}}{\mu_1} + p_1^1(x_1, x_2) = 0 \tag{1}$$

and

$$-\frac{w_{2m}}{\mu_2} - p_2^1(x_1, x_2) = 0. \tag{2}$$

In particular, if the countries are identical, in the sense of having the same income distribution and military production technology, there will be a symmetric equilibrium, where defense spending is the same in both countries.

Differentiating the best-reply conditions (1) and (2) with respect to w_{1m} and solving the resultant set of equations we find that

$$\frac{\partial x_1}{\partial w_{1m}} = \frac{p_{22}^1}{(p_{22}^1 p_{11}^1 - (p_{12}^1)^2)}$$

and

$$\frac{\partial x_2}{\partial w_{1m}} = \frac{p_{12}^1}{(p_{22}^1 p_{11}^1 - (p_{12}^1)^2)}, \tag{3}$$

Notice that since the conflict technology is symmetric, i.e., since $p^1(x_1, x_2) = 1 - p^1(x_2, x_1)$, we must have $p_{12}^1(x_1, x_2) = -p_{21}^1(x_2, x_1) = -p_{12}^1(x_2, x_1)$. Hence if we have $x_1 = x_2$, it must be the case that $p_{12}^1(x_1, x_2) = 0$. Consider now a situation where the countries are identical, and in symmetric equilibrium, and increase w_{1m}. We then see that in the new equilibrium country 1, the country with a more inequal distribution of income, will have the larger defense budget.

Consider now the equilibrium utility of citizen i in country 1 as a function of the income of the median voter in country 1. It is

$$u_{1i}(w_{1m}) := (1 - (x_1(w_{1m})/\mu_1))w_{1i} + p^1(x_1(w_{1m}), x_2(w_{1m})).$$

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Differentiating with respect to w_{1d}, we see that

$$\frac{\partial u_{1i}(w_{1m})}{\partial w_{1m}} = (-(w_{1i}/\mu_1) + p_1^1)\frac{\partial x_1}{\partial w_{1m}} + p_2^1\frac{\partial x_2}{\partial w_{1m}}.$$

In particular, suppose citizen i is the median voter himself. Then the first term is zero by optimality, and the sign of the derivative with respect to the median voter's income will, from (3), be determined by the sign of p_{12}^1. In general, if the median voters of the two countries have different incomes, we will have $p_{12}^1 \neq 0$. In these cases there are other individuals who the median voter of country 1 would prefer to himself as decision-makers regarding military capacity. Because of the strategic effect on the military spending of country 2, there is an incentive for commitment or delegation. In the following we shall show how this incentive can explain franchise extension.

3   Franchise extension

In the following, we shall assume that the conflict technology has the more specific form

$$p^c(x_1, x_2, \ldots, x_n) := \begin{cases} x_c/X & \text{if } X > 0 \\ 1/n & \text{otherwise,} \end{cases}$$

where $X := \sum_k x_k$.[4]

Define $\tilde{w}_{ci} := w_{ci}/\mu_c$, and let w_{cm} be the income of the incumbent median voter in country c. In an interior international equilibrium[5] it must then hold for each c that

$$x_c = X - \tilde{w}_{cm}X^2. \tag{4}$$

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[4]This particular specification of the conflict technology has a long pedigree, going back at least to Haavelmo's [17] discussion of international conflict. Also see Hirshleifer [18] and Skaperdas [33].

[5]An interior equilibrium exists if the $\tilde{w}_{cm}$ are sufficiently close to each other, in a sense which can be made precise, or if there are only two countries in potential conflict. We shall assume throughout that one of these is the case.

Summing over c, we get that

$$X = \sum_c x_c = nX - X^2 \sum_c \tilde{w}_{cm},$$

and hence that

$$X = \frac{n-1}{\tilde{W}}, \tag{5}$$

where $\tilde{W} := \sum_c \tilde{w}_{cm}$.

The ratio of the equilibrium shares of the resource pool controlled by two countries c and c', or their relative *power*, is therefore

$$\frac{p^c(x_1, x_2, \ldots, x_n)}{p^{c'}(x_1, x_2, \ldots, x_n)} = \frac{1 - \tilde{w}_{cm}((n-1)/\tilde{W})}{1 - \tilde{w}_{c'm}((n-1)/\tilde{W})}.$$

Hence, in particular, if all countries are equally efficient in converting spending into military capacity, a country with a relatively lower median voter income has relatively greater power in equilibrium. We shall call a country with the greatest power *hegemonic*. More generally, we have the following.

Proposition 1 *A country with a relatively lower $\tilde{w}_{cm}$ has relatively greater power in equilibrium.*

Assume that all countries have the same income distribution, and that in every country there is a threshold income $\bar{w}_c$ such that a citizen i has the right to vote if and only if $w_{ci} \geq \bar{w}_c$. Then w_{cm} may be seen as a measure of the degree of democracy of a country, in the sense that a lower w_{cm} corresponds to a larger franchise. If all countries have the same level of military technology, it must then also be the case that the country with the greatest degree of democracy is hegemonic.

Consider now the equilibrium utility of citizen i of country c when the level of military spending is that preferred by citizen m. It is

$$u_{ci}(\tilde{w}_{cm}) = w_{ci} + \left(1 - \tilde{w}_{cm}\frac{n-1}{\tilde{W}}\right)\left(1 - \tilde{w}_{ci}\frac{n-1}{\tilde{W}}\right).$$

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We have that

$$\frac{\partial u_{ci}(\tilde{w}_{cm})}{\partial \tilde{w}_{cm}} = \frac{n-1}{\tilde{W}^2}\left(\tilde{w}_{ci}\left(1-\tilde{w}_{cm}\frac{n-1}{\tilde{W}}\right)-(\tilde{W}-\tilde{w}_{cm})\left(1-\tilde{w}_{ci}\frac{n-1}{\tilde{W}}\right)\right).$$

If this derivative is negative, the citizen would be strictly better off if the median voter had lower income. In the following we shall mean by *franchise extension* a reform such that citizens of lower income than the currently enfranchised are given the right to vote, thus lowering the income of the enfranchised voter of median income.

Since we have that

$$\frac{\partial u_{ci}(\tilde{w}_{cm})}{\partial \tilde{w}_{cm}\partial \tilde{w}_{ci}} = -\frac{(n-1)(2(n-1)\tilde{w}_{cm}-n\tilde{W})}{\tilde{W}^3},$$

franchise extension preferences are monotonic in $\tilde{w}_{ci}$. This implies that if the median enfranchised voter prefers an extension of the franchise, then there is a majority in favor of franchise extension among the enfranchised.

Suppose, therefore, that we have $\tilde{w}_{ci} = \tilde{w}_{cm}$, i.e., that the citizen under consideration is himself the median voter. We then have that

$$\left.\frac{\partial u_{ci}(\tilde{w}_{cm})}{\partial \tilde{w}_{cm}}\right|_{\tilde{w}_{ci}=\tilde{w}_{cm}} = -\frac{(n-1)(\tilde{w}_{cm}-\tilde{W}_{\sim c})((n-2)\tilde{w}_{cm}-\tilde{W}_{\sim c})}{\tilde{W}^3}, \quad (6)$$

where $\tilde{W}_{\sim c} := \sum_{k\neq c} \tilde{w}_{km}$.

In particular, we note that if we have $n = 2$, the derivative in (6) is negative (positive) as $\tilde{w}_{cm} < \tilde{W}_{\sim c}$ ($\tilde{w}_{cm} > \tilde{W}_{\sim c}$). That is, an incumbent median voter who faces an opponent whose income (adjusted for military production technology) is different from his own would want to delegate the spending decision to somebody whose income is further away from the opponent's.

Figure 1 illustrates the logic of rational franchise extension in the 2-country setting. When the original median voter in country 1 is in control, the best-reply curves intersect at $(x_1^\star, x_2^\star)$. If country 1 extends the franchise so that the new median voter's best-reply curve is further to the right, we get a new equilibrium at (x_1', x_2'), where country 1's military capacity is greater than before
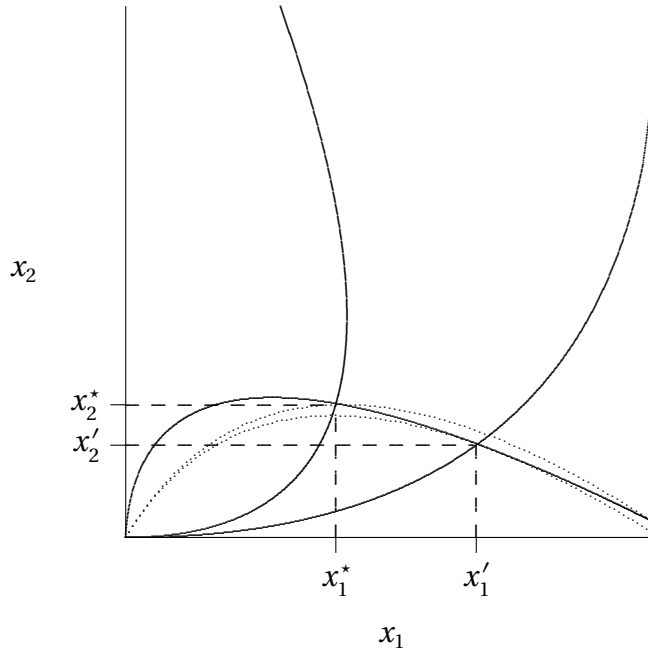
Figure 1: Rational franchise extension.

and country 2's smaller. The dotted curves are indifference curves of the original median voter of country 2. The new equilibrium sits on a lower indifference curve, associated with greater utility for the original median voter. In effect, country 1's extension of franchise is a commitment to greater military spending, which leads the opponent to reduce theirs in return, as their relative cost of arming is now greater.

If we have $n > 2$ and all countries identical, (6) reduces to

$$-\frac{(n-2)(n-1)}{n^3 \tilde{w}_{cm}} < 0,$$

so that an incumbent median voter faced with several identical opponents would *always* want to hand over the reins to somebody with lower income.

More generally, we can conclude the following.

Proposition 2 *The current incumbent median voter of country c has a strict*

incentive to extend the franchise when we have

$$\tilde{w}_{cm} < \tilde{W}_{\sim c} \ and \ (n-2)\tilde{w}_{cm} < \tilde{W}_{\sim c}.$$

Notice that while (6) is also negative if we have $\tilde{w}_{cm} > \tilde{W}_{\sim c}$ and $(n-2)\tilde{w}_{cm} > \tilde{W}_{\sim c}$, i.e., if we have $\tilde{w}_{cm} > \tilde{W}_{\sim c}$ and $n > 2$, this cannot happen in an interior equilibrium. Expressions (4) and (5) imply that in order for x_c to be positive in equilibrium, we must have that

$$\frac{(n-1)\tilde{w}_{cm}}{\tilde{W}_{\sim c} + \tilde{w}_{cm}} < 1.$$

If we have $\tilde{w}_{cm} > \tilde{W}_{\sim c}$, the ratio $\tilde{w}_{cm}/(\tilde{W}_{\sim c} + \tilde{w}_{cm})$ is strictly greater than $1/2$, so the condition cannot hold. Since we are focusing on interior equilibria, we therefore ignore this scenario.

Ideally, of course, we should consider the game that results when a group of countries are allowed to determine the extents of their franchises simultaneously, in anticipation of the conflict game to follow. It turns out that not much can be said in general about this game, however.

The expected equilibrium utility of the current incumbent median voter in country c, given that the new median voter in each country is some citizen m', is

$$u_{cm}(\tilde{w}_{cm'}) = w_{cm} + \left(1 - \tilde{w}_{cm'}\frac{n-1}{\tilde{W}'}\right)\left(1 - \tilde{w}_{cm}\frac{n-1}{\tilde{W}'}\right),$$

where $\tilde{W}' := \sum_c \tilde{w}_{cm'}$. At an interior equilibrium of the simultaneous franchise determination game, we must therefore have that

$$\frac{\partial u_{cm}(\tilde{w}_{cm'})}{\partial \tilde{w}_{cm'}} = \frac{n-1}{\tilde{W}'^2}\left(\tilde{w}_{cm}\left(1 - \tilde{w}_{cm'}\frac{n-1}{\tilde{W}'}\right) - (\tilde{W}' - \tilde{w}_{cm'})\left(1 - \tilde{w}_{cm}\frac{n-1}{\tilde{W}'}\right)\right) = 0$$

for all c, i.e., that

$$\tilde{w}_{cm'} = \frac{\tilde{W}'_{\sim c}(n\tilde{w}_{cm} - \tilde{W}'_{\sim c})}{\tilde{W}'_{\sim c} + (n-2)\tilde{w}_{cm}} \tag{7}$$

for all c. Although u_{cm} is not in general concave in $\tilde{w}_{cm'}$, evaluation of the second derivative at the critical point yields that

$$\left.\frac{\partial^2 u_{cm}(\tilde{w}_{cm'})}{\partial \tilde{w}_{cm'}^2}\right|_{\frac{\partial u_{cm}(\tilde{w}_{cm'})}{\partial \tilde{w}_{cm'}}=0} = -\frac{(\tilde{W}'_{\sim c} + (n-2)\tilde{w}_{cm})^4}{8(\tilde{W}'_{\sim c})^3(n-1)^2\tilde{w}_{cm}^3} < 0,$$

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so we do in fact have optimality.

Beyond (7), not much can be done to further characterize equilibrium franchises. In the following we consider some special cases.

Suppose we have $n = 2$. In case the countries are identical, neither extends the franchise. If they are not identical, an interior equilibrium does not exist.

If we have $n > 2$ identical countries, (7) implies that for each c we have that

$$\tilde{w}_{cm'} = \frac{2 - n + n^2}{n(n+1)} \tilde{w}_{cm} < \tilde{w}_{cm}.$$

Hence in this case all countries extend the franchise. The amount of the extension is declining in the number of countries, and approaches zero as it approaches infinity, as we have that

$$\lim_{n \to \infty} \frac{2 - n + n^2}{n(n+1)} = 1.$$

Finally, consider the case of one hegemonic country and $n - 1$ identical other countries. This case does not allow for an analytic solution in general, but suppose, as an example, that the adjusted income of the incumbent median voter in the hegemonic country is .4, and that there are two other countries, both with adjusted incumbent median voter incomes of .5. In equilibrium, the hegemonic country then selects a new median voter with adjusted income approximately equal to .17, and the others each select someone with adjusted income approximately equal to .48. That is, the hegemonic country extends the franchise substantially, the others just a little bit.

4 Historical evidence

A central implication of Propositions 1 and 2 is that a country that has military technology superior to, and a greater degree of democracy than, its potential opponents, is hegemonic and has an incentive to extend the franchise. After such an extension it should have greater military spending and capacity, and hence greater power. In the following we consider the relationship between

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Table 1: Countries of hegemonic type

Country	1810s–1850s	1860s–1900s	1910s–1940s	1950s–1980s
France		X		
UK	X	X	X	
USA		X	X	X

military technology, degree of democracy, military expenditure and franchise extension of the world's leading powers from the early 19th century to recent times.

We divide this time span into four periods of approximately 40 years each. In each of the four periods we see a positive correlation between degree of democracy, military technology, military spending, and power, as predicted by Proposition 1. Moreover, in line with Proposition 2, we observe that franchise extensions took place in countries with superior military technology and the most democratic institutions, i.e., countries of hegemonic type. These countries were, respectively, the United Kingdom for the 1810s–1850s, the United Kingdom, France, and the United States for the 1860s–1900s, the United States and the United Kingdom for the 1910s–1940s, and the United States for the 1950s–1980s (see Table 1). In all these countries, franchise extensions led to even greater military expenditure and power, which reinforced their hegemonic position.

Data and methodology We shall always focus on a small number of countries, from 4 to 8, which we identify as the world's leading powers of the period concerned. The argument is that, outside of this small league, countries are inactive in international conflict as they take the world's order as given. We select leading powers according to their superior military technology. In each of the four periods, two crucial determinants of military technology are heavy industry and access to credit. We estimate a country's heavy industry by its iron and steel production and its primary energy consumption.[6] The nature

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[6]These data are from the Correlates of War (COW) data set on National Material Capabili-

Table 2: Determinants of military technology

	1810s–1850s	1860s–1900s	1910s–1940s	1950s–1980s
Access to credit	X	X	X	X
Heavy industry	X	X	X	X
Population size	X	X		
Oil supply			X	X

of military technology changed through time. Population size was important for military technology in the early 19th century, but became less and less relevant later. The crucial determinant of 20th century military technology was a safe supply of oil (see Table 2).[7] For each time period, heavy industry, access to credit, population size, and access to oil jointly determine a country's military technology in a complex way. For instance, in the 19th century heavy industry and access to credit were substitutes of population size, as good weapons and fast transportation could compensate for a small population. Oil was not yet relevant. Later, in the 20th century, population size lost importance, and oil became the crucial complement of heavy industry and access to credit due to the progressive mechanization of warfare.

Information on military expenditure is from the Correlates of War (COW) data set on National Material Capabilities, measured in British pounds until 1914 and in US dollars afterwards. To estimate a country's degree of democ-

ties. Iron and steel production represents a country's total production of pig iron until 1899, and of steel from 1900 onwards. It is originally measured in tons. Primary energy consumption represents a country's total consumption of petroleum, electricity, and natural gas. It is originally measured in one thousand metric coal-ton equivalents. We instead measure each these two variables in relative terms, i.e., as a share of the total for all leading powers in the period concerned. Further details about this and all other data and regression equations used in the following are available on demand from the authors.

[7]The data on total population are from the Correlates of War (COW) data set on National Material Capabilities. Total population is measured in thousands. The data on oil production are from The Shift Project (TSP) data portal and is measured in millions of tons.

racy, we report the percentage of its citizens having nominal voting rights, and discuss various limitations on such rights based on race, sex, age, and so on. We also look at the country's average Polity IV index.[8] The Polity IV index is a composite measure of quality of checks and balances on the executive, openness, competitiveness, and attendance in elections. We use the Polity IV index to distinguish "real" franchise extensions from purely nominal ones. In short, a citizen has real voting rights if 1) he is nominally enfranchised, and 2) his democratically elected representatives have decision power on the budget. Although we do not provide quantitative data on a country's power, we extensively discuss this variable in the text. To measure a country's power, we consider its colonial domains and its economic/political influence on other countries. To estimate increases in a country's power, we report its victories in wars and territorial acquisitions.

4.1   The 1810s–1850s

In the 1810s–1850s, the United Kingdom had the best military technology and the most democratic institutions, and was therefore most likely of hegemonic type (see Figures 2 and 3). In line with our theory, it extended the franchise and increased its military expenditure, expanding its power via its colonial domains.

Events The Congress of Vienna of 1815 determined the balance of power of post-Napoleonic Europe. The leading powers—the United Kingdom, Russia, Austria, and France—divided the world into spheres of influence (Albrecht-Carrié [4], Ch. 1). During the period 1815–1853 there were no wars between these powers, but their competition for world supremacy was greater than ever. The United Kingdom, the most democratic power (see Figure 2), expanded its empire more than anyone else. The period ended with the Crimean

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[8]These data are from the Polity IV Annual Time Series data set. Democracy is measured by the Polity index on a scale from -10 to 10, where -10 is highly autocratic and 10 highly democratic.
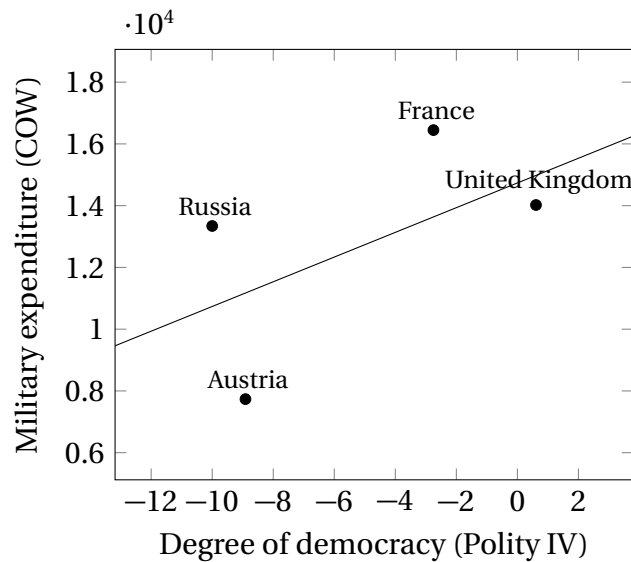
Figure 2: Average degree of democracy (Polity IV) and average military expenditure (COW) of main actors in world politics for the period 1816–1859.

war of 1853–1856, which saw Russia defeated by a coalition of all other powers.[9]

Democracy The United Kingdom had had roughly democratic institutions for a long time, but extended the franchise in this period for the first time (Evans [11], Ch. 1). More specifically, the British parliament had acquired veto power on the budget back in 1688, but only very wealthy adult males had voting rights. No fundamental democratic reforms took place in the 18th century. In 1832, however, a liberal government extended the franchise to include about 15% of adult males (see Evans [11], Ch. 3). Russia and Austria were strongly autocratic (see Figure 2). Serfdom was abolished in Russia only in 1861, and Austria was the most repressive state in Europe. France was somewhere in between. Universal male suffrage was introduced during the French Revolution, but quickly abolished by Napoleon. After Napoleon's defeat, France

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[9]Although Austria remained formally neutral, it substantially contributed to the defeat of Russia (Albrecht-Carrié [4], Ch. 3).
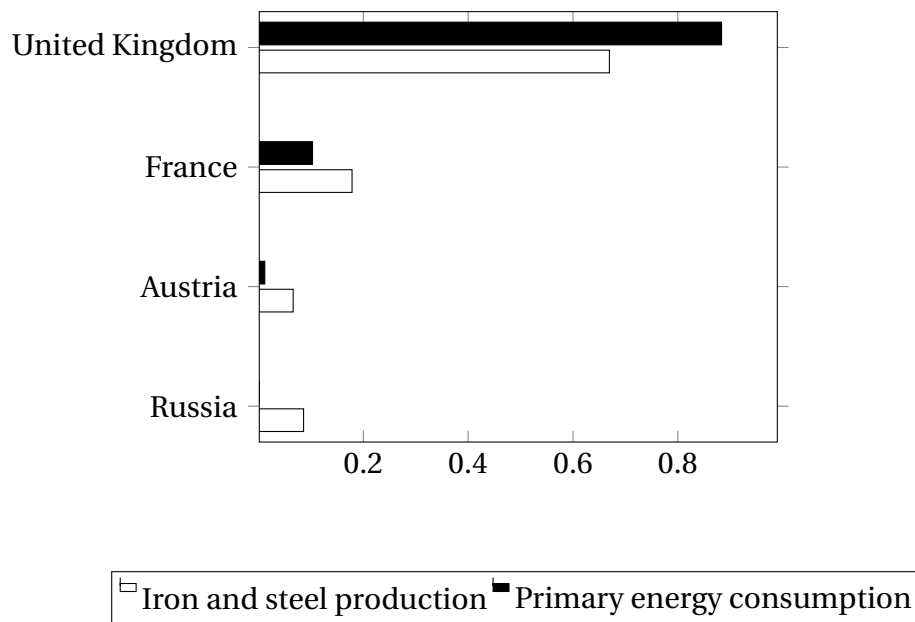
Figure 3: Relative average iron and steel production and primary energy consumption (COW) of main actors in world politics for the period 1816–1859. Countries are ordered according to their average degree of democracy (Polity IV) in the same period.

had a long period of mild conservatism which ended only with the revolution of 1848. The revolution brought back universal male suffrage, which was then abolished by the first democratically elected government. Voting rights were reintroduced under Luis-Napoleon III, but only nominally, as the government was rather authoritarian (Albrecht-Carrié [4], Ch. 2).

Military In terms of military technology, the United Kingdom was far ahead of other countries. It was the only power to have developed a modern system of public finance, which allowed it to borrow heavily at times of war. It had the most industrialized economy (see Figure 3), and controlled an empire which guaranteed a steady supply of food, raw materials, and personnel (Brewer [5], Ch. 4). Other powers had rather rural economies, and their empires were not comparable to the British one in economic terms. Their military technology was essentially based on their large populations, which were at least three times that of the British (see Figure 4). The British empire grew impressively in this period. Besides seizing a number of French and Spanish colonies as a consequence of Napoleon's defeat, the United Kingdom firmly established its control of India, Australia, and New Zealand. It conquered Java, Singapore, Malacca, Burma, and Hong Kong, and expanded its influence in China (Albrecht-Carrié [4], Ch. 1 and 2). Other powers did not engage in any comparable expansion. Russia and Austria clashed in the Balkans in a sort of cold war. Neither benefited significantly, as the Ottoman Empire was protected by the British and the French. After much struggle, France conquered only Algeria. It attempted to conquer Mexico, but failed (Albrecht-Carrié [4], Ch. 1 and 2).

4.2 The 1860s–1900s

Although not yet comparable to the United Kingdom's, the military strengths of France and the United States improved in the 1860s–1900s. (See Figures 6 and 7.) Their power was further magnified in relative terms, as Austria and Russia lagged behind. The United Kingdom, the United States, and France
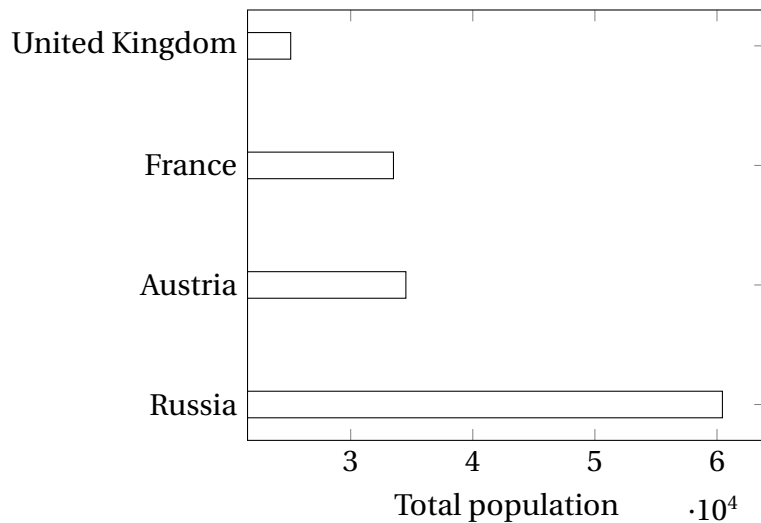
Figure 4: Total population (COW) of main powers for the period 1816–1859. Countries are ordered according to their average degree of democracy (polity IV) in the same period.

were also much more democratic than others, and hence were most likely of hegemonic type. (See Figure 5.) In line with our theory, they all extended the franchise and increased their military expenditure, becoming more powerful and expanding their colonial domains.

Events The Crimean war destabilized the balance of power established at the Congress of Vienna ([34], Ch. 4). The disagreement between the leading powers allowed minor ones to grow stronger. Italy, Germany, and Japan unified their territories in the 1860s–1870s. As a consequence of the rise of Germany and Italy, Austria lost most of its power. Russia was challenged too, having lost the Crimean war and being now severely behind in terms of economic development. The decline of Russia became evident with its defeat in the Russo-Japanese war (Albrecht-Carrié [4], Ch. 3). While autocratic countries were lagging behind, democratic ones grew stronger, at least in relative terms. The United Kingdom consolidated its hegemonic status, guaranteed by its control of the seas via the Royal Navy. France, which had slowly recovered from the
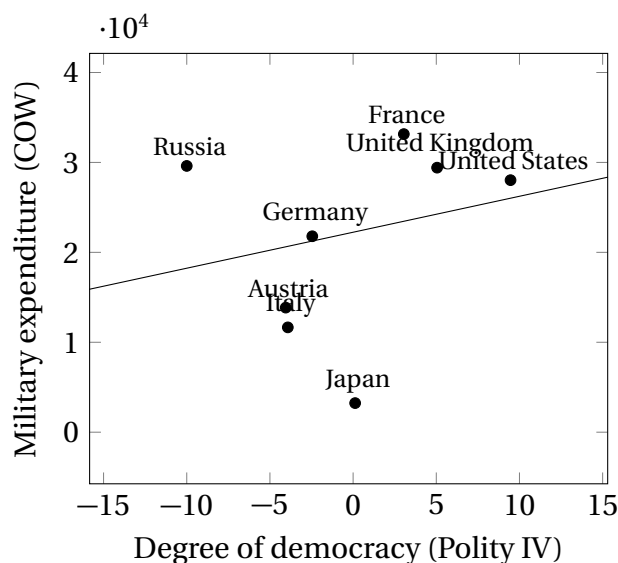
Figure 5: Average degree of democracy (Polity IV) and average military expenditure (COW) of main actors in world politics for the period 1860–1900.

defeat of 1815, reemerged as a true leading power in this period. Their dominant role was, however, increasingly challenged by the United States, which had become an industrial power and established democracy.

Democracy The main democratic reform of this period was perhaps the democratization of France, which introduced universal male suffrage in 1875. While previous reforms were only nominal, this was real, as serious checks and balances on the executive were put in place (Albrecht-Carrié [4], Ch. 5). The United Kingdom became more democratic (see Figure 5), as it undertook further franchise extensions in 1867 and 1884 which eventually gave voting rights to 60% of adult males (Evans [11], Ch. 6 and 8). The United States's parliament had substantial power since its foundation in 1789, but only wealthy white men had voting rights. Property requirements were progressively removed over time, and roughly all white men in the United States were enfranchised by the end of the 1860s. Racial limitations to voting rights were formally removed in 1870 (Keyssar [21], Ch. 8). Russia and Austria remained
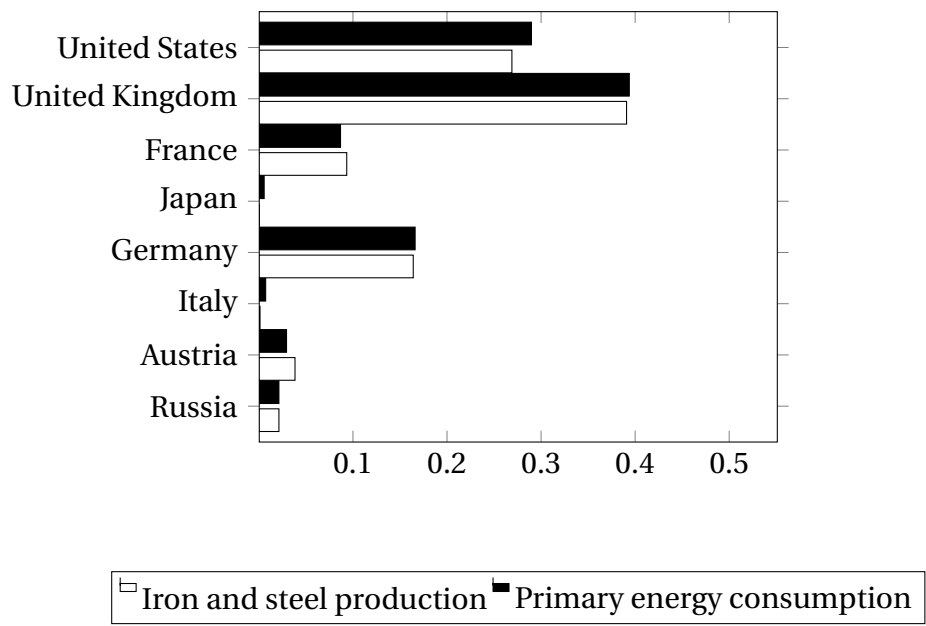
Figure 6: Relative average iron and steel production and primary energy consumption (COW) of main actors in world politics for the period 1860–1900. Countries are ordered according to their average degree of democracy (Polity IV) in the same period.
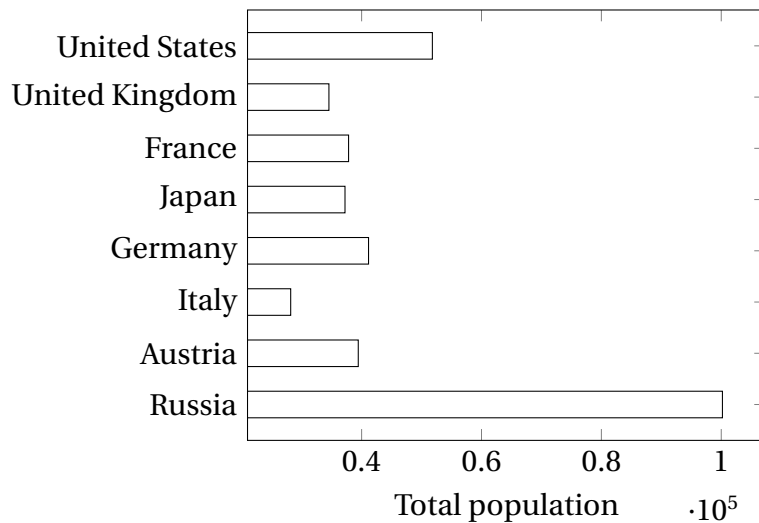
Figure 7: Total population (COW) of main powers for the period 1860–1900. Countries are ordered according to their average degree of democracy (Polity IV) in the same period.

conservative autocracies (see Figure 5). Germany unified in 1871, after much struggle against Austria. The new German parliament was elected by universal male suffrage, but legislation required consent of states' representatives. As most states had a very limited suffrage, power remained in the hands of local aristocracies. The unifications of Italy and Japan were similar to the German. They all reacted to foreign influence. They engaged in massive economic and social reforms, but the elite remained firmly in power (Albrecht-Carrié [4], Ch. 5).

Military At the end of the 19th century all powers had acquired modern systems of public finance. Financial markets had become increasingly competitive in the second half of the century; hence minor powers without political influence could borrow freely (Ferguson [14], Ch. 1).[10] Military technol-

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[10]This was not the case in the first half of the 19th century, as high finance was essentially monopolized by the House of Rothschild (Ferguson [13], Ch. 10).

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ogy changed drastically in this period. The development of the railway and of semi-automatic weaponry allowed relatively small armies to keep large territories and populations under control (Grant [16], Ch. 1). This boosted colonization, and all leading democracies engaged in territorial expansions. Since the reforms of 1875, a series of democratically elected governments led France into a ruthless colonial campaign, conquering large territories in Africa and Asia (Albrecht-Carrié [4], Ch. 4). Within a decade France acquired complete control of Vietnam and Laos, and a number of enclaves in China. Later, it established colonies also in the South Pacific, including New Caledonia and French Polynesia. Tunisia became a French protectorate in 1881, and gradually French control grew to encompass most of North, West, and Central Africa (Albrecht-Carrié [4], Ch. 4). The colonial expansion of the United Kingdom was at least as impressive. In a few decades it conquered Egypt, Sudan, South Africa, and Rhodesia, and formalized the annexation of India. Moreover, it consolidated its control of the seas, establishing an "informal empire" which included Argentina, China, and Siam (Albrecht-Carrié [4], Ch. 4). Similarly, the United States gained control of Hawaii and a series of former Spanish colonies, including Cuba and the Philippines (Zinn [42], Ch. 12). Austria and Russia, the least democratic countries among the leading powers, did not achieve major military successes. Their most notable achievements were in the Balkans, supporting the independence of former Ottoman provinces. Germany, Italy, and Japan, only slightly more democratic, did not significantly expand their territories (Albrecht-Carrié [4], Ch. 4). The only exceptions were Japan's acquired hegemony in Manchuria and Korea, the Italian first conquests in Libya, and a rather modest German Empire, which included Tanganyka, Cameroon, Togoland, Samoa, and Micronesia (Albrecht-Carrié [4], Ch. 4).

4.3 The 1910s–1940s

In the 1910s–1940s, the United States and the United Kingdom were the most established democracies and among the strongest (see Figures 8 and 9), and hence were arguably of hegemonic type. In line with our predictions they

extended the franchise and increased their military expenditure, expanding their colonial domains and cementing their dominant positions.

Events The leading powers of this period were roughly the same as the ones of the late 19th century, but their relative strengths had changed (see Figure 8). The United States had the strongest economy by far. Germany reached the same industrial levels as the United Kingdom. Russia grew stronger, but was not an industrial power yet. France lagged behind in terms of industrial development, while Italy and Japan were catching up, so the economies of these three became comparable. Thanks to their large empires, however, the United Kingdom and France maintained a military head start, at least until WWI (Albrecht-Carrié [4], Ch. 6). As these old powers resisted sharing privileges with the emerging ones, their confrontation escalated in two major conflicts, WWI and WWII. While the democratic powers were successful in both wars, most autocratic powers were defeated (Albrecht-Carrié [4], Ch. 7 and 10).

Democracy The United Kingdom and the United States became even more democratic in this period (see Figure 9). The United Kingdom gave voting rights to all adult males and around 40% of adult females in 1918, and to all adult females in 1928. Similarly, the United States extended the franchise to all adult females in 1920 (Phillips [30], Ch. 1). France remained democratic, but did not engage in further democratic reforms. After a brief democratic period between the Russo-Japanese war and WWI, Russia experienced the October Revolution of 1917 and turned into a totalitarian state. Germany extended voting rights to all adult women in 1918 and in other ways became increasingly democratic during the 1920s. The rise of National Socialism, however, quickly reversed these reforms, transforming the country into a totalitarian state. Women's suffrage was partially introduced in Italy in 1925. More generally, Italy became briefly democratic in the 1920s, but then turned totalitarian in the 1930s. Like Germany and Italy, Japan had a brief period of democracy in the 1920s, but then became increasingly controlled by the military (Hobsbawm [20], Ch. 1 and 2).
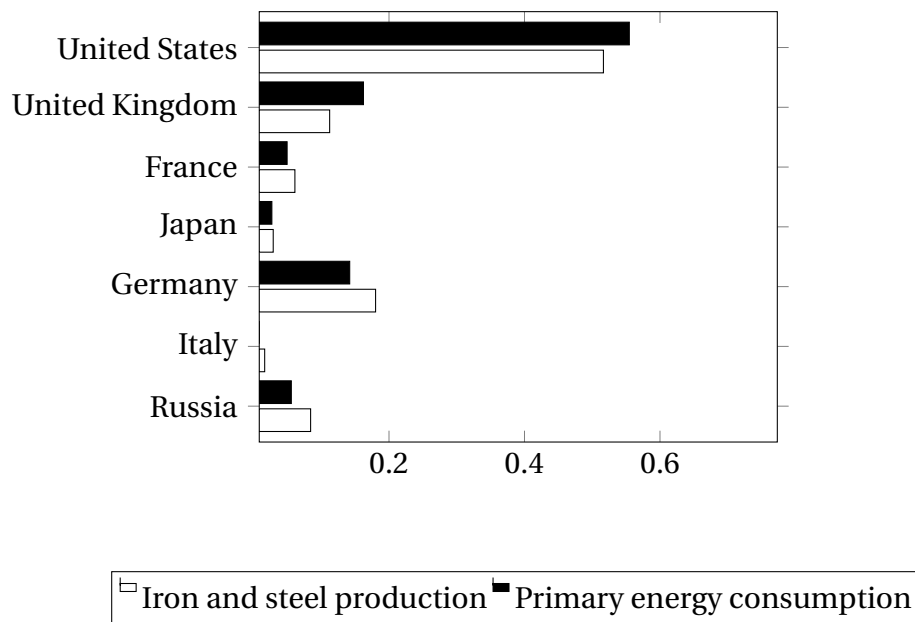
Figure 8: Average relative iron and steel production and primary energy consumption (COW) of main actors in world politics for the period 1901–1945. Countries are ordered according to their average degree of democracy (Polity IV) in the same period.
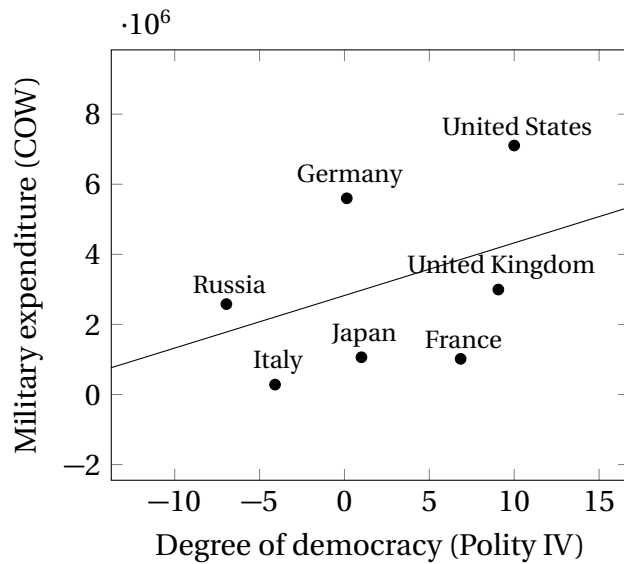
Figure 9: Average degree of democracy (Polity IV) and average military expenditure (COW) of main actors in world politics for the period 1901–1945.

Military WWI saw the United States, the United Kingdom, Italy, France, Russia, and Japan fighting against Germany, Austria, and the Ottoman Empire. Ideological issues aside, this was a war concerned with the growing ambitions of Germany, and its main prizes were the territories of the declining Ottoman Empire (Fromkin [15], Ch. 1). At the end of the conflict all European powers were exhausted, their economies destroyed and their finances in red. Conversely, the United States established itself as one of the strongest powers. Most European powers held large debts with American banks (Albrecht-Carrié [4], Ch. 9). The United Kingdom and France were consumed, but their efforts were generously rewarded. They conquered and shared the Middle East, with the United Kingdom getting most of it. Austria and Russia, which had wrestled for Ottoman territories through all the 19th century, were essentially left empty-handed. Moreover, Austria lost all of its empire and Russia collapsed into a civil war. Germany was stripped of its few colonies, which were given to the British and the French, and had to pay massive war repara-
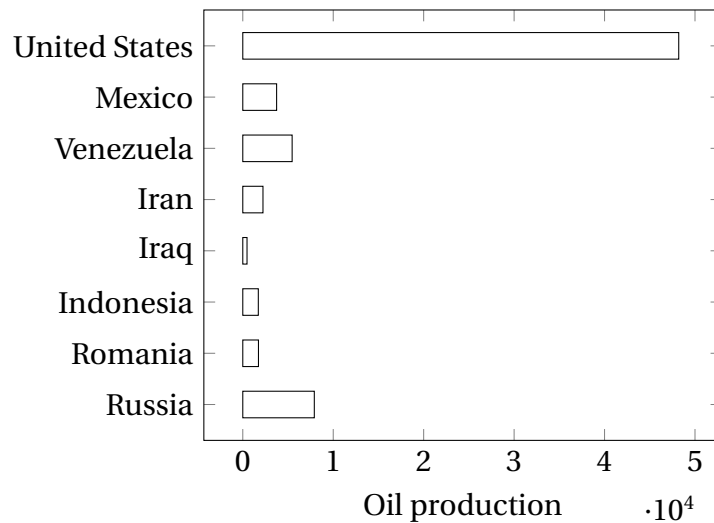
Figure 10: Total oil production (TSP data portal) of main oil producers for the period 1901–1945.

tions. Italy and Japan remained largely unrewarded (Fromkin [15], Ch. 38 and 61). Again, democratic countries had gained the most. The nature of warfare changed rapidly after WWI. Combat vehicles such as warships, submarines, tanks, and airplanes were developed and improved. Innovation exploded toward the end of the 1930s (Maiolo [26], Ch. 1). As all this new machinery required combustibles to run, a safe supply of oil became crucial. The United States and Russia had large oil reserves, and therefore were self-sufficient (see Figure 10).[11]

The United Kingdom had acquired exclusive extraction rights in the Middle East, as a consequence of WWI. France was significantly less well endowed, but entitled to a share of British oil as a reward for its efforts in WWI. Con-

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[11]While American oil had always been owned by American companies, most Russian oil was owned by the Swedish Nobels until WWI. Russian oil was then nationalized by the Bolsheviks. The Nobels managed to sell half of their shares to Standard Oil of New Jersey shortly before the nationalization. Standard Oil of New Jersey had bet that the revolutionary government would not last, but turned out to be wrong (Yergin [40], Ch. 6).

versely, Germany, Italy, and Japan were essentially dependent on oil imports from these powers, or from producers under their control (Yergin [40], Ch. 16–19). Thus WWII can be seen as a war of countries with oil (United States, United Kingdom, France, and Russia) against countries without oil (Germany, Italy, and Japan).[12] Interestingly, three out of four countries with oil were democratic, while all countries without oil were autocratic.

4.4   The 1950s–1980s

The United States and Russia had military technologies significantly superior to those of all other countries in the 1950s–1980s, and the US was more democratic. (See Figures 11, 12, and 13.) The United States was therefore of hegemonic type. As our theory predicts, it extended the franchise and increased its military expenditure and power.

Events In this period world's politics were essentially dominated by two superpowers: the United States and Russia (Young and Kent [41], Ch. 1). Their status was determined by their heavy industry and autonomous oil supplies, the two key ingredients of military technology. (See Figures 12 and 13.) No other country had comparable endowments. Western Europe and Japan were advanced industrialized economies, but lacked a safe supply of oil. Saudi Arabia had enormous oil reserves, but lacked the heavy industry. China gradually emerged as an important economic actor, but still played a very marginal role in world politics. The two superpowers wrestled for half a century, dividing the world into spheres of influence. Ultimately Russia collapsed in the late 1980s, leaving the United States as the unquestioned hegemonic power. Again, a democracy had won.

Democracy The United States, the United Kingdom, and France remained strongly democratic (see Figure 11). Moreover, the United States extended

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[12]Clearly, as oil was vital to warfare, countries without oil were ultimately defeated. Hitler's obsession with conquering the oil-rich Caucasus and the Japanese venture to seize Indonesian wells were rather desperate attempts to overcome the issue (Yergin [40], Ch. 16–19).
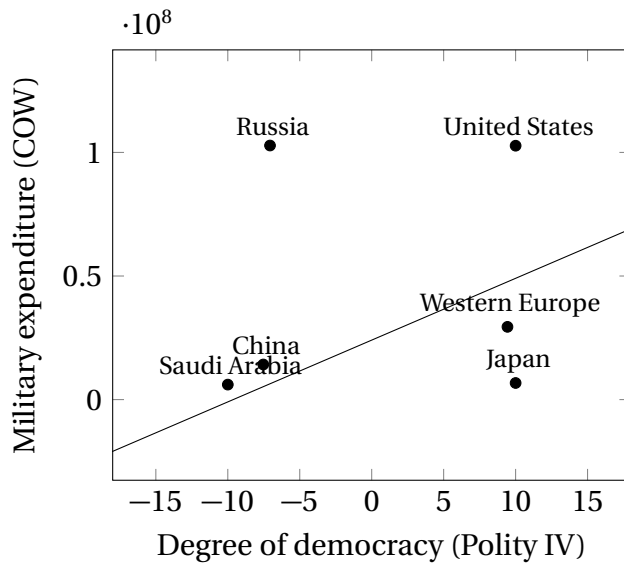
Figure 11: Average degree of democracy (Polity IV) and average military expenditure (COW) of main actors in world politics for the period 1946–1990. The data for Western Europe is the sum of military expenditures and the average degree of democracy of Italy, France, Germany, and the United Kingdom.

the franchise further in the 1960s–1970s via a series of amendments which homogenized barriers concerning taxation (1964, 1966), age (1971), and residence (1972) which where particularly restrictive in some states. Germany, Italy, and Japan, after having experienced totalitarian regimes in the 1930s, became stable democracies after WWII. These reforms were, however, at least partially imposed by the winners of WWII. In a similar fashion, France extended voting rights to women in 1944 by ordinance of the French Committee of National Liberation. Russia maintained the same totalitarian regime of the pre-WWII period. The two new emerging powers, Saudi Arabia and China, were highly autocratic (Hobsbawm [20], Ch. 8).

Military WWII radically changed the world's balance of power. Germany, Italy, and Japan were absolutely defeated, and lost their military ambitions. Although formally on the winning side, the United Kingdom and France were
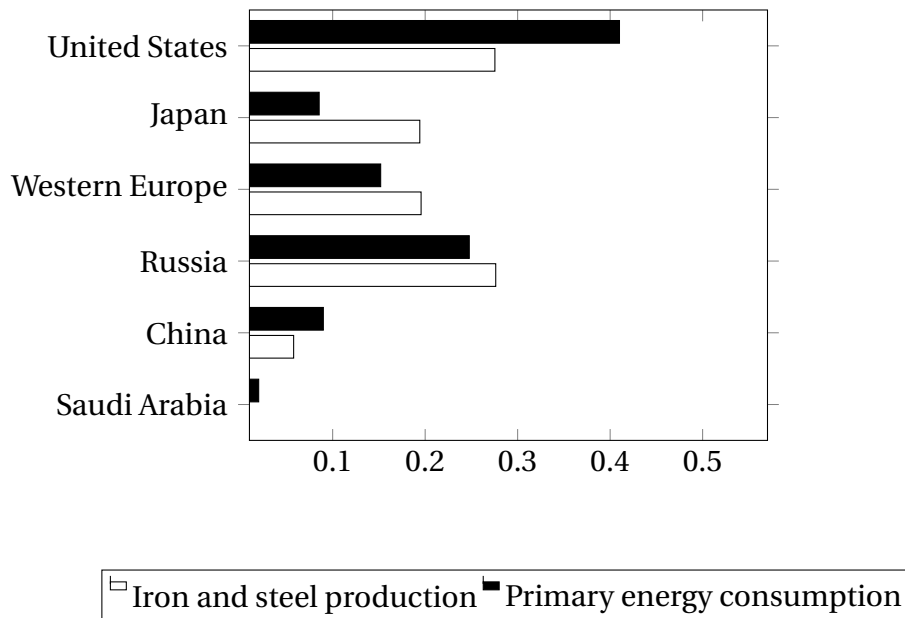
Figure 12: Average relative iron and steel production and primary energy consumption (COW) of main actors in world politics for the period 1946–1990. Countries are ordered according to their average degree of democracy (Polity IV) in the same period.

equally ruined. Almost all their colonies rebelled and declared independence during the 1940s–1960s. Along with the colonies, the United Kingdom and France lost most of their guaranteed oil supplies (Yergin [40], Ch. 21). Realizing their own weakness, western European countries (Germany, France, Italy, and the United Kingdom) started to cooperate more closely, laying the foundations of the European Union. Given the poor state of Europe and Japan, the United States and Russia emerged as the only military powers. No other country had both oil and heavy industry in comparable magnitudes (see Figures 12 and 13).

These two powers never fought each other directly, but instigated and supplied conflicts all around the world to increase their spheres of influence (Young and Kent [41], Ch. 6). Western Europe and Japan gradually reemerged as lead-
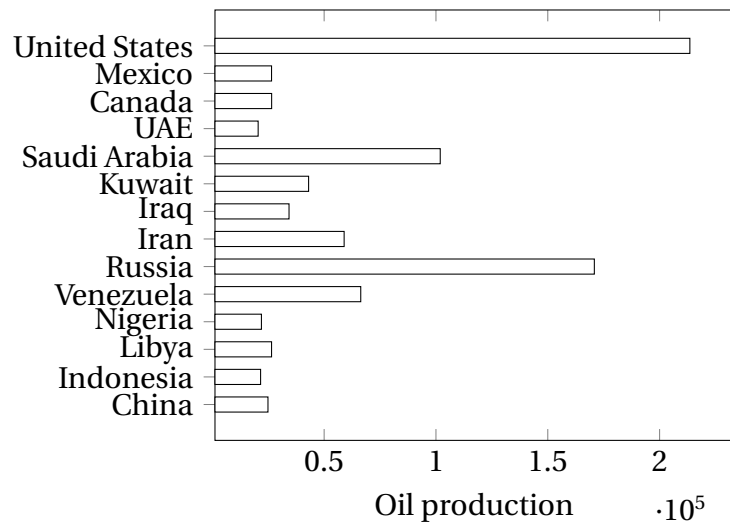
Figure 13: Total oil production (TSP data portal) of main oil producers for the period 1946–1990.

ing industrial economies. Their dependence on oil imports, however, severely limited their political strength. Saudi Arabia and China emerged as minor powers in the 1970s. After WWII, Saudi Arabia had quickly become one of the world's largest oil producers, but lacking an industrial economy it could not become a military power. It gained immense political influence, however, on the United States, Western Europe and Japan by threatening to cut their oil supplies (Yergin [40], Ch. 29). China had the world's largest population and, although far from being industrialized, had a growing economy and an independent foreign policy. Its true potential would emerge only later, in the 1990s–2000s.

5   Concluding remarks

We owe modern democracy, at least in part, to the desire on the part of elites to wage war more effectively. This insight contrasts with theories such as that of Acemoglu and Robinson [1] that see franchise extension as the response of

elites to threats of insurrection internal to a nation.

But it also contrasts with a large theoretical literature on democracy that focuses on its appealing properties as a political system once it is in place (see, e.g., Dahl [8]), while rarely touching on the issue of why we ever should expect it to appear, or why it should be stable. There are at least two problems with restricting attention to normatively pleasing aspects of democracy. One is that, given that a transition from a less inclusive political system to a more inclusive one is going to remove some privileges originally enjoyed by the incumbent elite, it is not clear how it could ever happen. Changes do not come about simply because an outside observer might think them desirable. A second problem is that losing sight of the outside option makes us unable to explain deviations from the normative ideal. As pointed out by, e.g., Buchanan [6], any stable social contract must make all participants at least as well off as they would be by defecting from it. That is, the default option of outright conflict reasonably puts restrictions on what is achievable within a political system.

It is our hope that in this paper we have helped to shed some further light on the issue of the forces leading to democratization, and on the issue of what makes democracy stable.

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