Nation-Building, Nationalism and Wars*

Alberto Alesina
(Harvard and Igier)

Bryony Reich
(Northwestern)

Alessandro Riboni
(Ecole Polytechnique and Crest)

May 2017

Abstract. The increase in army size observed in early modern times changed the way states conducted wars. Starting in the late 18th century, states switched from mercenaries to a mass army by conscription. In order for the population to accept to fight and endure war, the government elites began to provide public goods, reduced rent extraction and adopted policies to homogenize the population with nation-building. This paper explores a variety of ways in which nation-building can be implemented and studies its effects as a function of technological innovation in warfare.

Keywords: Interstate Conflict, Public Good Provision, Nationalism, Military Revolution, Nation-Building.

* We are grateful to Hector Galindo-Silva, Mickael Melki, Jean-Baptiste Michau, Kenneth Shepsle, Romain Wacziarg, and seminar participants at several institutions for valuable feedback. We thank Igor Cerasa and Matteo Ferroni for research assistantship.

1. Introduction

The interplay between war and the fiscal capacity of the state is well known.[1] However, guns are not enough to win wars; one also needs motivated soldiers. In modern times, the need for large armies led to a bargain between the rulers and the population. The elite had to make concessions to induce citizens to comply with war related demands. Rulers promoted nationalism to motivate citizens and extract "ever-expanding means of war - money, men, materiel, and much more - from reluctant subject populations" (Tilly, 1994; see also Levi, 1997).

The "ancient regimes" in Europe used to fight wars with relatively small armies of mercenaries, sometimes foreigners, paid out with the loots of war. As a consequence of the evolution of warfare, countries changed the conduct of war, switching from mercenaries to mass armies recruited or conscripted almost entirely from the national population. Roberts (1956) explained how warfare underwent a "military revolution" starting between 1560 and 1660 and reaching a completion with the "industrialization of war" (McNeill, 1982) that occurred in the nineteenth century.[2] The source of this revolution was due to changes in tactics and weapons, such as, the use of gunpowder technology and the invention of new styles of artillery fortification, higher population growth, changes in communications and transport technology which allowed states to put a large army in the field, and the adoption of techniques of mass weapon production. The electromagnetic telegraph, developed in the 1840s, allowed the deployment and the control of the army at distance. Steamships and railroads moved weapons, men and supplies on an entirely unprecedented scale (Onorato et al., 2014). In the middle of the 19th century, the adoption of semiautomatic machinery to manufacture rifled muskets made it possible, and relatively affordable, to equip a large number of soldiers (McNeill, 1982, p. 253). As a result, the size of armies increased and, as Clausewitz (1832) put it, "war became the business of the people".[3]

[1]Among others, Brewer (1990), Tilly (1990), and Besley and Persson (2009).

[2]Roberts (1956), Tallett (1992), Rogers (1995) and Parker (1996) study innovations in warfare in the early modern period. For more recent developments, see McNeill (1982) and Knox and Murray (2001).

[3]According to Finer (1975) the number of French troops called up for campaigns was 65,000 (in 1498), 155,000 (in 1635), 440,000 (in 1691), and 700,000 (in 1812). In England and Prussia, which were less populous countries than France, armies were smaller but nevertheless impressive relative to the population size. For instance, in 1812 Prussia sent 300,000 soldiers (equivalent to about 10 per cent of the population) to war (Finer, 1975, p. 101). These figures increased dramatically in the 20th century: during WWI, 8 millions of soldiers were recruited in France (Crepin, 2009, and Crepin and Boulanger, 2002).

This paper examines nation-building in times of war. Mass warfare favored the transformation from the ancient regimes (based purely on rent extraction) to modern nation states in two ways. First, the state became a provider of mass public goods in order to buy the support of the population. Second, the state developed policies geared towards increasing national identity and nationalism. In particular the states had to hold in distant provinces to avoid the breakdown of the country, which would have interfered with war effort, and to motivate soldiers and civilians located far away from the core of the country. In addition, nation-building in times of war also included aggressive negative propaganda against the enemy and supremacy theories.

When the armies had to increase in size, the elites needed to build tax capacity. This is a well studied point as we argued above, and we return to it at the end to close our argument. We focus here on a different issue, the selection on how to spend fiscal revenues to motivate the population to endure wars. The composition of spending is quite relevant. For instance Aidt et al. (2006) argue that total spending as a fraction of GDP did not increase that much in the 19th century up until WW2. What mostly changed was the composition of the budget: in the 19th century and early 20th century, spending on defense and policing was partly substituted by spending on public services (transport, communication, construction) and later on public provision of public goods (education and health).[4]

The citizens face punishment from illegally avoiding conscription and the soldiers from defecting or cowardice; however it is hard to imagine that wars can be won by soldiers who are fighting only to avoid punishment and citizens who are uncooperative. So, when war became a mass enterprise, the elites had to reduce their rents and spend on public goods which were useful to the populations. On this point, Levi (1997, p. 204) writes that citizens' voluntary "compliance [with conscription] is a quid pro quo for services provided by the government." Along similar lines, Tilly (1990, p. 120) writes that in order to mobilize resources for war states had to bargain with their subject population and concede rights, privileges, services and protective institutions: in Europe at the end of the 19th century, "central administration, justice, economic intervention and, especially, social services all grew as an outcome of political bargaining over the state's protection of its citizens." In other words the citizens and soldiers have to believe that a loss in the war would imply a loss of

[4]As reported by Table 5 in Aidt et al. (2006), on average in Europe, defence, judiciary and police accounted for 59.7 per cent of total spending in 1850-1870, and 30.5 per cent in 1920-1938.

useful national public goods and services provided by their government, which they learned to appreciate because of nation-building. With heterogenous populations, governments used indoctrination (via, for instance, education policies) to homogenize the population within the state, instill patriotism and increase the value of common public goods and a common language.[5] Soldiers from regions without any national identity do not put much effort in fighting or may even break away to join the enemy since their national identity is nil.[6] National sentiments may be "positive" in the sense of emphasizing the benefit of the nation, or "negative" in terms of aggressive propaganda against the opponent. When states have low fiscal capacity and thus cannot provide mass public goods to increase positive nationalism, their only option is negative nationalism and supremacy theories.

Our paper is related to several others and some of our results are consistent with the historical arguments presented above. Acemoglu and Robinson (2000) argue that elites gave concessions in response to internal threats of revolutions. In this paper we argue that concessions occurred also, perhaps mainly, as a response to external threats. Moreover, while they focus on democratization, we focus on nation building. Whether the main motivation for the elite's concessions were internal or external threats may vary in different cases and it is worth further investigation. Our theory is also complementary to the work of Lizzeri and Persico (2004), who show that the expansion of voting rights, by increasing the electoral value of policies with diffuse benefits, has determined a shift from pork-barrel politics to public good provision. Alesina et al (2017) consider nation-building but they do not consider wars. They focus on the incentive to nation-build as a response to democratization which in non homogenous countries would lead to (threats of) secessions. Democratization and external threats may in fact interplay and exacerbate the need to "nation build". In Besley and Persson (2009, 2011) wars give rulers the incentive to build an effective state that can successfully tax its citizens in order to finance military expenses. However, as pointed out by Gennaioli and Voth (2015), governments have always been subjects to external threats. Before the era of modern states, this threat did not lead to the creation of strong and centralized states. The effect of wars on state capacity seems a more recent phenomenon. Their explanation is that

[5]States sometimes homogenize the population thorugh mass killings and forced displacements. This possibility, which is not considered in this paper, is studied in Esteban *et al.* (2015).

[6]For instance Weber (1976, p. 101) describes episodes of hostility of French border regions towards the national army during the 1870 war against Prussia.

before the military revolution, the probability of winning a war was somewhat independent on fiscal resources. In the modern era, instead, they argue that the odds of the fiscally stronger power winning a conflict increased dramatically, thus giving strong incentives to build fiscal capacity. Gennaioli and Voth (2015) model the military revolution as an increase of the sensitivity of the war outcome to fiscal revenues. In our paper, it is modeled as an increase of the size of the army. Aghion et al. (2014) study which regime (democracy or autocracy) invests more on education. They also investigate whether spending in education is related to external threats.[7] Their model is different from ours in several respects. They do not focus on government spending per se (they only focus on education) and more importantly they do not model the mechanism through which spending can increase the effort in the conflict. The paper is obviously also related to the literature on conflict, e.g., Jackson and Morelli (2007). In the model by Esteban and Ray (2001, 2011) there is an exogenous parameter which determines the importance of the public and private good components in the conflict. In our model, the relative publicness of the conflict is endogenous and is a choice of the elite.

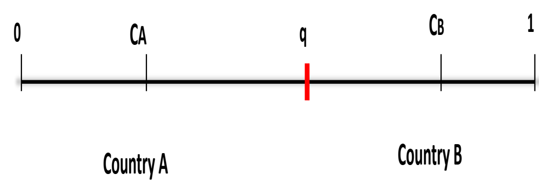
The paper is organized as follows. Section 2 presents the basic structure of the model and examines the working of it in peace. Section 3 considers the situation of war between the two countries. Section 4 discusses the elite's trade-off between providing public goods and paying the soldiers with monetary transfers. Sections 5-6 study various forms of nation building, including nationalism and propaganda. Section 7 discusses endogenous taxation. The last section concludes. All the proofs are in the Appendix

[7]For a discussion of education policies as instruments of cultural homogenization, see Weber (1976, ch. 18), Posen (1993), Bandiera et al., (2016) and Darden and Mylonas (2016).

2. Peace

The world consists of two countries, A and B, for the moment with no war. Country A is represented by the linear segment $[0, q]$ and country B by the segment $(q, 1]$. We let $C_A \in [0, q]$ and $C_B \in (q, 1]$ denote the location of the "capitals" of the two countries as in Figure 1. In each country, there are two types of individuals: the members of the elite and the ordinary citizens. The elite has measure s_j in country $j = A, B$. Ordinary citizens have measure q in country A and $1 - q$ in country B. Each individual has a specific "location". All members of the elite are located in the "capital", where the public good is provided, while citizens are uniformly distributed over the country. Each country is run by its own elite and the latter is not threatened by internal revolutions. The elite controls the tax revenue, engages in rent-extraction and may choose to provide a certain amount of the public good and nation building. More on this below.

Figure 1: The two countries



Income and taxes are exogenous. We show below how to generalize our model to endogenous taxation; for now we focus on the issue of how to allocate the tax revenues. In country j all individuals, including the elite, receive a fixed income y_j. Ordinary citizens (but not the elite) pay a tax t_j. This could be easily generalized to elites paying taxes and/or having higher income, with no gain of insights and with more notation. When A and B are not in conflict, there is no linkage between the two countries and, consequently, policies in B have no effect on A so that we can completely disregard country B. In other words the peace equilibrium in country B could be computed exactly as we do for country A.

The citizens and the elite derive utility from private consumption and from the public good. In country A the utility of an individual located at $i \in [0, q]$ is

$$U_{i,A} = \theta g_A (1 - a\,|i - C_A|) + c_{i,A}. \tag{1}$$

where g_A denotes the public good that is provided in the capital of country A. Consumption of an ordinary citizen in country A is $c_{i,A} = y_A - t_A$, while consumption by a member of the elite is

$$c_{e,A} = y_A + \phi_A, \tag{2}$$

where ϕ_A are the endogenous rents.

As in Alesina and Spolaore (2003), the public good has a geographical and a preference interpretation: it is located in the country's capital and individuals located close to the capital benefit more from the public good. The proximity can be interpreted as geographical or in terms of preferences, culture, or language. The parameter θ is the marginal benefit of public spending for an individual at zero distance from it, $|i - C_A|$ is the distance of individual i from the location of the public good and a is the marginal cost of distance. A low (respectively high) value for the parameter a captures homogeneity (respectively heterogeneity) of preferences within the country. We assume $a < 1$ so that everybody's utility is increasing in the public good.

We also assume that the government has access to an homogenizing (nation-building) technology. The latter makes the public good more attractive to individuals who are far away from it. In other words, "homogenized" citizens feel like members of the nation rather than of their specific village, region, ethnic or religious groups. States homogenize the population by creating state-controlled educational systems, promoting national symbols and traditions, celebrating the cultural roots in national museums, using print-based media and so on. Nation-building can also be achieved in other ways, such as, building roads (or railroads or airports) in order to reduce the costs of distance from the capital or teaching a common language (the one spoken by the elite in the capital) so that individuals can better communicate with the government and access public services. Homogenization can take a variety of odious forms such as, prohibiting local culture, repression or even genocide. In our model, however, we do not consider genocide since the size of the population is constant.

The variable $\lambda \in [0, 1]$ denotes the homogenization policy (or indoctrination, terms which we will use interchangeably) while h is the linear cost of it. Homogenization changes individual preferences by shifting the ideal point of an individual "located" at i and bringing it closer to C_A:

$$(1 - \lambda)i + \lambda C_A. \tag{3}$$

Thus the higher is λ, the more the citizens benefit form the public good provided in the capital. We assume that the citizens do not (or cannot) resist homogenization. Future research may address this case as well.

The share of $t_A q$ (the tax revenue) that is appropriated by the elite as political rent is $(1-\pi_A) \in [0,1]$ and is derived endogenously below. If $\pi_A > 0$, the tax revenue is partly used to either provide the public good or to "nation build" (financing a positive λ). The budget constraint of the government is given by

$$\pi_A t_A q = g_A + h\lambda. \tag{4}$$

The elite is located in the capital. Each member of the elite has the following utility which is maximized under the budget constraint above:

$$U_{e,A} = \theta g_A + y_A + \frac{(1-\pi_A)t_A q}{s_A}. \tag{5}$$

The last term of (5) is given by ϕ_A, the political rents appropriated by each member of the elite (of measure s_A). Note that the utility of the elite is not affected by λ since the elite is already located in the "capital" (i.e., they have the public good which they like). Then, clearly the elite sets $\lambda = 0$ since homogenization is costly. Given the linearity of (5) it immediately follows that the elite either invests all tax revenue in the public good or diverts all tax revenue as rent.

Proposition 1: *For all parameters values, $\lambda = 0$. When*

$$1 - s_A\theta > 0, \tag{6}$$

the elite chooses to have no public good and the entire tax revenue is appropriated as rents. When instead (6) does not hold, the elite does not extract rents and chooses maximal spending in public good – i.e., we have $g_A = t_A q$.

Condition (6) implies that if the elite's measure s_A is relatively small and if the benefits of the public good are not extraordinarily large (small θ) then the elites prefer extracting rents rather than delivering public goods (such as, roads to the provinces or public education) which benefit every one, including the elite.[8] This captures the case of the ancient regimes: small elites and small public sectors (with not many public goods) except possibly in case of wars, as we shall see. Throughout the rest of the paper we assume that (6) holds. Thus:

Assumption 1: $1 - s_A\theta > 0$.

3. The Model of War

3.1. The Determinants of Victory: War Effort

We now study a conflict between country A and B without modelling why a conflict erupts.[9] The elite does not fight and the proportion of ordinary citizens fighting in the war is $\chi \in [0,1]$ in both countries.[10] Therefore, the size of the army in country A and B is χq and $\chi(1-q)$. We assume that the army fully represents the heterogenous population in the country. That is, the elite cannot selectively send to the front citizens on the basis of their location. The citizens cannot resist to being called to the army. These could be interesting extensions of our model for future research. The parameter χ plays a key role in our analysis; an increase in χ captures the evolution of military technologies which we described in the introduction.

The defeated country loses its sovereignty and its capital becomes the capital of the winning country; the losing country forgoes its entire tax revenue to the winner. If country A wins, for instance, the tax revenue raised in country B is shared between A's elite and A's soldiers according to the proportions $1 - \gamma_A$ and γ_A, respectively derived endogenously. This is of course an extreme case; we could model partial loss of sovereignty with additional notation but without affecting the thrust of our results.

Each soldier in A exerts effort e_A, derived in Section 3.3. Total effort in country A is therefore $\chi q e_A$. Effort in country B is taken as exogenous and set equal to $\chi(1-q)e_B > 0$. The probability of victory of a country is given by the ratio between the war effort of that country and the sum of efforts by A and B. The probability of country A winning is given by:

$$P_A(e_A, e_B) = \frac{\chi q e_A}{\chi q e_A + \chi(1-q)e_B} \tag{7}$$

[8] If utility were not linear in g_A, public good provision would not be necessarily zero (see Appendix). Linearity is assumed to keep the analysis tractable.

[9] The thrust of our results would not change if a conflict is expected to arise with some probability.

[10] This could be generalized with no major insight but cluttering the notation.

In our model the probability of winning depends on soldiers' effort and motivation. Needless to say, in reality the probability of victory depends upon not only the effort of the soldiers but also their guns. More generally, we could have assumed that the military strength of a country is the product of two inputs, soldiers' effort and guns, and that the cost of effort is reduced by having more efficient guns. In this case, the effort of the soldiers would increase with the quantity and quality of military equipment, so that effort may also be taken more generally as a catchall term for having a more efficient army.

The timeline is as follows. First, the government of country A chooses the policy vector $(\pi_A, g_A, \lambda, \gamma_A)$ subject to (4) and given $e_B, t_{B,}g_B > 0$.[11] Second, war effort e_A is chosen. Finally, the winner of the conflict is determined, and individuals' payoffs are computed according to the policy choices selected at the beginning of the game. We will solve the game backward by first computing the war effort in A (Section 3.3) and then solving the elite's problem.

3.2. Citizens' and Elite's Payoffs

Consider an ordinary citizen $i \in [0, q]$ who is a soldier in country A. His utility in case of victory and defeat is denoted, respectively, by $U^+_{i,A}$ and $U^-_{i,A}$. Using (1) and (3):

$$U^+_{i,A} = \theta g_A - \theta g_A a \left|(1-\lambda)i + \lambda C_A - C_A\right| + y_A - t_A + \gamma_A \frac{t_B(1-q)}{\chi q} \tag{8}$$

The first terms in (8) are as in peace. The last term is the "pay" that each soldier receives out of the spoils of war. In case of victory a proportion γ_A of the tax revenue of B is distributed among A's private soldiers, whose measure is χq. If country A is defeated, the capital of country A moves to C_B. Citizens continue to pay taxes but the tax revenue goes to country B. Then, citizen i's utility is

$$U^-_{i,A} = \theta g_B - \theta g_B a[C_B - (1-\lambda)i - \lambda C_A] + y_A - t_A \tag{9}$$

In writing (9) we have assumed that when the capital moves to C_B, citizens in A evaluate

[11] To make the problem interesting, g_B should not be too large otherwise individuals in A would like to be invaded by country B. Similarly, e_B cannot be too high in order to give soldiers in A the incentive to exert positive effort. Also the size of the two countries cannot be too different otherwise the larger country would win with almost certainty. We discuss these bounds in the Appendix.

the new capital according to their preferences after indoctrination, i.e. for given λ. This implies that homogenization makes the defeat more costly for citizens to the right of C_A because they find themselves with preferences further away from C_B. Instead, citizens to the left of C_A would see their utility in case of defeat increase with homogenization because they are getting closer to C_A but also to C_B. We return to these issues below considering alternative hypotheses regarding this point. In (9) we have also assumed that the elite of the winning country does not homogenize the losers. Homogenization of the losers would be necessary to prevent revolts after the war. We do not model insurrections in this paper; if we did so, homogenization would be useful even in peace.[12] Future research could investigate how the prospects of future insurrections of conquered territories may influence, first, the decision to go to war and then the choice to homogenize after victory.

The utility of each elite member in country A in case of a success and a defeat is denoted, respectively, by $U^+_{e,A}$ and $U^-_{e,A}$.

$$U^+_{e,A} = \theta g_A + y_A + (1-\pi_A)\frac{t_A q}{s_A} + (1-\gamma_A)\frac{t_B(1-q)}{s_A} \tag{10}$$

The last two terms in the above expression are the political rents and the share of loots appropriated by the elite, respectively. The elite's utility of losing is

$$U^-_{e,A} = \theta g_B - \theta g_B a(C_B - C_A) + y_A \tag{11}$$

Payoff (11) assumes (without loss of generality) that the elite continues to not pay taxes in case of defeat.[13]

3.3. Effort Decision

We abstract from the free-riding problem that may arise when individuals choose effort levels in wars. The latter would be extremely severe in a model with a continuum of soldiers given that each soldier would see his contribution to the winning probability as negligible, leading to no effort in equilibrium. Yet, we do observe that soldiers exert a significant amount of effort in many wars. Threat of harsh punishment for cowardice (not modelled here) is certainly a

[12] Note that Alesina et al. (2017) study a model of homogenization without wars.

[13] Assuming that the elite pays taxes in case of defeat would reinforce our results because it gives the elite even stronger incentives to avoid a defeat.

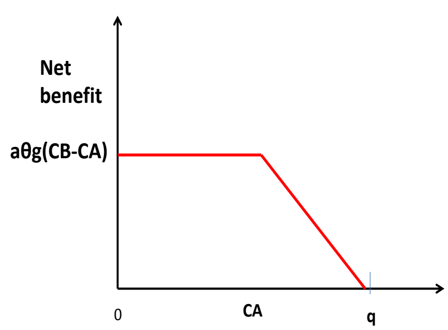
reason but it is not the only one. In this paper we bypass free-riding problems by assuming (1) that all soldiers in A exert the same effort level e_A and (2) that this common effort level is the one that maximizes the average expected payoff of ordinary citizens. In analogy to the concept of rule-utilitarianism by Harsanyi (1980), the idea is that soldiers, regardless of their differences, want to "do their part" by abiding to an effort rule that, when followed by all soldiers, would maximize average utility.[14] The results would be qualitatively unchanged if one assumes that everybody puts in the effort of soldiers with the average or median distance from the capital of country A. Note that homogenization may also be used to remedy a collective-action problem, an interesting extension which we leave for future research.

Given the policy vector $(\pi_A, g_A, \lambda, \gamma_A)$ chosen at the beginning of the game, the effort rule is chosen to maximize the average expected payoff of all citizens. That is,

$$\max_{e_A} \quad \frac{1}{q}\left(\int_0^q U_{i,A}^{-} di + P_A(e_A, e_B)\int_0^q (U_{i,A}^{+} - U_{i,A}^{-}) di\right) - e_A. \tag{12}$$

The last term is the cost of effort, which we assume linear in e_A.

Figure 2: Net benefit of winning



Optimal effort in the conflict depends on the utility that soldiers would get in case of victory relative to the utility in case of defeat. Effort is higher if soldiers perceive a higher net gain from victory. Depending on their location, individuals have different stakes in the conflict. Individuals closer to the border have (relatively) low stakes as moving the capital to C_B in case of a defeat would be less costly for them. People closer to C_A, have higher

[14]A similar behavioral assumption is made, for instance, in Aghion et al., (2014), who also study effort in conflict, and in Feddersen and Sandroni (2006) and Coate and Conlin (2004), who investigate turnout in elections.

net benefits. For all citizens $i < C_A$ the net benefit is further increasing (respectively. decreasing) in i depending if $g_A > g_B$ (respectively. $g_A < g_B$). Figure 2 draws the net benefit of winning for all citizens in the country for a given set of policies: we select $\gamma_A = 0$, $g_A = g_B$ and we assume that citizen q (at the border of the two countries) is equally distant from the two capitals. An increase of γ_A would shift the net benefit up by the same amount for all citizens, while an increase of g_A would have a stronger positive upward effect on the net benefit of winning of individuals close to the capital. Problem (12) aggregates the net gains of winning of all ordinary citizens in order to determine the common effort which is exerted by all soldiers.

We let NB_A denote the average net benefit of winning in country A

$$NB_A \equiv \int_0^q \frac{U_{i,A}^{+} - U_{i,A}^{-}}{q} di \tag{13}$$

and define the parameter $\Delta \equiv \frac{C_A^2}{q} + \frac{q}{2} - C_A > 0$. Since optimal effort increases in NB_A, policies chosen by the elite raise war effort if they increase the soldiers' net benefit of winning.

Lemma 1: *War effort in A is increasing in g_A and γ_A, and it is decreasing in g_B. In fact,*

$$\begin{gathered}\frac{\partial NB_A}{\partial g_A} = \theta - a\theta(1-\lambda)\Delta > 0 \qquad \frac{\partial NB_A}{\partial \gamma_A} = \frac{t_B(1-q)}{\chi q} > 0 \\ \frac{\partial NB_A}{\partial g_B} = -\theta + a\theta\left(C_B - \lambda C_A - (1-\lambda)\frac{q}{2}\right) < 0\end{gathered} \tag{14}$$

War effort does not depend on t_A, is increasing in t_B and increases in λ if and only if

$$\frac{\partial NB_A}{\partial \lambda} = \theta g_A a \Delta + \theta g_B a\left(\frac{q}{2} - C_A\right) > 0 \tag{15}$$

From (14) a larger government in country A has a positive effect on effort. When the country is relatively homogenous (small a) a given increase of government in A has a stronger effect on citizens' welfare and, consequently, a larger effect on war effort. The promise of a higher share of the spoils of war raises soldiers' effort, especially when χ is small. If B has larger government, effort in A decreases because citizens are less worried by the perspective of moving the capital to C_B; when the capital of country B is more distant, the disincentive effect of higher foreign public good is smaller. Because taxes t_A are paid regardless of the war outcome, the net benefit of winning (hence, war effort) does not depend on t_A. Conversely, an opponent with higher fiscal capacity t_B provides larger spoils of war and raises war effort of soldiers of country A.

The sign of the effect of λ on war effort is ambiguous as the first term of (15) is positive but the second term might be negative. To see why indoctrination might reduce the incentives to fight, notice that nation-building has the biggest effect on the desired effort of the citizens between C_A and the border with country B. Due to indoctrination they would get higher utility from g_A and smaller utility from g_B. As a result, bringing them closer in spirit to their original capital is especially valuable. On the other hand, for citizens who are to the left of C_A a higher λ reduces the "distance" to C_A but also to C_B, increasing the utilities of both victory and defeat. In some cases, for these individuals indoctrination decreases their net benefit of winning. Obviously this effect would be eliminated if there were a fixed cost of losing sovereignty. We return to these issues below.

Finally, from (15) notice that the cross partial derivative of NB_A with respect to spending and indoctrination is $\theta a \Delta > 0$. There is a complementarity: a larger government in A makes indoctrination policy more effective.

4. Public Good Provision versus Loots

In what follows we show that wars, and especially mass warfare, induce the elite to allocate a larger share of tax revenue to public good provision and lead to a reduction of rent extraction. In order to build intuition, we begin to solve a simplified version of the model with no indoctrination ($\lambda = 0$). Using the government budget constraint, the policy vector reduces to (γ_A, g_A). The optimal policy vector maximizing the elite's expected payoff is given by:

$$(\gamma_A^\star, g_A^\star) = \arg\max_{g_A,\gamma_A} (U_{e,A}^+ - U_{e,A}^-)\left(\frac{\chi q e_A}{\chi q e_A + \chi(1-q)e_B}\right) + U_{e,A}^- - e_A \tag{16}$$

The last term of (16) is the linear cost of effort; the underlying assumption is that the elite internalizes the effort cost exerted by ordinary citizens in the war.[15] Note that policies have a direct effect on the elite's payoff and an indirect effect via soldiers' effort. When country

[15]This assumption is completely inessential. If the elite totally disregarded soldiers' effort, the results would be qualitatively unchanged.

A faces an external threat the elite must make some concession. In fact if both g_A and γ_A were equal to zero, soldiers' net benefit of winning would be negative, there would be no war effort, leading to a sure defeat. In choosing g_A and γ_A the elite compares the costs (in terms of its utility) with the benefits (in terms of providing incentives) of both instruments. When equilibrium policies do not hit their upper constraint (i.e., $\gamma_A^\star < 1$ and $g_A^\star < t_A q$), only the most efficient instrument is used. That is, under some conditions, the elite gives citizens incentives to fight by providing public goods but no monetary transfers (that is, soldiers are not paid). Under some other conditions it provides incentives by paying its soldiers, but without delivering public goods.

Proposition 2: *Suppose that equilibrium policies are bounded away from their maximal levels –i.e., $\gamma_A^\star < 1$ and $g_A^\star < t_A q$. When army size is small so that $\chi < \overline{\chi}$, where*

$$\overline{\chi} \equiv \frac{1 - \theta s_A}{q\theta(1 - a\Delta)}, \tag{17}$$

we have $\gamma_A^\star > 0$ and $g_A^\star = 0$. When instead $\chi \geq \overline{\chi}$, we have $g_A^\star > 0$ and $\gamma_A^\star = 0$.

In Appendix we deal with the case in which the policies can also reach their maximal level. Proposition 2 states that there is a cutoff in army size describing when the elite of a country resorts to either public goods or to monetary payoffs. This proposition captures the evolution of wars and nation-building. When armies were small, the elite motivated professional soldiers (mercenaries) by paying them with loots of war. With the advent of mass armies, the loots of wars were not sufficient, or to put it differently the elites had to give up too much of the loots of war to create incentives for the soldiers. The elites started to provide public goods, and soldiers, who were recruited mainly by conscription, fought in order to keep their own sovereignty and public goods.

Figures 3 and 4 show the equilibrium levels of γ_A and g_A as a function of χ. As army size increases, the elite must concede to soldiers a growing share of spoils of war. This is why in Figure 3, γ_A initially increases in χ. When the military participation ratio reaches the threshold $\overline{\chi}$, spending jumps up and soldiers are not paid anymore.[16] Note that this discontinuity arises because we assume linearity of individuals' utility. In the Appendix we solve

[16]Since χ cannot be larger than one, if $\overline{\chi} > 1$ the transition to public good provision never takes place.

a model with quasi-linear utility in consumption and show that results are qualitatively the same, i.e., public spending increases continuously in army-size and loots are not distributed for large values of χ.

Figure 3

Spoils promised to soldiers

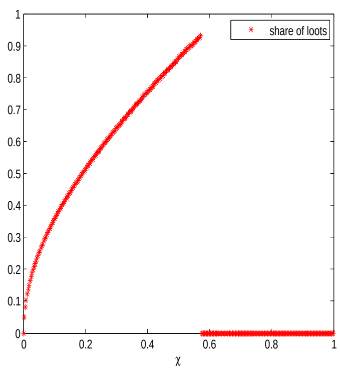
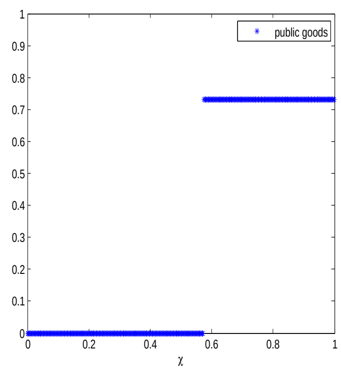


Figure 4

Public goods



From (17), note that the value of $\overline{\chi}$ depends only on parameters of country A. The cutoff $\overline{\chi}$ is decreasing in θ and increasing in societal heterogeneity. A more homogeneous country (lower a) switches "earlier" (i.e. has a lower threshold on army size) to public good provision since the latter are more valued on average in a more homogeneous country. On the contrary, a more heterogeneous society may require more direct payments to soldiers since the latter disagree and do not value much (on average) the benefits of public goods.[17] Moreover, $\overline{\chi}$ is decreasing in s_A and, since Δ is convex and minimized when the capital is in the middle of the country, $\overline{\chi}$ is higher when C_A is located at the borders (either at 0 or q). In these cases, in fact, most citizens perceive the public good as less valuable. Finally, the effect of q, is ambiguous. On the one hand, a larger population makes the dilution problem of loots more severe, favoring public good provision. But on the other hand, by affecting Δ, a larger country might make the public good located in the capital less valuable to most citizens.

In Figure 5, we show individual effort (solid line) and total effort (dashed line) as a function of army size. Individual effort, which is computed according to (12), is strictly decreasing in

[17] Consistently with this, Levi (1997, p. 124) argues that countries with class, social, ethnic and religious cleavages mainly relied on professional soldiers and were least able to mobilize their population to support conscription. For instance, in Canada and Britain universal male conscription was strongly opposed, respectively, by the Francophone and Irish population.

χ as long as $\chi < \overline{\chi}$. This is because the share of spoils of war promised to soldiers increases less than army size. Total effort is however increasing in χ, thus capturing the fact that the increase of army size did indeed make wars more disruptive.

Figure 5

Effort

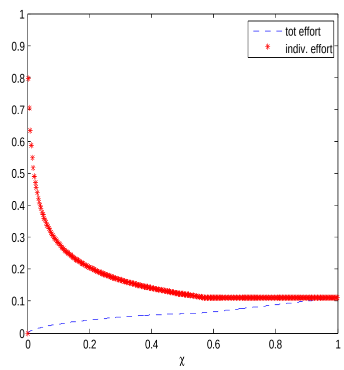
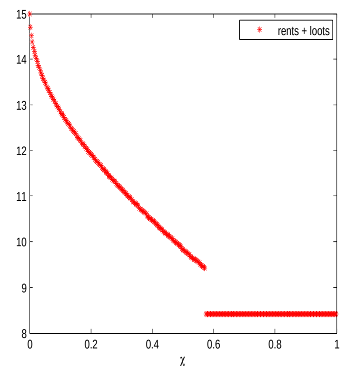


Figure 6

Resources captured by the elite



While public spending jumps up at $\overline{\chi}$, the resources captured by the elite (namely, the sum of rents and loots of war) drop at that cutoff (see Figure 6). In fact at $\overline{\chi}$ the elite is indifferent between distributing loots and providing spending. Since public good spending is valued by the elite, indifference is possible only if monetary transfers to the elite drop. Figure 4 shows that the increase in army size makes the elite worsen off by expanding the concessions to the population.

To determine the levels of g_A and γ_A chosen by the elite we need to solve the first order conditions. To save on space, we only present the one for g_A. We let $NB_{e,A} \equiv U^{+}_{e,A} - U^{-}_{e,A}$ denote the net benefit from winning for the elite which can been obtained from (10) and (11). If the solution for g_A is interior to the interval $[0, t_A q]$ the first order condition is

$$\underbrace{\frac{\frac{\partial P(e_A,e_B)}{\partial g_A}}{P(e_A,e_B)}}_{effort\ effect} \underbrace{(NB_{e,A} - NB_A)}_{disagreement} = \underbrace{\frac{1-\theta s_A}{s_A}}_{elite's\ mc} \tag{18}$$

The right-hand side of (18) is the elite's marginal cost of reducing political rents by providing more public good. The left-hand side has two terms. The first term is large if the winning probability and effort are highly sensitive to increasing public good provision. The second term measures the difference between the net benefit of winning of the elite and the average one in the country. This term captures the extent of disagreement between the two groups regarding the right amount of effort that should be exerted. When the elite has much bigger stakes in the conflict, disagreement is high, increasing the elite's incentives to deliver more public goods in order to raise war effort.

From (18) it is possible to show that if the other country has a bigger government, the elite increases spending in A to "match" the foreign level of spending. That is, there is a sort of "spending contagion" across countries.

Proposition 3: *Suppose* $C_A \leq \frac{q}{2}$. *When* $\chi \geq \overline{\chi}$, *public spending in A increases in* g_B.

Finally, it is interesting to study the effect of preference heterogeneity on public good provision. As discussed earlier, homogenous countries switch "earlier" to public good provision than heterogenous countries. However, if we compare two countries that both have $\chi > \overline{\chi}$, from the first order condition (18) it is ambiguous whether the more homogenous country will choose to provide higher spending levels. On the one hand, a lower a raises the first term of the left-hand side of (18) and makes public spending a more effective instrument to raise effort, pushing g_A up. On the other hand, when a is low, disagreement between the elite and citizens generally decreases (as the elite and most citizens equally enjoy the national public good), weakening the incentives of the elite to boost effort levels chosen by the soldiers. Because of the latter effect, the elite can therefore provide less spending and afford to keep higher rents.[18]

5. Indoctrination and Public Goods

The elite now selects (g_A, γ_A, λ) to maximize its expected payoff. As before, the elite's rents are determined residually using (4). In order to limit the multiplication of cases we derive these results under the assumption that the capital of country A is in the middle of the country.[19]

Assumption 2: $C_A = q/2$.

[18] In the literature (e.g., Alesina et al, 1999) the effect of homogeneity on public good provision is usually unambiguously positive.

[19] Alesina and Spolaore (1997, 2005) show how in some ways this is a "natural" assumption.

Unlike public good spending, which is also enjoyed by the elite, nation-building policies do not directly affect the elite's payoff. Nation-building is pursued only if it is effective in raising war effort. As we noted above, homogenization has the biggest effect on citizens who are close to the borders of the rival country. On the other hand, citizens who are to the left of C_A are not much affected by indoctrination. In some cases, indoctrination decreases their net benefit of winning because it reduces the "distance" to C_A but also to C_B, increasing the utilities of both victory and defeat. Assumption 2 guarantees that the effect of homogenization is unambiguously positive and does not depend on g_B.

As stated in the following lemma, since public spending and nation-building are complements, they are generally provided jointly.

Lemma 2: *In equilibrium, homogenization and public spending are positively related according to the following function*

$$\lambda = \min\left\{\max\left\{\frac{1-\theta s_A}{h}g_A - \frac{(1-a\Delta)}{\Delta}, 0\right\}, 1\right\} \tag{19}$$

From (19), note that while one can observe public good provision without nation-building, the converse is not possible: if country A does not provide any public good in C_A (or g_A is small enough), it is worthless to reduce the citizens' distance to the capital. This result explains why, despite the high degree of heterogeneity of most pre-modern states, nationalism and nation-building become a key force in politics only in the last two centuries. When soldiers were exclusively motivated by monetary payoffs, preference heterogeneity within the country and the distance of preferences with the opponent country have no impact on effort.

Proposition 4 below shows that nation-building makes the public good a more effective instrument to boost war effort, lowering the size of the army at which the public good starts being provided. As before, we suppose that equilibrium policies do not hit their upper constraint, $\gamma_A^\star < 1$ and $g_A^\star < t_A q$. In the online Appendix, we also solve this case.

Proposition 4: *Suppose that equilibrium policies are bounded away from their maximal levels, that is, $\gamma_A^\star < 1$ and $g_A^\star < t_A q$. When nation-building is feasible, the χ cutoff after which public good is provided decreases. That is, there exists a new cutoff $\widehat{\chi}$, where*

$\widehat{\chi} \leq \overline{\chi}$, such that when $\chi < \widehat{\chi}$, we have $\gamma_A^\star > 0$ and $\lambda^\star = g_A^\star = 0$. When $\chi \geq \widehat{\chi}$ we have $\gamma_A^\star = 0$, $g_A^\star > 0$ and $\lambda^\star$ given by (19).

Conditional on being above the cutoff, the effect of homogenization on spending levels is however ambiguous. On the one hand, since nation-building is costly, the adoption of nation-building policies crowds out public good spending. On the other hand, since indoctrination and public good are complements, spending is more effective in raising soldiers' effort, which pushes spending levels up.

The effect on expected citizens' welfare is also not straightforward. On the one hand, homogenization lowers (respectively. increases) the utility in case of defeat of the citizens located to the right (respectively. left) of the capital. On the other hand, homogenization improves welfare in case of victory for all citizens.

6. Nation-Building and Propaganda

In this section, we consider two different forms of nation-building and compare them to the one that we have described in Section 2.1, which we denote as "benchmark" nation-building.

All three forms of nation-building will have a unitary cost h. First, we consider a form of indoctrination (denoted as "enemy-neutral") which does not affect citizens' utility in case country B wins the war. It only raises the value of the public good provided in A. The utility if A wins is

$$\widetilde{U}_{i,A}^{+} = \theta g_A \left[1 - a(1-\lambda_1)\left|i - C_A\right|\right] + c_{i,A} \tag{20}$$

where $\lambda_1 \in [0,1]$. In case of defeat the utility of A's citizens is unchanged and equal to

$$\widetilde{U}_{i,A}^{-} = \theta g_B \left[1 - a\left|i - C_B\right|\right] + c_{i,A} \tag{21}$$

Language policies might fit well this type of nation-building. In fact, it is reasonable to suppose that making, say, Bretons learn French improves their ability to feel "French" and enjoy the public goods provided in Paris, but should have little or no consequence on the way they would enjoy the German public good in case of a defeat in a Franco German war. When considering the effect of this alternative form of nation-building on war effort, there are two considerations. On the one hand, relative to the benchmark, citizens located to the left of C_A have stronger incentives to fight. In fact, when nation-building is enemy-neutral, it cannot be the case that for these citizens the public good provided by the enemy may actually increase in value. On the other hand, there is a negative effect on the desired war effort of citizens located to the right of C_A because for these citizens it is not the case anymore that nation-building worsens their utility in case of defeat. It can be shown that when Assumption 2 holds, the two effects exactly balance out, thus explaining the following Proposition.

Proposition 5: *Suppose that the elite has access to "enemy-neutral" nation-building and the capital is in the middle of the country. In this case, equilibrium war effort, elite's payoffs and public policies coincide with the ones obtained under the "benchmark" form of nation-building.*

This equivalence result hinges crucially on the assumption that the capital is in the middle. If the capital of country A were close to "zero", the "benchmark" form of nation-building would be more effective because bringing the population "closer" to the capital of A would also bring most of the citizens further away from B's capital. Conversely, if the capital were close to the border with country B, "enemy-neutral" nation-building would be more effective.

Next, we consider a third form of indoctrination (labelled "anti-foreign nationalism") which does not make citizens enjoy more the public good in their own capital, but homogenizes the country by making citizens dislike the public good provided by B.[20] If country A is defeated and the capital moves to C_B, we assume that citizen i's utility is

$$\widehat{U}_{i,A}^{-} = (1-\lambda_2)\theta g_B \left[1 - a\left|i - C_B\right|\right] + c_{i,A} \tag{22}$$

where $\lambda_2 \in [0,1]$. A higher λ_2 lowers the value of the foreign public good. Conversely, if country A wins, preferences towards the public good in A are unchanged:

$$\widehat{U}_{i,A}^{+} = \theta g_A \left[1 - a\left|i - C_A\right|\right] + c_{i,A} \tag{23}$$

In considering this form of nation-building, we assume that the elite itself is not affected by its own propaganda: propaganda against the enemy affects ordinary citizens' utility only.

[20] Tilly (1994) stresses that homogenization benefits from the existence of a well-defined other. For example, he writes that, "anti-German sentiment reinforced the desirability of becoming very French, as anti-French, anti-Polish, or anti-Russian feeling reinforced the desirability of becoming very German". As shown by Voigtländer and Voth (2015), these forms of propaganda have long-lasting effects. Guiso et al (2009) find that countries with a history of wars tend to trust each other less.

This form of indoctrination is totally inefficient from a welfare point of view as it worsens agents' utility in case of defeat and does not improve utility in case of victory. The elite wastes resources to convince the country to distrust the opponent. Many country leaders have resorted to this form of nation-building on several occasions.[21]

Before stating the next proposition, we define the following cutoff

$$\widetilde{\chi} \equiv \frac{h}{q\theta g_B(1 - a(C_B - \frac{q}{2}))} \tag{24}$$

and the parameter

$$\varphi \equiv \frac{1 - a\Delta}{1 - \theta s_A} - \frac{g_B(1 - a(C_B - \frac{q}{2}))}{h}. \tag{25}$$

As before, suppose that equilibrium levels of λ_2, γ_A and g_A are bounded away from their maximal levels – i.e., $\lambda_2^\star < 1$, $\gamma_A^\star < 1$ and $g_A^\star < t_A q$. (See the online Appendix on this point)

Proposition 6: *Suppose that the elite has access to anti-foreign propaganda. When army size is sufficiently small, so that $\chi < \min\{\overline{\chi}, \widetilde{\chi}\}$, the elite gives monetary transfers to its soldiers without providing any public good and without doing anti-foreign propaganda. When instead, army size is sufficiently large so that $\chi \geq \min\{\overline{\chi}, \widetilde{\chi}\}$, the elite stops paying its soldiers and creates incentives for them by using either public good provision (when $\varphi \geq 0$) or anti-foreign propaganda (when $\varphi < 0$), but not both.*

Notice that public good provision and anti-foreign propaganda are substitutes and no longer complements. Therefore, we could observe anti-foreign propaganda (hence, strong nationalistic feelings) without any provision of national public good. This result is consistent with the evidence of several countries with high levels of nationalism and national pride but limited ability to provide public goods and implement good policies.[22] Instead, when nation-building takes the other (more "positive") forms, state-building nationalism and public-good provision are observed together.

---

[21]For example, Kallis (2005, p. 65) argues that in the final years of WW2, when beliefs in National Socialism started to crumble, German propaganda switched from "positive" and self-congratulatory discourses to a more "negative" content, stressing anti-Bolshevism, anti-Semitism, and anti-plutocratic themes. The goal was to bolster war effort by convincing the population that resistance was a lesser evil than losing the war. Similarly, in Padro-i-Miquel (2007) citizens support kleptocratic rulers because they fear of falling under an equally venal ruler who would favor other groups.

[22]On this, see Ahlerup and Hansson (2011).

Assume that the elite can pursue only one of the three forms of nation-building. In the remainder of this section, we study which form of nation-building is preferable from the elite's point of view. Given that all the forms of nation-building analyzed so far have no direct effect on the elite's utility, the elite would simply choose the type of indoctrination that allows to increase the effort of the citizens at minimum cost. In the next proposition, we provide a sufficient condition that guarantees that anti-foreign propaganda dominates other forms of nation-building.

Proposition 7: *When fiscal capacity is sufficiently low so that*

$$t_A < \frac{g_B(\frac{1}{a} - (C_B - \frac{q}{2}))}{\Delta q}, \tag{26}$$

the elite's preferred form of nation-building is of the "negative" type.

Proposition 7 states that countries with low fiscal capacity which face an enemy with high levels of public goods will prefer to pursue (if at all) negative propaganda. This result is intuitive: countries which cannot match the level of public goods in the foreign country are discouraged from providing public good. These countries prefer negative propaganda over other (more "positive") forms of nation-building because the former does not require public good provision in the home country to be effective. An implication of Proposition 7 is that in countries with a low level of heterogeneity (low a), citizens already have preferences closer to the national public good so that the marginal benefit of further homogenization is quite small. Therefore, homogenous countries will be more likely to satisfy sufficient condition (26) and implement negative propaganda. This seems intuitive: a very homogenous country emphasizes the superiority of its (homogeneous) "culture", ethnicity or identity over everybody else.

7. Endogenous Taxation

The intuition of what endogenous taxes (or fiscal capacity) would do in our model is quite straightforward although a formal treatment is potentially involved. Let us first consider the case of no external threat. In this case the elite would raise taxes with the only goal of extracting rents. The choice of fiscal capacity would be shaped by the trade-off between the benefits of extracting higher rents and the cost of raising fiscal capacity. When facing an external threat the elite has reasons to collect more taxes (building fiscal capacity) but also to collect lower taxes. Let us begin with the first. The most obvious one is that the elites need tax revenue to buy guns and military equipment. In our model one could add another public good, military spending: a larger amount (holding constant the other country's behavior) would increase the probability of winning. In a more general model, if the enemy responds to military spending of the "home" country with more spending, the two opponents will enter in a "spending" race. Similarly, in order to motivate the soldiers the elite has the incentive to raise taxes to spend more on the "peaceful" public good and on homogenization. On the other hand, there are also reasons to invest less in fiscal capacity when facing an external threat. First, as pointed out by Gennaioli and Voth (2015), war discourages investment in fiscal capacity because with some probability the additional fiscal revenues will be grabbed by the opponent country. Moreover, more taxes might lower soldiers' utility and thus their effort; the latter effect would of course depend on the tax rates in the home country relative to the tax rates in the foreign country. Finally, a larger government would increase the incentive for the enemy to conquer, increasing the enemy's effort and thus lowering the probability of victory of the "home" country. A set of first order conditions would equalize all these margins and it is likely that the former forces give us a solution in which external threats lead to an increase in tax revenues as argued in the literature.[23] In other words when wars become more expensive the need for guns may predominate all the other effects and require higher taxes than in peacetime. Nevertheless, and this is where the contribution of our paper lies, in addition to raising state capacity to buy military equipment, the elites also face the question of how to allocate state revenues. To close where we started, one needs a motivated population not only guns to win wars.

8. Conclusions

In this paper we have explored several issues related to the question of how "wars make states". The literature on this point has mostly focused on how wars induce states to raise their fiscal capacity to buy military equipment. Instead, this paper focuses on other (complementary) issues, namely how to motivate the population (soldiers in particular) to endure war. Besides promising monetary payoffs, the elites have two means to increase war effort.

[23] As Gennaioli and Voth (2014) have shown, this occurs if the sensitivity of war's outcome to fiscal revenues is high.

One is to provide public goods and services in the home country so that soldiers would lose a lot if the war is lost. This would lead to investment in "peaceful" public goods and contribute to state building from a different angle relative to the need to collect taxes to buy guns. Second, the elite may need to homogenize or indoctrinate the citizens to make them appreciate victory and dislike living under foreign occupation. We have explored a variety of ways in which this can be done and depending on the situation a different type of nation-building (leading to anti-foreign nationalism) might be chosen. A key implication of our analysis is that as warfare technologies led to a military revolution with larger armies, the elite had to change the way it motivated the soldiers: from the loots of wars for relatively small armies of mercenaries to public goods and nation building and/or nationalism for large conscripted armies.

References

- Acemoglu Daron and James Robinson (2000) "Why Did the West Extend the Franchise? Democracy, Inequality, and Growth in Historical Perspective" The *Quarterly Journal of Economics*, 2000, vol. 115, issue 4, pages 1167-1199

- Aghion, Philippe, Xavier Jaravel, Torsten Persson, and Dorothee Rouzet (2014). "Education and Military Rivalry" mimeo Harvard.

- Ahlerup Pelle and Gustav Hansson (2011) "Nationalism and government effectiveness" *Journal of Comparative Economics*, 39: 431-451.

- Aidt, Toke, Jayasri Dutta, and Elena Loukoianova (2006). "Democracy comes to Europe: franchise extension and fiscal outcomes 1830–1938." *European Economic Review*, 50(2): 249-283.

- Alesina, Alberto and Enrico Spolaore (2005). "War, peace, and the size of countries." *Journal of Public Economics*, 89(7): 1333-1354.

- Alesina Alberto and Enrico Spolaore (2003) *The Size of Nations*, MIT Press, 2003.

- Alesina, Alberto, and Enrico Spolaore (1997). "On the Number and Size of Nations" *Quarterly Journal of Economics*, vol. 90(5), pages 1276-1296, November 1997

- Alesina, Alberto, Paola Giuliano and Bryony Reich (2017) "Nation-Building" mimeo Harvard University

- Alesina, Alberto, Reza Baqir and William Easterly, (1999) "Public Goods and Ethnic Divisions" *The Quarterly Journal of Economics,* 1243-1284.

- Bandiera Oriana, Myra Mohnen, Imran Rasul, Martina Viarengo (2017) "Nation-Building Through Compulsory Schooling During the Age of Mass Migration" mimeo LSE

- Besley, Timothy, and Torsten Persson (2009). "The origins of state capacity: Property rights, taxation, and politics." *The American Economic Review*, 99(4): 1218-1244.

- Besley, Timothy, and Torsten Persson (2011). *Pillars of Prosperity: The Political Economics of Development Clusters.* Princeton University Press.

- Brewer, John (1990). *The sinews of power: War, money, and the English state, 1688-1783.* Harvard University Press.

- Clausewitz, Carl (1832) *Vom Kriege*, Berlin.

- Coate, Stephen, and Michael Conlin (2004). "A group rule–utilitarian approach to voter turnout: theory and evidence." *The American Economic Review*, 94(5): 1476-1504.

- Crépin, Annie (2009) *Histoire de la Conscription*, Gallimard, Paris.

- Crépin, Annie, and Philippe Boulanger (2001). *Le soldat-citoyen: une histoire de la conscription: le dossier.* La documentation française. 328(1): 258-259

- Darden Keith and Harris Mylonas (2015) "Threats to Territorial Integrity, National Mass Schooling, and Linguistic Commonality" *Comparative Political Studies* 1-34

- Esteban, Joan, and Debraj Ray (2001). "Collective Action and the Group Size Paradox." *American Political Science Review*, 95(3), 663-672.

- Esteban, Joan, and Debraj Ray (2011). "Linking conflict to inequality and polarization." *The American Economic Review*, 101(4): 1345-1374.

- Esteban Joan, Massimo Morelli, and Dominic Rohner (2015) Strategic Mass Killings *Journal of Political Economy*, 123:5, 1087-1132

- Feddersen, Tim, and Alvaro Sandroni (2006). "A theory of participation in elections." *The American Economic Review*, 96(4): 1271-1282.

- Finer, Samuel Edward, (1975). "State and nation-building in Europe: the role of the military." *The Formation of National States in Western Europe*, Ed. Charles Tilly, Princeton University Press, p. 84-163.

- Gennaioli, Nicola, and Hans-Joachim Voth (2015). "State capacity and military conflict." *The Review of Economic Studies*, 82(4): 1409-1448.

- Guiso Luigi Paola Sapienza Luigi Zingales (2009) "Cultural Biases in Economic Exchange?" *Quarterly Journal of Econmics*: 124 (3): 1095-1131

- Harsanyi, John C, (1980). "Rule Utilitarianism, Rights, Obligations and the Theory of Rational Behavior." *Theory and Decision*, 12(2): 115-133.

- Kallis, Aristotle (2005). *Nazi propaganda and the second world war.* Springer.

- Knox MacGregor and Williamson Murray (2001) *The Dynamics of Military Revolution, 1300-2050.* Cambridge University Press

- Levi, Margaret. (1997). *Consent, dissent, and patriotism.* New York: Cambridge University Press.

- Lizzeri, Alessandro and Nicola Persico, (2004) "Why Did the Elite Extend the Suffrage? Democracy and the Scope of Government, with an Application to Britain's Age of Reforms", *The Quarterly Journal of Economics*, 119, 707-765.

- Jackson, Matthew and Massimo Morelli (2007) "Political Bias and War," *American Economic Review*, 97:4, 1353-1373.

- McNeil, William H. (1982). *The Pursuit of Power: Technology, Armed Force, and Society since AD 1000.* University of Chicago Press.

- Mjøset, L., and S. Van Holde (Eds.)(2002). *The comparative study of conscription in the armed forces.* Emerald Group Publishing Limited.

- Onorato, Massimiliano, Kenneth Scheve, and David Stasavage (2014). "Technology and the Era of the Mass Army." *The Journal of Economic History*, 74(02): 449-481.

- Padró i Miquel, Gerard (2007). "The control of politicians in divided societies: the politics of fear." *The Review of Economic Studies*, 74(4): 1259-1274.

- Parker, Geoffrey (1996). *The Military Revolution: Military Innovation and the Rise of the West, 1500-1800.* Cambridge; New York: Cambridge University Press.

- Posen, Barry R. (1993). "Nationalism, the mass army, and military power." *International Security*, 18(2): 80-124.

- Roberts, Michael (1956). *The Military Revolution, 1560-1660: An Inaugural Lecture Delivered Before the Queen's University of Belfast.* Belfast: M. Boyd.

- Rogers Clifford J., ed., (1995). *The Military Revolution Debate. Readings on the Military Transformation of Early Modern Europe.* Westview Press

- Tallett, Frank (1992). *War and Society in Early Modern Europe: 1495-1715.* Routledge.

- Tilly, Charles (1994). "States and nationalism in Europe 1492–1992." *Theory and Society*, 23(1): 131-146.

- Tilly, Charles (1990). *Coercion, capital, and European states, AD 990-1992.* Oxford: Blackwell.

- Voigtländer Nico and Hans-Joachim Voth (2015) "Nazi indoctrination and anti-Semitic beliefs in Germany" *Proceedings of the National Academy of Sciences* vol. 112 no. 26 pp 7931-7936.

- Weber, Eugen (1976). *Peasants into Frenchmen: The Modernization of Rural France, 1870-1914.* Stanford University Press.

Appendix

Proof of Proposition 1: The elite chooses $\lambda = 0$ because the elite does not gain from homogenizing the country. Then, plugging $\lambda = 0$ into (4), the government budget constraint becomes $\pi_A t_A q = g_A$. This allows us to write the elite's problem as

$$\max_{\pi_A} \theta \pi_A t_A q + y_A + (1 - \pi_A)\frac{t_A q}{s_A} \tag{A.1}$$

This expression is linear in π_A and is increasing when $\theta > \frac{1}{s_A}$. Then, public good provision is maximal when $1 - s_A\theta \leq 0$ and zero otherwise. □

Proof of Lemma 1: We proceed by steps.

Step 1. We show that effort is increasing in NB_A.

Optimal effort solves the following problem:

$$\max_{e_A \geq 0} \frac{1}{q}\left(\int_0^q U^-_{i,A} di + P_A(e_A, e_B)\int_0^q (U^+_{i,A} - U^-_{i,A}) di\right) - e_A \tag{A.2}$$

Using (7) and (13) we obtain

$$\max_{e_A} \left(\int_0^q \frac{U^-_{i,A}}{q} di + \frac{q e_A}{q e_A + (1-q) e_B} NB_A\right) - e_A \tag{A.3}$$

If the solution is interior, the first order condition is:

$$NB_A \frac{q[q e_A + (1-q)e_B] - q^2 e_A}{[q e_A + (1-q) e_B]^2} = 1 \tag{A.4}$$

After taking the square root

$$[q(1-q)e_B NB_A]^{1/2} = [q e_A + (1-q) e_B] \tag{A.5}$$

This leads to the optimal effort in country A:

$$e^*_A = max\left\{\frac{[q(1-q)e_B NB_A]^{1/2}}{q} - \frac{(1-q)e_B}{q},\ 0\right\} \tag{A.6}$$

From (A.6) it is immediate that optimal effort is increasing in NB_A. Note that for an interior solution one needs that

$$e_B < \frac{q}{(1-q)} NB_A. \tag{A.7}$$

Step 2. We compute NB_A

First, from (8) we have:

$$\begin{aligned}
&\frac{1}{q}\int_0^q U_{i,A}^{+}di \\
= \; & -\frac{1}{q}\theta g_A a(1-\lambda)[\int_0^{C_A}(C_A-i)di+\int_{C_A}^q(i-C_A)di]+\theta g_A+y_A-t_A+\gamma_A\frac{t_B(1-q)}{\chi q} \\
= \; & -\frac{1}{q}\theta g_A a(1-\lambda)([C_A i-\frac{i^2}{2}]_0^{C_A}+[\frac{i^2}{2}-C_A i]_{C_A}^q)+\theta g_A+y_A-t_A+\gamma_A\frac{t_B(1-q)}{\chi q} \\
= \; & -\frac{1}{q}\theta g_A a(1-\lambda)(C_A^2-\frac{C_A^2}{2}+\frac{q^2}{2}-C_A q-\frac{C_A^2}{2}+C_A^2)+\theta g_A+y_A-t_A+\gamma_A\frac{t_B(1-q)}{\chi q} \\
= \; & -\theta g_A a(1-\lambda)(\frac{C_A^2}{q}+\frac{q}{2}-C_A)+\theta g_A+y_A-t_A+\gamma_A\frac{t_B(1-q)}{\chi q}
\end{aligned}$$

Similarly, from (9)

$$\begin{aligned}
\frac{1}{q}\int_0^q U_{i,A}^{-}di &= -\frac{1}{q}\theta g_B a\int_0^q[(C_B-\lambda C_A)-(1-\lambda)i]di+\frac{1}{q}\left[\theta g_B-t_A+y_A\right]q \\
&= -\frac{1}{q}\theta g_B a[(C_B-\lambda C_A)i-(1-\lambda)\frac{i^2}{2}]_0^q+\theta g_B-t_A+y_A \\
&= -\frac{1}{q}\theta g_B a[(C_B-\lambda C_A)q-(1-\lambda)\frac{q^2}{2}]+\theta g_B-t_A+y_A \\
&= -\theta g_B a[C_B-\lambda C_A-(1-\lambda)\frac{q}{2}]+\theta g_B-t_A+y_A
\end{aligned}$$

Then

$$\begin{aligned}
NB_A &= \frac{1}{q}\int_0^q(U_{i,A}^{+}-U_{i,A}^{-})di \\
&= -\theta g_A a(1-\lambda)(\frac{C_A^2}{q}+\frac{q}{2}-C_A)+\theta g_A+y_A-t_A+\gamma_A\frac{t_B(1-q)}{\chi q} \\
&\quad +\theta g_B a[C_B-\lambda C_A-(1-\lambda)\frac{q}{2}]-\theta g_B+t_A-y_A \\
&= \theta[g_A-g_B-g_A a(1-\lambda)(\frac{C_A^2}{q}+\frac{q}{2}-C_A)] \\
&\quad +\theta g_B a[C_B-\lambda C_A-(1-\lambda)\frac{q}{2}]+\gamma_A\frac{t_B(1-q)}{\chi q} \qquad \text{(A.8)}
\end{aligned}$$

The derivatives in Lemma 1 can be computed from the above expression. Throughout we assume that parameters are such that there exist policies g_A and γ_A for which (A.7) holds. If this were not the case, the analysis would not be interesting because we would either have that the elite (and the citizens) would like to be invaded for all combinations of public policies or that it would be impossible to motivate citizens to exert strictly positive effort. □

Proof of Proposition 2: Define

$$EU_e = NB_{e,A}(\frac{\chi q e_A}{\chi q e_A + \chi(1-q)e_B}) + U^{-}_{e,A} - e_A \tag{A.9}$$

The elite chooses $g_A \in [0, t_A q]$ and $\gamma_A \in [0,1]$ to maximize EU_e. We denote by $\gamma^\star_A$ and $g^\star_A$ the optimal solutions. Using (10) and (11) we compute the net benefit of winning for the elite

$$NB_{e,A} = \theta g_A + (1 - \frac{g_A}{t_A q})\frac{t_A q}{s_A} + \frac{(1-\gamma_A)t_B(1-q)}{s_A} - \theta g_B(1 - a(C_B - C_A)) \tag{A.10}$$

Step 1. We show that it is not optimal to set $\gamma^\star_A = g^\star_A = 0$.

Suppose that parameters are such that it is feasible to choose public policies (i.e., γ_A and g_A) such that (i) NB_A satisfies (A.7) and (ii) and $NB_{e,A} > NB_A$. It is immediate from (A.8) and (A.10) that these requirements are easily satisfied provided that g_B and e_B are not very large, and t_A very low. If it is possible to choose a policy vector that satisfies the two requirements above, that policy vector would be preferable to a policy vector $\gamma_A = g_A = 0$. In that case, in fact, soldiers's effort would be zero, leading to a sure defeat – a suboptimal outcome for the elite. This shows that the elite would never chose $\gamma_A = g_A = 0$: some concessions are made to the population, either in the form of monetary transfers or in the form of public good provision.

The Lagrangian of the problem is

$$\begin{aligned} L(g_A, \gamma_A; \psi, \omega) &= (U^{+}_{e,A} - U^{-}_{e,A})(\frac{\chi q e_A}{\chi q e_A + \chi(1-q)e_B}) + U^{-}_{e,A} - e_A \\ &\quad + \psi g_A + \omega\gamma_A + \widehat{\psi}(t_A q - g_A) + \widehat{\omega}(1-\gamma_A) \end{aligned} \tag{A.11}$$

where ψ, ω, $\widehat{\psi}$, and $\widehat{\omega}$ are the multipliers of the constraints $g_A \geq 0$, $\gamma_A \geq 0$, $g_A \leq t_A q$, and $\gamma_A \leq 1$.

Step 2. We prove that it cannot be that the solution is interior for both public good and transfers. That is, it cannot be $g^\star_A \in (0, t_A q)$ *and* $\gamma^\star_A \in (0,1)$

We take the derivative of (A.11) with respect to γ_A and g_A assuming an interior solution, meaning $\psi = \omega = \widehat{\psi} = \widehat{\omega} = 0$.

$$\frac{[\frac{\partial P(e_A,e_B)}{\partial e_A} NB_{e,A} - 1]}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A}\frac{\partial NB_A}{\partial \gamma_A} = -\frac{\partial NB_{e,A}}{\partial \gamma_A} \tag{A.12}$$

$$\frac{[\frac{\partial P(e_A,e_B)}{\partial e_A} NB_{e,A} - 1]}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A}\frac{\partial NB_A}{\partial g_A} = -\frac{\partial NB_{e,A}}{\partial g_A} \tag{A.13}$$

Assuming an interior condition for effort e_A,

$$\frac{\partial P(e_A, e_B)}{\partial e_A} NB_A = 1 \tag{A.14}$$

we can write

$$\frac{\partial P(e_A, e_B)}{\partial e_A} \frac{NB_{e,A} - NB_A}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A} = \frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}} \tag{A.15}$$

$$\frac{\partial P(e_A, e_B)}{\partial e_A} \frac{NB_{e,A} - NB_A}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A} = \frac{(\frac{1}{s_A} - \theta)}{\theta(1 - a\Delta)} \tag{A.16}$$

Note that the left-hand sides of (A.15) and (A.16) are identical, implying that the right-hand sides must also be identical, which holds non-generically.

Step 3. Suppose $\chi < \frac{1-\theta s_A}{q\theta(1-a\Delta)}$. *If* $\gamma_A^\star \in (0,1)$ *then* $g_A^\star = 0$ *and* $g_A^\star > 0$ *only if* $\gamma_A^\star = 1$. *Suppose instead* $\chi \geq \frac{1-\theta s_A}{q\theta(1-a\Delta)}$. *If* $g_A^\star \in (0, t_A q)$ *then* $\gamma_A^\star = 0$ *and* $\gamma_A^\star > 0$ *only if* $g_A^\star = t_A q$.

Taking the first-order conditions and proceeding as in Step 2,

$$\frac{\partial P(e_A, e_B)}{\partial e_A} \frac{NB_{e,A} - NB_A}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A} \frac{\partial NB_A}{\partial \gamma_A} = -\frac{\partial NB_{e,A}}{\partial \gamma_A} - \frac{\omega}{P(e_A, e_B)} + \frac{\widehat{\omega}}{P(e_A, e_B)} \tag{A.17}$$

$$\frac{\partial P(e_A, e_B)}{\partial e_A} \frac{NB_{e,A} - NB_A}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A} \frac{\partial NB_A}{\partial g_A} = -\frac{\partial NB_{e,A}}{\partial g_A} - \frac{\psi}{P(e_A, e_B)} + \frac{\widehat{\psi}}{P(e_A, e_B)} \tag{A.18}$$

Rearranging terms, and scaling the multipliers, we can write

$$\frac{\partial P(e_A, e_B)}{\partial e_A} \frac{NB_{e,A} - NB_A}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A} = \frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}} - \omega' + \widehat{\omega}' \tag{A.19}$$

$$\frac{\partial P(e_A, e_B)}{\partial e_A} \frac{NB_{e,A} - NB_A}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A} = \frac{(\frac{1}{s_A} - \theta)}{\theta(1 - a\Delta)} - \psi' + \widehat{\psi}' \tag{A.20}$$

Suppose $g_A^\star \in (0, t_A q)$. Then, $\psi' = \widehat{\psi}' = 0$ and we have

$$\frac{\partial P(e_A, e_B)}{\partial e_A} \frac{NB_{e,A} - NB_A}{P(e_A, e_B)} \frac{\partial e_A}{\partial NB_A} = \frac{(\frac{1}{s_A} - \theta)}{\theta(1 - a\Delta)} \tag{A.21}$$

If

$$\frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}} \geq \frac{(\frac{1}{s_A} - \theta)}{\theta(1 - a\Delta)} \tag{A.22}$$

or equivalently $\chi > \overline{\chi}$, we have that $\frac{\partial EU_e}{\partial \gamma_A} < 0$ implying that $\omega' > 0$ and $\gamma_A^\star = 0$. If instead $\chi \leq \overline{\chi}$ we have that $\frac{\partial EU_e}{\partial \gamma_A} > 0$ implying that $\gamma_A^\star = 1$. In other terms, when $g_A^\star \in (0, t_A q)$ we either have $\gamma_A^\star = 1$ or $\gamma_A^\star = 0$.

Suppose instead $\gamma_A^\star \in (0,1)$. Following a similar argument as above, we find that if (A.22) holds, $\frac{\partial EU_e}{\partial g_A} > 0$ so that $g_A^\star = t_A q$. If instead $\chi \leq \overline{\chi}$, $\frac{\partial EU_e}{\partial g_A} < 0$ so that $g_A^\star = 0$.

To claim sufficiency, we show that the LHS of (A.20) is strictly decreasing when $\gamma_A = 0$ and that the LHS of (A.19) is decreasing when $g_A = 0$. If this is the case, there exists a single critical point. The first-order conditions with respect to g_A and γ_A are

$$\frac{q(1-q)e_B\left(NB_{e,A} - NB_A\right)}{qe_A(qe_A + (1-q)e_B)}\theta(1-a\Delta)\frac{\sqrt{(1-q)qe_B}}{2q\sqrt{NB_A}} = (\frac{1}{s_A} - \theta) \tag{A.23}$$

$$\frac{q(1-q)e_B\left(NB_{e,A} - NB_A\right)}{qe_A(qe_A + (1-q)e_B)}\frac{t_B(1-q)}{\chi q}\frac{\sqrt{(1-q)qe_B}}{2q\sqrt{NB_A}} = \frac{t_B(1-q)}{s_A} \tag{A.24}$$

where

$$\begin{aligned} NB_{e,A} - NB_A \quad = \quad & \theta g_A + (1 - \frac{g_A}{t_A q})\frac{t_A q}{s_A} + \frac{(1-\gamma_A)t_B(1-q)}{s_A} \\ & -\theta g_B(1 - a(C_B - C_A)) \\ & -\theta g_A(1-a\Delta) + \theta g_B(1 - a(C_B - \frac{q}{2})) - \gamma_A\frac{t_B(1-q)}{\chi q}. \end{aligned} \tag{A.25}$$

It can be shown that the LHS of (A.23) is decreasing in g_A because $e_A$and NB_A are increasing in g_A and $NB_{e,A} - NB_A$ is decreasing in g_A (given Assumption 1). Similarly, the LHS of (A.23) is decreasing in γ_A because $e_A$and NB_A are increasing in γ_A and $NB_{e,A} - NB_A$ is decreasing in γ_A.

Step 4. Suppose that $\gamma_A^\star < 1$ and $g_A^\star < t_A q$. Expected monetary transfers to the elite – i.e., rents and spoils of war – jump down discontinuously at $\overline{\chi}$.

From the previous step, at $\overline{\chi}$ the elite switches the tool to incentivize the soldiers: when $\chi \geq \overline{\chi}$ the elite provides spending while for $\chi < \overline{\chi}$ the elite pays soldiers. Maximized elite's utility is continuous at $\chi = \overline{\chi}$. Similarly, soldiers' optimal effort is continuous at the threshold. If this were not the case, the elite would improve its payoff by not switching policy at the threshold. We denote by $\gamma_A^\star(\overline{\chi})$ the left-hand limit of the optimal share of loots as $\chi \to \overline{\chi}$. Then, at $\chi = \overline{\chi}$, the elite is indifferent between $g_A^\star(\overline{\chi})$ and $\gamma_A^\star(\overline{\chi})$

$$\theta g_A^\star(\overline{\chi}) + y_A + (1 - \frac{1}{g_A^\star(\overline{\chi})})\frac{1}{s_A} = y_A + \frac{t_A q}{s_A} + (1 - \gamma_A^\star(\overline{\chi}))\frac{t_B(1-q)}{s_A}. \tag{A.26}$$

Given that $\theta g_A^\star(\overline{\chi}) > 0$, monetary transfers to the elite – i.e., the sum rents and spoils of war– must drop at $\chi = \overline{\chi}$. That is,

$$(1 - \frac{1}{g_A^\star(\overline{\chi})})\frac{1}{s_A} < \frac{t_A q}{s_A} + (1 - \gamma_A^\star(\overline{\chi}))\frac{t_B(1-q)}{s_A} \tag{A.27}$$

□

Proof of Proposition 3: Expression (18) is the first order condition with respect to g_A, which can be written as

$$\frac{q(1-q)e_B\left(NB_{e,A}-NB_A\right)}{qe_A(qe_A+(1-q)e_B)}\theta(1-a\Delta)\frac{\sqrt{(1-q)qe_B}}{2q\sqrt{NB_A}}=(\frac{1}{s_A}-\theta) \tag{A.28}$$

We can rewrite (A.25) as

$$NB_{e,A}-NB_A=\theta g_B a(C_B-C_A)-a\theta g_B(C_B-\frac{q}{2})+\Omega \tag{A.29}$$

where Ω is a term that does not depend on g_B. When $C_A \leq \frac{q}{2}$ we have that $NB_{e,A}-NB_A$ increases in g_B. By Lemma 1, NB_A and e_A decrease in g_B. Then, we have that the LHS of (A.28) increases in g_B. This proves Proposition 3. Note that $C_A \leq \frac{q}{2}$ is a sufficient condition (not a necessary one). $\square$

Proof of Lemma 2: Equalizing the first order conditions with respect to λ and g_A in the elite's problem, we obtain

$$\frac{\theta(1-(1-\lambda)a\Delta)}{\frac{1}{s_A}-\theta}=\frac{\theta(g_A a\Delta-g_B a(C_B-\frac{q}{2}))}{\frac{h}{s_A}} \tag{A.30}$$

Solving λ as a function of g_A gives us

$$\lambda=\min\left\{\max\left\{\frac{1-\theta s_A}{h}g_A-\frac{(1-a\Delta)}{\Delta},0\right\},1\right\} \tag{A.31}$$

$\square$

Proof of Proposition 4: Suppose that at the optimum g_A and γ_A do not hit their upper bunds. We take the first order conditions with respect to g_A, γ_A and λ

$$\frac{\partial P(e_A,e_B)}{\partial e_A}\frac{NB_{e,A}-NB_A}{P(e_A,e_B)}\frac{\partial e_A}{\partial NB_A}=\frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}} \tag{A.32}$$

$$\frac{\partial P(e_A,e_B)}{\partial e_A}\frac{NB_{e,A}-NB_A}{P(e_A,e_B)}\frac{\partial e_A}{\partial NB_A}=\frac{(\frac{1}{s_A}-\theta)}{\theta(1-a(1-\lambda)\Delta)} \tag{A.33}$$

$$\frac{\partial P(e_A,e_B)}{\partial e_A}\frac{NB_{e,A}-NB_A}{P(e_A,e_B)}\frac{\partial e_A}{\partial NB_A}=\frac{\frac{h}{s_A}}{\theta g_A a\Delta} \tag{A.34}$$

Suppose $g_A^\star \in (0, t_A q)$. Then (A.33) holds. From Lemma 2, the optimal level of homogenization is $\lambda^\star \geq 0$. If

$$\frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}}>\frac{(\frac{1}{s_A}-\theta)}{\theta(1-a(1-\lambda^\star)\Delta)} \tag{A.35}$$

(or equivalently $\chi \geq \widehat{\chi}$), we have that $\partial EU_e/\partial\gamma_A < 0$ implying that (A.32) cannot hold and $\gamma_A^\star = 0$. Note that when nation-building is feasible, we have that the right-hand side of (A.35) decreases, enlarging the set of parameters for which public good is provided. If

$$\frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}} < \frac{(\frac{1}{s_A}-\theta)}{\theta(1-a(1-\lambda^\star)\Delta)} \tag{A.36}$$

or $\chi < \widehat{\chi}$, we would have $g_A^\star = 0$. □

Proof of Proposition 5: Under the benchmark utility, the average net benefit of winning in the country is

$$\begin{aligned} NB_A &= \theta(g_A - g_B - g_A a(1-\lambda)(\frac{C_A^2}{q} + \frac{q}{2} - C_A)) \\ &\quad + \theta g_B a(C_B - \lambda C_A - (1-\lambda)\frac{q}{2}) + \gamma_A \frac{t_B(1-q)}{\chi q} \end{aligned} \tag{A.37}$$

Under "enemy neutral" nation-building the average net benefit of winning in the country is

$$\begin{aligned} \widetilde{NB}_A &= \theta(g_A - g_B - g_A a(1-\lambda_1)(\frac{C_A^2}{q} + \frac{q}{2} - C_A)) \\ &\quad + \theta g_B a(C_B - \frac{q}{2}) + \gamma_A \frac{t_B y_B(1-q)}{\chi q} \end{aligned} \tag{A.38}$$

Both net benefits are identical when $C_A = \frac{q}{2}$. It also follows that if $C_A > q/2$, "enemy neutral" would be preferable for the elite to the "benchmark" one, and vice versa when $C_A < q/2$. When $C_A = \frac{q}{2}$, since the two forms of nation-building affects the elite utility only through the probability of winning, and since the elite's payoffs do not depend on nation-building, we have that economic outcomes under the two forms of nation-building are identical. □

Proof of Proposition 6: We take the derivative with respect to g_A, γ_A and λ_2.

$$\frac{\partial P(e_A, e_B)}{\partial e_A}\frac{NB_{e,A} - NB_A}{P(e_A, e_B)}\frac{\partial e_A}{\partial NB_A} = \frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}} \tag{A.39}$$

$$\frac{\partial P(e_A, e_B)}{\partial e_A}\frac{NB_{e,A} - NB_A}{P(e_A, e_B)}\frac{\partial e_A}{\partial NB_A} = \frac{(\frac{1}{s_A}-\theta)}{\theta(1-a\Delta)} \tag{A.40}$$

$$\frac{\partial P(e_A, e_B)}{\partial e_A}\frac{NB_{e,A} - NB_A}{P(e_A, e_B)}\frac{\partial e_A}{\partial NB_A} = \frac{\frac{h}{s_A}}{\theta g_B(1-a(C_B - \frac{q}{2}))} \tag{A.41}$$

The analysis is simplified because the right-hand sides are constant. Suppose $\gamma_A^\star \in (0,1)$. If

$$\frac{\frac{t_B(1-q)}{s_A}}{\frac{t_B(1-q)}{\chi q}} < \min\left\{\frac{(\frac{1}{s_A}-\theta)}{\theta(1-a\Delta)}, \frac{\frac{h}{s_A}}{\theta g_B(1-a(C_B-\frac{q}{2}))}\right\} \tag{A.42}$$

we have that g_A and λ_2 are equal to zero. Condition (A.42) is equivalent to $\chi < \min\{\overline{\chi}, \widetilde{\chi}\}$. When $\chi \geq \min\{\overline{\chi}, \widetilde{\chi}\}$, the choice between using g_A or λ_2 is driven by the sign of

$$\frac{(\frac{1}{s_A}-\theta)}{\theta(1-a\Delta)} - \frac{\frac{h}{s_A}}{\theta g_B(1-a(C_B-\frac{q}{2}))} \tag{A.43}$$

which gives us the sign of φ. □

Proof of Proposition 7: Since Assumption 2 holds, "enemy-neutral" and benchmark nation-building yield the same outcomes. De facto, the elite must therefore choose between two forms of nation-building: the "negative" (denoted λ_2) and "positive" one (denoted λ). First, note that when $\lambda = \lambda_2 = 0$ the net benefit of winning is the same for both types of nation-building. The net benefit in case of "negative" indoctrination can be written as

$$\widehat{NB}_A = \theta(g_A - g_A a(\frac{C_A^2}{q} + \frac{q}{2} - C_A)) - \theta(1-\lambda_2)g_B(1-a(C_B-\frac{q}{2})) \tag{A.44}$$

The derivative of the average net benefit with respect to λ_2 is

$$\frac{\partial \widehat{NB}_A}{\partial \lambda_2} = \theta g_B(1-a(C_B-\frac{q}{2})) \tag{A.45}$$

From (A.8) the derivative of the net benefit with respect to λ is

$$\frac{\partial NB_A}{\partial \lambda} = \theta g_A a\Delta \tag{A.46}$$

Therefore, if

$$\theta g_A a\Delta < \theta g_B(1-a(C_B-\frac{q}{2})) \tag{A.47}$$

we have that $\widehat{NB}_A \geq NB_A$, implying that "positive" nation-building is not used. Since fiscal capacity puts an upper bound on spending, that is $g_A < qt_A$, we have that if

$$t_A < \frac{\theta g_B(1-a(C_B-\frac{q}{2}))}{q\theta a\Delta} \tag{A.48}$$

nation-building, if it is used, will be of the negative type. □

Binding fiscal-capacity and loots of war

Assume $\lambda = 0$. Suppose that equilibrium policies are not bounded away from their maximal levels –i.e., either $\gamma_A^\star = 1$ or $g_A^\star = t_A q$. Simulations show that public spending might be provided before the cutoff

$\overline{\chi}$. This occurs because $\gamma_A^\star$ hits the upper constraint and the elite might also want to use the less efficient instrument (public good) to boost effort. In fact, note from Figures A.1 and A.2 that when $\chi \leq \overline{\chi}$, spending is strictly positive precisely when $\gamma_A^\star = 1$. Similarly, from Figure A.2 we observe that soldiers' pay is positive when $\chi > \overline{\chi}$. This occurs because the elite is already using public spending, the most efficient instrument, at full capacity. The graphs below show that qualitatively results are similar to what stated in Proposition 2. It bears stressing that the cutoff is the same one derived in Proposition 2.

Figure A.1

public goods

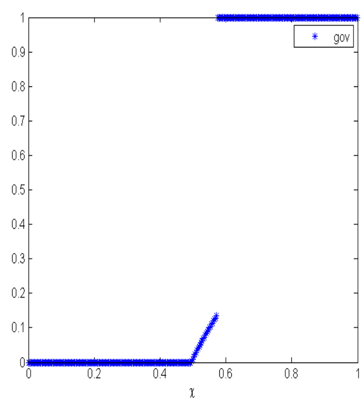


Figure A.2

soldiers' pay

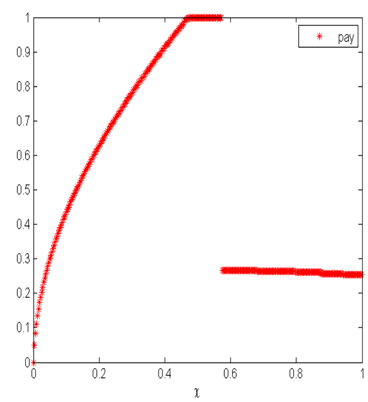
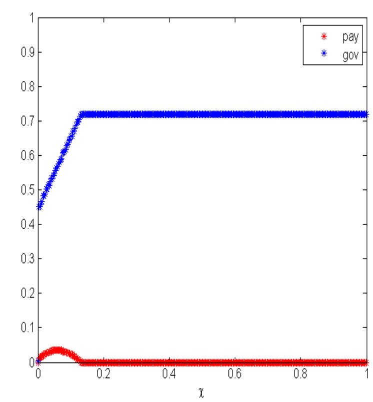


Figure A.3

quasi linear utility



Quasi-Linear Utility

In this Appendix, we solve the model when the marginal utility of public good consumption is not constant. Assume the following quasi-linear utility function for all $i \in [0, q]$

$$U_{i,A} = \ln(g_A)\theta(1 - a\,|i - C_A|) + c_{i,A} \tag{A.49}$$

Under peace, the elite maximizes

$$U_{e,A} = \theta \ln(g_A) + y_A + \frac{(1-\pi_A)t_A q}{s_A}. \tag{A.50}$$

subject to the government's budget constraint. It is immediate to compute that under peace, if the solution is interior (i.e., fiscal capacity is not too low), optimal spending is

$$g_A^\star = \theta s_A \tag{A.51}$$

Compared to Proposition 1, there is public good provision under peace as well and public spending increases in θ and s_A. Under war (assume $\lambda = 0$), if the solutions for $g_A^\star$ and $\gamma_A^\star$ are both interior, we have

$$g_A^\star = \theta s_A + \chi q \theta(1 - a\Delta), \tag{A.52}$$

This implies that an increase in army size raises spending, as in the model in the main text, but in a continuous way. We can simulate a path for spending and soldiers' pay as a function of army size. When army size is small, the solution is interior and public spending increases in χ according to (A.52). As army size gets sufficiently large, soldiers are not paid anymore and public spending is constant thereafter.