Military Conscription, Foreign Policy, and Income Inequality: The Missing Link

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Abstract

This paper seeks to analyze the political economy of military conscription policy and its relationship with a country's foreign policy outlook. National security is modeled as a non-rivalrous and non-excludable public good, whose production technology consists of either centrally conscripted or competitively recruited labor. Conscription is construed as an 'implicit' discretionary tax on citizens' labor endowment. Based on this, I propose a simple political economy model of pure public goods provision financed by two policy instruments: a lump-sum income and a conscription tax. Constraint optimization of a quasi-linear utility function gives rise to three general classes of preferences: high and low-skilled citizens will prefer an all-professional army, albeit of different size, while medium-skilled citizens favor positive levels of conscription. I further tease out the relationship between conscription policy and the level of external threat to a country, its political regime, and its pre-tax inequality levels.

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From the citizen-armies of Ancient Athens and Rome to Napoleonic France and Frederick's Prussia, history is awash with examples of centrally mobilized or else *conscripted* military manpower. In juxtaposition to fiscal taxation, the institution of conscription forms one of the foundational policy bargains of any polity. The obligation to commit one's own private resources (in this case time) towards the common good (see national security) is generally predicated on a constitutive social contract of state-society relations, in the same way one tacitly consents to paying taxes in exchange for centrally-provided public goods. Of course, both the collection of tax revenues and the mobilization of human military resources imply that the state has the Hobbesian coercive power and authority to do so; in other words, state capacity, rather than democratic consent, is the precondition for the public extraction of private resources (Lieberman, 2003; Besley and Persson, 2008). The increased level of centralization and wider 'reach' of the modern nation-state enabling it to mobilize even heftier resources from its citizens or subjects both during times of war and peace make it all the more pertinent to study the terms of these constitutive bargains (Levi, 1996).

In contrast to the enormous and effectively mature literature on both positive and normative aspects of fiscal taxation, the political economy of the so-called 'conscription tax' has not to my knowledge been studied in a systematic and consistent fashion, since the extant body of work and the corresponding policy debates have by and large been motivated by transient historical relevance essentially in the aftermath of major wars. The two World Wars and the Vietnam draft are such cases. Yet, the fact remains that for all their diversity in regime types and security considerations more than half of the world's states employ military conscription in one form or the other (Hadass, 2004), amongst them major powers like China, Russia, and Brazil. Intertemporally (even macrohistorically) the observed variation in state policy with respect to the allocation of military manpower resources by means of either volunteerism (militias), market incentives (mercenaries or professional soldiers), or military conscription (citizen soldiers or mass national armies) is even richer. While in some notable cases, namely Britain, the US, and other Anglo-Saxon democracies after both World Wars (Levi, 1996), the transition back to the *status quo* of full military professionalization was made once the extenuating circumstances of heightened security threat ceased to bind, the long-term trend towards professionalizaton and military downsizing only caught up with countries such as France, Italy, and Spain after the end of the Cold War. The reverse transition towards the adoption of conscription has also happened often in cases beyond the Euro-Atlantic 'security community'.

The main goal of this paper is to provide a parsimonious and pliable theoretical framework that can hone our understanding of both the contemporaneous and intertemporal variation in military conscription policy within a broader range of security settings and polities. In the same way that public economists theorize about the (pro- or anti-) cyclicality of fiscal policy in correspondence to the business cycle, I seek to model the relationship between conscription policy and fluctuations in the security environment, i.e., how the type of military organization is expected to vary across times both of peace and war, for exogenously given political economy fundamentals, such as income inequality and level of democratization. For the purposes of this paper, state capacity is for the most part taken as given (rightly so in cases of countries far along the modernization process), as I assume that any given conscription policy can be costlessly enforced in the medium term by the central authorities of a stable (democratic or non-democratic) polity. Moreover, by thinking of conscription and pecuniary taxation as substitutable policy instruments towards the achievement of a desired level of military preparedness and its corresponding type of foreign policy (hawkish or dovish), one can account for the missing link between changes in the institution of military conscription and long-term foreign policy adjustments to shifting geopolitical circumstances. Again, in parallel fashion to how a country's fiscal policy is a reflection of broader trends and responses to changing macroeconomic conditions, a cogent account of long-term variations in conscription policy should simultaneously endogenize related shifts in foreign policy, captured in effect by changing demand for 'harder' or 'softer' instruments of power and influence.

Building on the seminal work on the redistributive properties of linear tax schedules by Meltzer and Richard (1981), Roberts (1977), and Romer (1975) and the public finance literature on public goods provision, I propose a simple public goods model with lump-sum taxation and conscription as a levy on individual labor endowment, in order to derive induced preferences over conscription policy either for a fixed or malleable foreign policy. In contrast to Poutvaara and Wagener (2007), the model allows for a continuum of mixed-regime combinations of both competitively recruited and centrally drafted military labor (assumed to be perfectly substitutable in the 'security production function'). Following the general equilibrium approach of Harford and Marcus (1988) and Ross (1994), I first derive the market clearing condition for a professional army for any given pair of policy instruments and then solve the ensuing constrained maximization problem, in order to show how induced policy preferences vary with individual income or skill level. While the Spence-Mirrlees condition applies in the medium-term allowing for clear and unqualified predictions on the social choice of conscription policy, it fails to do so once the size of the military becomes endogenized in the long run, which is a way to capture the implicit nexus between military conscription and foreign policy.

The heightened need for military personnel and manpower during the Vietnam War, the controversial nature of the implemented draft, and its eventual elimination in 1973, spawned a growing body of work mainly by economists interested in studying normative questions on the allocative efficiency and equity of conscript versus all-volunteer armies. Focusing on the US military system, papers by Hansen and Weisbrod (1967), Oi (1967), Fisher (1969), and more recently Warner and Asch (1996), analyze the general equilibrium costs and benefits of different military manpower procurement mechanisms, coming out overarchingly in favor of an all-volunteer force (Lee and McKenzie (1992) being a notable exception).

By contrast, this paper adopts a positive political economy approach that places its emphasis on the distributional effects of military conscription (in tandem with foreign policy) for different combinations of substitutable policy instruments. The simplicity of the economic environment and the tax schedule and the assumption of infinite draft evasion costs relegate questions of allocative efficiency to the background. In effect, unidimensional heterogeneity in pre-tax income or skill levels[1] is sufficient to characterize clearly delineated and endogenously formed pro- and anti- conscription constituencies, both in the medium and long run. Whether the size of the army is exogenous or endogenous, it turns out that only middle-class income groups will generally favor positive levels of conscription. The size of the pro-conscription income bracket will depend on the prevailing security environment and the overall *ex ante* income distribution: all else equal, countries under relatively high potential or actual threat and with lower levels of pre-tax inequality will tend to conscript more. On the most part, I choose to focus on preference formation and aggregation only amongst individuals liable for military service. Of course, the preference profile of non-liable individuals should also be taken into account within a positive theory of conscription policy. Furthermore, by differentiating between the medium and the long term and tampering with the issue of liability for drafted service, this static, single-period model can also capture the dynamic considerations of cross-generational incidence and redistribution.[2]

A further contribution of the paper is to generate hypotheses about the relationship between political regime, level of democratization, and military conscription policy. The reverse causal effect with respect to the implications of the mass mobilization of military manpower

[1] Given that labor is the only resource endowment in this simple framework, civilian labor productivity is a perfect predictor of pre-tax civilian income.

[2] Poutvaara and Wagener (2007) provide a more sophisticated account of such questions through an overlapping-generations model of human capital formation and military conscription.

at times of war for the process of democratization and state-formation has been the subject of both historical studies (Andreski, 1968; Tilly, 1975) and a series of political economics papers on political transitions, democratization, and war (Acemoglu and Robinson, 2000, 2001; Lizzeri and Persico, 2004; Glaeser, 2006; Jackson and Morelli, 2007; Besley and Persson, 2008; Ticchi and Vindigni, 2009). Taking the institution of the draft for granted in the lead-up to and during times of war, Ticchi and Vindigni (2009) make the argument that the extension of the franchise by the elites to the masses often served the purpose of a commitment mechanism ensuring the full exertion of effort and patriotic spirit of self-sacrifice on the part of drafted soldiers at times of peril. In the same vein, only countries in the West directly involved in the mass warfare of the 20th century are thought of having achieved their current state of democratic stability and universal suffrage by experiencing the 'growing pains' of war. Yet, the centralized institution of conscription is taken as a transient state of affairs that appears after every 'clarion call to arms'. How this institution is often politically sustained, albeit in a toned down form, during peaceful times is what this paper seeks to answer.

As is widely observed, the army often does not only serve as the bulwark of defense against external enemies. It can be often used against the populace it is supposed to protect either as an agent of a governing elite using repression to stifle internal dissent or by its own volition as part of a military coup (Acemoglu, Ticchi and Vindigni, 2008). Non-democratic regimes are often characterized by inflated needs in military personnel, in order to confront challenges both on the *external* and *internal* fronts. This is thought to change the basic political economy calculus of conscription policy, as the median representative of the regime's selectorate (Bueno de Mesquita et al., 2003) may be more inclined towards the use of conscripted rather than tax-financed military manpower. In a similar fashion as before, there is an endogenously derived parameter interval of democratization levels where partial conscription is favored, giving rise to a Kuznets-like type of relationship between political enfranchisement and conscription policy.[3]

The paper will proceed as follows: I will, first, lay down the basic components of the decision-making environment and then characterize induced individual preferences over medium- and long-term policy outcomes. Based on those results, the ensuing section will look to model the government's choice of conscription and military policy subject to varying degrees of democratic enfranchisement and political legitimacy. Numerical extrapolations of the above results for specific distribution functions are provided throughout to help visualize the mov-

[3]Modeling the relationship between the level of democracy and the conscription regime may help gain a better understanding of the ambiguous empirical results of Mulligan and Shleifer (2005) and Hadass (2004).

ing parts and comparative statics of the model and illustrate the role of income inequality in the above discussion. The final section discusses the model, presents some possible extensions, and concludes. The appendix contains most of the proofs.

2 The Model

2.1 The Policy-Making Environment

The gist of this one-period model consists of the choice over a combination of two substitutable policy instruments towards the production of a pure public good, in this case security. Assume a continuum of citizens of mass one, where each citizen (or subject) i possesses a unit endowment of labor earning a civilian salary $w^i = 1+\eta^i$. Unity represents a sort of minimum civilian wage. The privately known marginal productivity parameter $\eta^i \geq 0$ is distributed according to some commonly known, continuously differentiable distribution function $F(\cdot)$, where $F'(\eta^i) = f(\eta^i) > 0$ for all η^i's in the interior of the support. As is typical of income distribution functions, let $E(\eta^i) \geq F^{-1}\left(\frac{1}{2}\right)$, i.e., the mean is greater or equal to the median. Pre-tax civilian income y^i, therefore, is similarly distributed with a minimum value of one and is strictly increasing in skill.[4] People have preferences over disposable income (or else consumption of some *numeraire* good) and national security, which in this benchmark model can be generated through the single input of military manpower capacity $M \in [0,1]$ according to some 'security production function' $S(M;\phi)$, where $S_M(M;\phi) > 0$ and $S_\phi(M;\phi) \leq 0$ for all M, ϕ and $\phi > 0$. The latter is an exogenous state parameter that proxies for the challenges and opportunities of the external security environment. The higher the level of external threat (ϕ), the lower the level of security (S) holding army size (M) constant. Moreover, army size is constrained by the total unit labor endowment of the economy.

On the same line as the theoretical framework proposed by Morgan and Palmer (2000), I adopt a microeconomic type of approach to modelling the formulation of conscription in tandem with defense policy as decisions to allocate scarce resources (time and income) towards the maximization of security as a collective, all-encompassing end-good. In this stylized economic environment of foreign policy, I assume that only 'hard' (i.e., military) instruments of power and influence are effective, as per the realist conception of the international arena as an anarchic world. In conformity with a typical public goods approach, agents seek to

[4]Note that the set-up of this one-period model does not allow for any form of human capital accumulation or social mobility.

maximize quasi-linear utility[5] in income and security $U^i = y^i + V(S)$, where $V(\cdot)$ is a monotonically increasing and concave function, i.e., $V'(S) > 0$ and $V''(S) < 0$ for all $S \geq 0$.

There are two ways to procure military manpower: either through the universal conscription[6] of a fraction $c \in [0,1]$ of the labor endowment of each civilian liable[7] for military service $\{i|e^i = 1\}$[8] and/or via the direct taxation of income (at a lump-sum level of $t \geq 0$) for the competitive recruitment of a professional force.[9] As individual skills in the civilian sector are assumed not to translate into military productivity,[10] civilians choose for any implemented pair of policy instruments (c, t) whether to join the volunteer force earning a uniform, tax-exempt military salary of $w^m \geq 0$. This non-negativity constraint effectively amounts to a participation constraint in the labor market clearing process, ensuring that liable civilians will not wish to abscond altogether. It further implies that taxes cannot be negative (i.e., subsidies) for the military labor market to clear. Moreover, I assume that the state is a monopsonist of voluntary military labor insofar as it does not have to compete against any type of guerilla group or paramilitary organization for the recruitment of volunteers. Hence, ideological considerations (pro- or anti- establishment) do not factor into the military or civilian employment decision of liable individuals. Finally, the fact that individual civilian productivity η^i is private information and non-transferrable implies a flat military wage rather than a monopsonistic, discriminatory remuneration policy by the state.

The simplified tax structure of the model (tax-exempt military income and a flat income tax)[11] is roughly equivalent to a redistributive income tax schedule, whereby civilians pool

[5] This type of function implies that all income and wealth effects are fully absorbed by private consumption.

[6] The universal nature of conscription subject to objective and easily enforced eligibility criteria is an egalitarian social norm, that in reality is often violated. In this setting, however, perfect monitoring and state capacity render draft evasion costs prohibitively high. An interesting extension of the model would analyze the implications of a legally enacted draft buy-out clause. This was effectively the reason why nobles and upper-class citizens would often not participate in the mass European armies of the 19th and 20th centuries.

[7] Even in a multi-period extension to the model, military conscription obligations need not be considered as one-off but rather as regularly repeated terms of service in each period, as is the case with the US National Guard or the Swiss army. Thus, liability in this case primarily refers to age and health criteria. As this is a static, one-period model, it does matter whether liable civilians have served as conscripts in the past.

[8] Except when told otherwise, we will assume that liability criteria are automatically satisfied, which means that for the most part we will focus on the preferences of civilians liable for military service. This means that the productivity distribution function is implicitly conditioned on liability, i.e., $F(\eta^i) = F(\eta^i|e^i = 1)$.

[9] A similar interpretation is that the government may choose to spend the tax revenue on outsourcing or privatizing its security, as used to be the case with mercenaries and now with private security companies.

[10] In light of the enormous advancement in military technology and the increasing sophistication of weapons, this is a somewhat unrealistic assumption. However, the main insight of the paper carries through even if one assumes a human capital-enhanced military production technology.

[11] The assumption that military income is tax-exempt is not necessary for the main results. Without such an exemption, lower-skilled civilians would still prefer an all-voluntary army $m^* = M$, while the middle and

their pecuniary and labor resources in order to guarantee a certain minimum income level for army volunteers. I do not explicitly account for the distortionary effects and deadweight costs of taxation and conscription. An alternative assumption to that effect would be to assume an upper limit on the feasible income tax rate $\bar{t}$ occurring at the revenue-maximizing peak of the Laffer curve.[12] The perfect substitutability between volunteer and drafted military labor is meant to generate the possibility of mixed regimes of military organization in equilibrium and to capture the substitutability of the income and conscription tax as policy instruments towards the pursuit of foreign policy and security objectives. Yet, what makes the model interesting is that they differ in their distributional effects, since they are targeted towards different groups of people that form endogenously within the general equilibrium of the model.

2.2 General equilibrium of the volunteer army

I now turn to the general equilibrium market clearing process for professional military labor. Initially I make no assumption of a "differential marginal threat effect" between soldiers and civilians, in order to keep things simple.[13] Similarly, the civilian labor market is assumed to be perfectly competitive under full employment. Adding 'friction' to the model by allowing for the possibility of unemployment would certainly enrich its theoretical insights at the expense of parsimony.[14] Essentially, this benchmark specification of the model implicitly assumes that the differential threat effect on military employment and the risk of civilian unemployment balance each other out.

It then follows that civilians will decide to join the volunteer army force whenever tax-exempt military income is at least as high as their post-tax civilian income. Hence, for given combinations of policy instruments (c, t), one can derive the inframarginal productivity type $\widetilde{\eta}$ that clears the labor market by separating the professional soldiers from the civilian

upper-class of civilians would be better off because of a wider allocation of the tax burden. Relaxing the exemption assumption would essentially amount to a direct income transfer from professional military recruits to civilians.

[12] Assuming an upper limit of less than one for the flat income tax $\left(t \in \left[0, \bar{t}\right], \bar{t} < 1\right)$ may also capture limited fiscal capacity because of weak state institutions and a large informal economic sector. See Besley and Persson (forthcoming$a$,f) for endogenous political economy models of state capacity, conflict, and democratization.

[13] The assumption of "differential marginal threat effects" is introduced at a later stage of the model.

[14] Unemployment could be incorporated into the model through a parameter $u \in [0, 1]$ representing the probability of not finding a suitable job in the civilian sector, instead having to rely on unemployment benefits captured by the minimum wage of unity. Then expected disposable income for the civilian population would amount to $\left[(1-u)\left(1+\eta^{i}\right)+u\right](1-c)-t$.

population as follows:

$$w^m = (1+\widetilde{\eta})(1-c) - t \tag{LC}$$

Equation LC is equivalent to a labor supply function for professional military labor that implicitly defines the optimally supplied size of a volunteer force $m = F(\widetilde{\eta})$ for any given military salary w^m. In this sense, the productivity type reflects the opportunity cost of conscripted labor. In a similar fashion, the budget constraint for the recruitment of professional soldiers implicitly defines the national demand function for volunteer military labor through the following budget-balancing rule (military personnel costs have to equal total tax revenues):

$$F(\widetilde{\eta})\, w^m = (1-F(\widetilde{\eta}))\, t \tag{BC}$$

I refer the reader to the appendix for the derivation of the derivatives of the endogenous parameters $(w^m, \widetilde{\eta})$ with respect to the exogenous parameters (c, t) at their market-clearing equilibrium value. Those expressions capture the comparative statics of this non-linear supply and demand system by measuring the extent to which the equilibrium military cutoff type (or else the size of the professional army $m = F(\widetilde{\eta})$) and the military salary will increase or decrease subject to changes in the level of policy instruments (c, t). See figure 1 for an illustration. Note that the cutoff type or else the size of the volunteer force are increasing in both policy instruments. The exact same non-linear system can be uniquely solved in an equivalent fashion with respect to w^m and $m = F(\widetilde{\eta})$, i.e., the actual size of the professional army, as follows:

$$\left\{ \begin{matrix} w^{m*} = \left(1 + F^{-1}(m^*)\right)(1-c) - t \\ m^* w^{m*} = (1-m^*)\, t \end{matrix} \right\}$$

[Figure 1 about here.]

In anticipation of the equilibrium outcome of this subgame, the rest of this section derives income-contingent induced preferences over different regimes of military organization as implied by different combinations of policy instruments. Given that the three policy variables of interest (c, t, M) are subject to different types of 'friction' depending on the analytical time-horizon of the decision-making environment, I first analyze conscription policy preferences and choice in the medium run for a given defense policy M and then proceed to endogenize the choice of army size in the long run. These two perspectives give rise to cross-cutting dynamic constituencies, which highlights the necessity of analyzing the decision-making environment and dynamic horizon of policy-makers in order to gain a better understanding (and empirical identification) of both cross-country and cross-time variation in conscription policy.

2.3 Medium-term preferences over military conscription

What I mean by the medium term is just that time horizon, where the overall geopolitical environment is stable enough that it does not generate any major shifts in foreign and defense policy; hence, the desired size of the military $\overline{M} \in [0,1]$ (or else the public good level of security) is held fixed. At the same time, the horizon is long enough that the transition costs across regimes of military organization, i.e., the balance between conscripted and professional military manpower, are averaged out and dissipated to the degree that policy adjustments to given social preference profiles are assumed to be costless. In the medium run, the process of military professionalization is not necessarily accompanied by downsizing of army forces, given that foreign policy adjustments to real or perceived security challenges and demand for troop deployment remain fixed. How the medium run is translated into actual months or years actually depends on factors such as the volatility of the security environment, bureaucratic state capacity, and military organizational culture. Full professionalization of the French army might not appear such a daunting and time-prolonged task compared to say that of the North Korean army.

Of course, a fixed $\overline{M}$ constrains the set of *feasible* combinations of policy instruments to those that achieve the desired size of armed forces in equilibrium. This constrained set consists of non-negative levels of taxation and conscription $(c,t) \geq \mathbf{0}$ such that

$$F\left(\widetilde{\eta}^{*}\left(c,t\right)\right)+c\left[1-F\left(\widetilde{\eta}^{*}\left(c,t\right)\right)\right]=m^{*}\left(c,t\right)+c\left[1-m^{*}\left(c,t\right)\right]=\overline{M} \qquad \text{(MP)}$$

This is the so-called *military policy* constraint specifying the feasibility frontier of policy instruments necessary to raise an appropriately sized army in accordance with the objectives of a country's foreign and defense policy.

I now have all the necessary parts to derive the most-preferred policy combinations of each citizen for any given skill level $\eta^{i} \geq 0$. I set it up as the following constrained maximization program:

$$\underset{\substack{0\leq c\leq 1\\ t\geq 0}}{Max} U_{MT}^{i}=\max\left\{w^{m*}\left(c,t\right),\left(1+\eta^{i}\right)\left(1-c\right)-t\right\}\ \textit{subject to}\ \left(MP\right),w^{m*}\left(c,t\right)\geq 0$$

The medium-term induced utility function U_{MT}^{i} consists of the private consumption of a numeraire good and an omitted fixed additive security component. As explained above, tax-exempt military wage w^{m*}, which represents the minimum possible disposable income available in society, has to be non-negative. The discontinuity of the maximum function makes it necessary to solve the optimization program for each type of income separately and then to combine solutions by comparing optimized values.

Solving for both necessary first-order and "complementary slackness" conditions of this mixed-constraint optimization problem (shown in the appendix in greater detail), it turns out that the critical levels of taxation and conscription that maximize military volunteer income are such that $c^{mil*} = 0$ and $F\left(\widetilde{\eta}^{mil*}\right) = m^{mil*} = \overline{M}$. This result suggests that military income is always maximized by an all-volunteer army and that positive conscription levels go against the interests of the lower-skilled by suppressing the minimum income guaranteed by enlisting as a volunteer soldier. The optimal value of the multiplier λ^{mil*}, which captures the marginal effect of a change in foreign policy on military disposable income, may either be positive or negative depending on the *inverse hazard* ratio at $\overline{M}$. A large cohort of lower-skilled citizens will oppose positive levels of conscription as unwelcome competition, effectively acting like a trade union restricting market access to non-unionized workers lest they push down industry wages. In fact, organized labor has often expressed its dissent to the draft even at times of extreme danger.[15]

A similar analysis applies to the case of civilian income with the main difference that his optimization subprogram has multiple solutions (besides the trivial case of $c^* = t^* = 0$ for $\overline{M} = 0$) depending on the exact level of productivity η^i. For high enough productivity types, the ideal volunteer army size exceeds the fixed target $\overline{M}$. As in the case of low-income military volunteers, a similar utility-maximizing corner solution of an all-volunteer force carries through. This occurs at a utility-maximizing boundary point of $(c^*, t^*) = \left(0, \overline{M}\left(1 + F^{-1}\left(\overline{M}\right)\right)\right)$ - where the labor market clears at the equilibrium (m^*, w^{m*}) $= \left(\overline{M}, \left(1 + F^{-1}\left(\overline{M}\right)\right)\left(1 - \overline{M}\right)\right)$ -, and it basically requires that the non-negative conscription constraint just binds. Solving the first-order condition with respect to conscription (see equation $FOC_{MT}^{c,civ}$ in the appendix) for μ_2^* and setting $\mu_2^* > 0$ yield the following optimality

[15] On this point see Levi's (1996) discussion of the role of organized labor in the mobilization of military manpower by the main Anglo-Saxon democracies during the Great War.

condition on the type space such that this corner solution exists:

$$\eta^i > F^{-1}\left(\overline{M}\right) + \frac{\overline{M}\left(1-\overline{M}\right)}{f\left(F^{-1}\left(\overline{M}\right)\right)} \equiv H\left(F^{-1}\left(\overline{M}\right)\right) \tag{1}$$

Condition 1 effectively demarcates the boundary of the upper-income type space, characterized by high-skilled individuals who find their time too precious to donate to the common good for some given foreign and defense policy environment.

This time there is also the possibility of an interior solution for medium-ranged values of η^i. Combining the corresponding first-order and "complementary slackness" conditions with respect to c and t leads us to the following optimality condition

$$\eta^i = \widetilde{\eta}^* + \frac{\left(1 - F\left(\widetilde{\eta}^*\right)\right) F\left(\widetilde{\eta}^*\right)}{f\left(\widetilde{\eta}^*\right)} = H\left(\widetilde{\eta}^*\right), \tag{2}$$

where $\widetilde{\eta}^* = \widetilde{\eta}^*\left(c^*, t^*\right)$, $\eta^i \geq \widetilde{\eta}^*$, and $F\left(\widetilde{\eta}^*\right) = m^*$. Equation 2 implicitly defines the individually optimal volunteer cutoff type (or else the optimal size of a volunteer force) with respect to actual civilian productivity.

For the inverse function $H^{-1}\left(\eta^i\right) = \widetilde{\eta}^*$ to exist, the $H(\cdot)$ function has to be *one-to-one* or *injective*; therefore, it would be sufficient to ensure that the function is monotonically increasing. In addition to the continuity assumptions about the distribution function F, the following regularity condition is necessary to guarantee that $H'(\eta) > 0$:

Condition 1 *The distribution function F has to be such that $2F'(\eta)^2 - F''(\eta) F(\eta) > 0, \forall \eta > 0$.*

Each individual maximizes civilian disposable income by setting the optimal cutoff equal to some civilian type of lower productivity, thus retaining his civilian status and balancing the marginal income cost of taxation and conscription. Since $H(0) = 0$ and $H' > 0$, its inverse function H^{-1} will also be monotonically increasing. Then combining MP together with 2 (see appendix for more detail), one can derive the most-preferred levels of conscription and income taxation as follows

$$c^{MI*} = \frac{\overline{M} - F\left(\widetilde{\eta}^*\right)}{1 - F\left(\widetilde{\eta}^*\right)} = \frac{\overline{M} - F\left(H^{-1}\left(\eta^i\right)\right)}{1 - F\left(H^{-1}\left(\eta^i\right)\right)} > 0 \tag{3}$$

$$t^{MI*} = \frac{F\left(\widetilde{\eta}^*\right)\left(1+\widetilde{\eta}^*\right)\left(1-\overline{M}\right)}{1 - F\left(\widetilde{\eta}^*\right)} = \frac{F\left(H^{-1}\left(\eta^i\right)\right)\left(1 + H^{-1}\left(\eta^i\right)\right)\left(1-\overline{M}\right)}{1 - F\left(H^{-1}\left(\eta^i\right)\right)} \geq 0 \tag{4}$$

Within the type space that satisfies the above regularity and optimality conditions, ideal military procurement policy from the perspective of civilians involves positive levels of conscription that are monotonically decreasing with respect to η^i.[16] Optimal taxation is then adjusted appropriately to achieve the target size of armed forces $\overline{M}$.

As the objective function of the initial optimization program is a maximum function, it remains to be determined which productivity types are expected to favor joining the army as volunteers or conscripts. Given that the boundary point that maximizes military income is the same as the one that maximizes the civilian income of high types, it is obvious that highly-skilled individuals with $\eta^i > H\left(F^{-1}\left(\overline{M}\right)\right)$ favor full professionalization so that they can avoid getting drafted. On the other hand, one can endogenously derive the unique threshold type that separates medium-income civilians (MI) favoring drafted service from aspiring professional soldiers. One need only substitute the optimal values of $\left(c^{MI*}, t^{MI*}\right)$ from equations 3 and 4 back into the optimized function and compare civilian disposable income for the middle class with optimal military income under an all-volunteer force. This gives rise to the following inequality constraint

$$\begin{aligned} \Gamma\left(\widetilde{\eta}^*\right) &\equiv \widetilde{\eta}^* + \frac{F\left(\widetilde{\eta}^*\right)}{f\left(\widetilde{\eta}^*\right)} \geq F^{-1}\left(\overline{M}\right) \\ &\Leftrightarrow \eta^i \geq H \circ \Gamma^{-1} \circ F^{-1}\left(\overline{M}\right) \end{aligned} \quad (5)$$

that endogenously defines the lower boundary of the pro-conscription middle-class constituency.[17] The above discussion of the results is summarized in the following proposition:

Proposition 1 *For any continuously differentiable distribution function $F(\cdot)$, such that regularity condition 1 is satisfied and $\overline{M} \in [0,1]$, the unique most preferred medium-term combination of policy instruments $\left(c^*_{MT}, t^*_{MT}\right)$ satisfying constraint MP and the non-negativity constraint $w^{m*}(c,t) \geq 0$ for any given $\eta^i \geq 0$ within the support of the distribution is the*

[16] Note that I choose to drop the i index from the optimal policy values of middle-income individuals (MI) for notational convenience.

[17] Note that again $\Gamma(0) = 0$ and $\Gamma'(\eta) = \frac{2f(\eta)^2 - F(\eta)f'(\eta)}{f(\eta)^2} > 0, \forall \eta > 0$, in light of the above regularity condition 1. Hence, Γ is invertible and its inverse Γ^{-1} is monotonically increasing.

following:

$$
(c^*_{MT}, t^*_{MT}) = \begin{cases} \left(0, \overline{M}\left(1 + F^{-1}\left(\overline{M}\right)\right)\right) & , \forall \eta^i > \left(H \circ F^{-1}\right)\left(\overline{M}\right) \\ \left(\frac{\overline{M} - F\left(H^{-1}\left(\eta^i\right)\right)}{1 - F\left(H^{-1}\left(\eta^i\right)\right)}, \frac{F\left(H^{-1}\left(\eta^i\right)\right)\left(1 + H^{-1}\left(\eta^i\right)\right)\left(1 - \overline{M}\right)}{1 - F\left(H^{-1}\left(\eta^i\right)\right)}\right) & , \forall \eta^i \in \left(\left(H \circ \Gamma^{-1} \circ F^{-1}\right)\left(\overline{M}\right), \left(H \circ F^{-1}\right)\left(\overline{M}\right)\right] \\ \left(0, \overline{M}\left(1 + F^{-1}\left(\overline{M}\right)\right)\right) & , \forall \eta^i \in \left[0, \left(H \circ \Gamma^{-1} \circ F^{-1}\right)\left(\overline{M}\right)\right] \end{cases}
$$

Functions H and Γ^{-1}, as defined by equations 2 and 5 respectively, are monotonically increasing and pass through the origin $(0,0)$.

So for a continuous type space, I have derived the induced medium-term preferences over conscription policy, whereby full military professionalization is *ex ante* (i.e., before the choice of profession) the preferred outcome of both the lower-income (LI) and the higher-income (HI) groups, while there is a medium-income (MI) constituency of civilians liable for military service who favor positive levels of conscription. The higher-income (HI) pro-volunteer-army constituency of support $1 - \left(F \circ H \circ F^{-1}\right)\left(\overline{M}\right)$ consists of those civilians whose productivity is high enough (and so is for them the draft's opportunity cost of foregone civilian income) that they feel that the medium-term level of security threat does not justify any form of conscription. Yet, at an optimum they still end up being hurt the most by any increase in military spending, as shown by the equilibrium size of the Lagrange multiplier in equation 21 in the appendix. At times of precarious and unstable peace (e.g., the Cold War), people in the highest-income brackets should be expected to be the least jingoistic - unless they have actual stakes in the military industry -, as they do not possess the leeway to trade off conscripted labor for direct taxation to smoothen out the effects of a hawkish reorientation in foreign and defense policy ($M \uparrow$). The same conclusion would follow if one assumed a universally applicable progressive tax schedule.

The middle-class 'pocket' of pro-conscription civilians,[18] on the other hand, does prefer a smoother trade-off between conscription and taxation, such that the marginal income loss of increased levels of military manpower procurement is flattened out at the level of the multiplier in equation 23 in the appendix. This is the group of people expected to react in a more predictable, level-headed manner to medium-term adjustments in the country's

[18] Lumping this specific subprofile together should not conceal the fact that it consists of a very heterogeneous compilation of preferences over the ideal type of military organization.

security outlook. They are happy to consent to a policy bargain involving reasonable levels of conscription. Note that the endogenous support of the medium-income pro-conscription constituency $\left(F \circ H \circ F^{-1}\right)\left(\overline{M}\right) - \left(F \circ \left(H \circ \Gamma^{-1}\right) \circ F^{-1}\right)\left(\overline{M}\right)$ is always strictly positive for any $0 < \overline{M} < 1$.[19]

Finally, the class of liable lower-skilled citizens (LI) of size $\left(F \circ \left(H \circ \Gamma^{-1}\right) \circ F^{-1}\right)\left(\overline{M}\right)$ will also favor an all-voluntary force, however for different reasons than the HI class. For a given security environment such that they stand more to gain by volunteering as professional soldiers rather than by plying their trade as civilians, a fully professionalized military organization is the one that maximizes their military wage as determined by the labor market clearing equilibrium. Moreover, as shown by the MP constraint multiplier in equation 20 in the appendix, which is clearly the highest among the three and can be either positive or negative depending on security environment and the shape of the distribution function, the lower-income classes are more susceptible to hawkish instincts and jingoistic rhetoric in the medium run, where adjustments in the labor market can only take place on the margin. This theoretical finding also relates to the fact that far-right nationalist parties tend to draw the bulk of their electoral support from lower-income strata.

The relative size of these distinct and endogenously derived policy constituencies will depend in the medium term on the overall security environment and the corresponding foreign and defense policy adjustments $\left(\overline{M}\right)$ on the one hand and the overall distribution of income on the other. Figure 2 traces out the relative size of the three constituencies HI, MI, and LI for any given level of military size $\overline{M}$ by plotting the cumulative distribution function F of the upper $\left(\widetilde{\eta}_{HI}\left(\overline{M}\right) = \left(H \circ F^{-1}\right)\left(\overline{M}\right)\right)$ and the lower $\left(\widetilde{\eta}_{MI}\left(\overline{M}\right) = \left(H \circ \Gamma^{-1} \circ F^{-1}\right)\left(\overline{M}\right)\right)$ threshold productivity types demarcating the 'boundaries' between the different groups.

I use a functional specification of the model, in order to examine the relationship between the size of the pro-constituency group (MI) and income inequality. This numerical approach confirms the intuition that higher pre-tax income inequality implies less medium-income demand for conscription, since a higher percentage of the population favoring an all-volunteer force is clustered in the low-income (LI) and high-income (HI) tails of the distribution.

[Figure 2 about here.]

To begin with, let $V(\cdot) = \ln(\cdot)$ and $S(M;\phi) = M^{\phi}$. I demonstrate the effect of income in-

[19] For F, F^{-1}, H, and Γ^{-1} all strictly increasing functions for $\overline{M} \in (0,1]$, it suffices to show that $\Gamma^{-1}\left(F^{-1}\left(\overline{M}\right)\right) < F^{-1}\left(\overline{M}\right)$ or else that $F^{-1}\left(\overline{M}\right) < \Gamma\left(F^{-1}\left(\overline{M}\right)\right) = F^{-1}\left(\overline{M}\right) + \frac{\overline{M}}{f\left(F^{-1}\left(\overline{M}\right)\right)}$, which clearly holds.

equality on the profile of conscription preferences by using the Pareto distribution, a power law probability distribution often employed to describe the social allocation of wealth. So let us assume that the social distribution of productivity is parameterized as $\eta^i \sim Pareto\left(\eta_{\min}, \alpha\right)$, where $\eta_{\min} > 0$[20] is the strictly positive minimum possible value of η_i and α is a shape parameter (also known as the *Pareto index*). The cumulative Pareto distribution function in this case is $F\left(\eta^i\right) = 1 - \left(\frac{\eta_{\min}}{\eta^i}\right)^{\alpha}$ for $\eta^i \geq \eta_{\min}$ and zero outside of the support. The mean productivity type is $E\left(\eta^i | \eta_{\min}; \alpha\right) = \frac{\alpha \eta_{\min}}{\alpha - 1}$ and the median is $F^{-1}\left(\frac{1}{2} | \eta_{\min}; \alpha\right) = \eta_{\min} \sqrt[\alpha]{2}$ for $\alpha > 1$. One of the interesting properties of this family of distributions is that the level of inequality as measured by the Gini index is strictly decreasing in the *Pareto index* α, i.e.,

$$G = 1 - 2 \int_0^1 L\left(F\right) dF = \frac{1}{2\alpha - 1},$$

where $L\left(F\right)$ denotes the *Lorenz curve*[21] mapping the proportion of the wealth distribution owned by the bottom F fraction of the values. See figure 3 below for a graphical illustration of Lorenz curves for different values of the *Pareto index* α.

[Figure 3 about here.]

Figures 4 and 5 trace out the relationship between the level of income inequality and the size of the medium-income class, which in this case is the main variable of interest, given that the preferences of the other two classes over military organization essentially coincide (albeit for different reasons). Figure 4 illustrates an inverted-U type of relationship between total military size $\overline{M}$ and the size of the pro-conscription group. This constituency is expected to attain its maximum level of influence and size for medium levels of military mobilization as prescribed by the security environment. Moreover, note that for increasing values of the Pareto index α (decreasing values of inequality) the resulting curve shifts upward, meaning that all else equal the aggregate demand for positive levels of conscription is higher in more egalitarian societies regardless of the security environment in hand. This is shown more clearly in figure 5. The intuition is quite simple: starting from the result that conscription is generally favored by medium-income individuals, then a lower level of inequality implies a stronger middle class and by consequence a higher aggregate demand for conscription. Even

[20] Note that the exact value of $\eta_{\min}$ does not affect the results, since the model is scale-invariant.

[21] The Lorenz curve can be formally written as $L\left(F\left(\eta^i\right)\right) = \frac{\int_{\eta_{\min}}^{\eta^i} tf(t)dt}{\int_{\eta_{\min}}^{\infty} tf(t)dt}$.

though this numerical extrapolation does not constitute a formal proof of my claim, it does confirm the paper's main intuition and provide a clear picture of the expected relationship between income inequality and conscription policy.

Claim 1 *All else equal, aggregate demand for positive levels of conscription is higher in more egalitarian societies.*

[Figure 4 about here.]
[Figure 5 about here.]

2.4 Conscription policy and social choice

The properties of the above medium-term preference profiles as derived by the constrained maximization program allow us to make deterministic predictions about the social aggregation outcome, or else the *core* of the constrained policy set. The discontinuity of the maximum income objective function does not jeopardize the existence of a core for any *augmented* median aggregation rule (see Austen-Smith and Banks, 2005). To prove that the *core* is generically non-empty and unique conditional on the voting rule, it suffices to establish that the single-crossing property applies. First, I proceed to show that post-tax civilian income $y^i\left(c,t|\eta^i>\widetilde{\eta}^*\left(\overline{M}\right)\right)$ satisfies the strict Spence-Mirrlees condition for any given foreign policy requirement $\overline{M}$ *if and only if* the slope of the civilians' indifference curve in (c,t) space is increasing in absolute value in productivity type η^i for all $c\in[0,1]$ and $t\geq 0$, i.e.,

$$\left|\sigma\left(c,t|\eta^i>\widetilde{\eta}^*\left(\overline{M}\right)\right)\right|=-\frac{y^i_c\left(c,t|\eta^i>\widetilde{\eta}^*\left(\overline{M}\right)\right)}{\left|y^i_t\left(c,t|\eta^i>\widetilde{\eta}^*\left(\overline{M}\right)\right)\right|}=1+\eta^i$$

It is clearly the case that the absolute marginal rate of substitution between the income and the conscription tax $\left(\left|\sigma\left(c,t;\eta^i\right)\right|\right)$ is strictly increasing in productivity type η^i. In the case of military income, however, the fact that civilian skills are private information and not transferrable across sectors implies that the equilibrium military wage rate w^{m*} is independent of individual skill. From equations 16 and 17 I get that

$$\left|\sigma\left(c,t|\eta^i\leq\widetilde{\eta}^*\left(\overline{M}\right)\right)\right|=-\frac{\frac{dw^m}{dc}|_{eq.}}{\left|\frac{dw^m}{dt}|_{eq.}\right|}=\frac{\left(1+\widetilde{\eta}^*\right)^2 f\left(\widetilde{\eta}^*\right)}{\left|\left(1-F\left(\widetilde{\eta}^*\right)\right)-\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)\right|}$$

So, given that the numerator of the above expression is positive, the indirect utility indifference curves of the LI class of professional soldiers are downward- (upward-) sloping *if and only* *if* the *inverse hazard* ratio $\frac{1-F(\widetilde{\eta}^*)}{f(\widetilde{\eta}^*)}$ of the equilibrium cutoff type $\widetilde{\eta}^* = \left(H \circ \Gamma^{-1} \circ F^{-1}\right)\left(\overline{M}\right)$ is less (greater) than his pre-tax income $1+\widetilde{\eta}^*$. In the case of the Pareto distribution, soldiers' indifference curves are always downward-sloping for any $\alpha > 1$ and $\overline{M} \in [0,1]$.[22]

Let Q denote an ordering of liable individuals over productivity types η^i such that iQj *if and only if* $\left|\sigma^i\left(c,t|\eta^i,\widetilde{\eta}^*\left(\overline{M}\right)\right)\right| \geq \left|\sigma^j\left(c,t|\eta^j,\widetilde{\eta}^*\left(\overline{M}\right)\right)\right|$. Then, by the properties of monotone comparative statics (Milgrom and Shannon, 1994; Gans and Smart, 1996), I can now state the claim that there exists an ordering of productivity types such that the *single-crossing* property applies in the constrained policy set.

Claim 2 *For all $\overline{M} \in [0,1]$ there always exists an ordering Q of individuals i over productivity types η^i such that the induced utility function $U_{MT}^{i*}\left(c,t|\eta^i,\widetilde{\eta}^*\left(\overline{M}\right)\right)$ is single-crossing in $\left(S,\eta^i\right)$, where $S = \{(c,t)\,|c \in [0,1], w^{m*}(c,t) \geq 0,$ and MP is satisfied$\}$ is the constraint policy set.*

In other words, there always exists an *order-restricted* preference profile such that the high-income (HI) and the low-income (LI) groups are pitted together against the medium-income class. For such a profile Q and any two menus of constraint policy instruments $(c,t),(c',t') \in S$, there always exists a threshold type η^r such that $U_{MT}^{i*}\left(c,t|\eta^i,\widetilde{\eta}^*\left(\overline{M}\right)\right) \geq U_{MT}^{i*}\left(c',t'|\eta^i,\widetilde{\eta}^*\left(\overline{M}\right)\right)$ for all $\{i|iQr\}$ and $U_{MT}^{j*}\left(c,t|\eta^j,\widetilde{\eta}^*\left(\overline{M}\right)\right) \leq U_{MT}^{j*}\left(c',t'|\eta^j,\widetilde{\eta}^*\left(\overline{M}\right)\right)$ for all $\{j|rQj\}$. This implies that the core is generically non-empty for any augmented median voting rule. So, for simple majority voting, the Median Voter Theorem applies and the unique Condorcet winner would be the ideal policy combination of the order-restricted median voter $med(Q) = F_Q^{-1}\left(\frac{1}{2}\right)$ (where Q replaces the binary relation $\geq$ in the definition of the distribution function F_Q).

In light of the above numerical analysis, the joint size of the low-income and high-income groups is always greater than a half, so that in any democracy where electoral suffrage is only extended to those liable to serve the military (usually adult males) one would expect the policy of full professionalization to be always implemented in equilibrium. However, it would be unreasonable to assume that political enfranchisement perfectly coincides with military liability. Up to this point, the issue of liability has been pushed aside as the analysis

[22] In effect, the possibility of upward-sloping military indifference curves is rather irregular and refers to the case of highly inelastic volunteer military labor supply, such that equilibrium military wage w^{m*} is increasing in income taxation t (see equation 17). This case will not generally arise but for peculiar and irregular distribution functions $F(\cdot)$.

has only focused on citizens who are liable for military service.[23] Yet, there are also non-liable adults (because of age, gender, health, or other reasons) $\{k|e^k = 0\}$ with voting rights, whose preferences also have to weigh in on the policy bargain of conscription. Even though the incidence of the conscription tax falls only on liable individuals, the pursuit of national security and the overall level of taxation are issues of general politics that affect everyone, albeit differentially.[24]

Given pure income-related considerations, the preferences of non-liable individuals j are basically *lexicographic*: for any two $(c,t), (c',t') \in S$, $(c,t) \succ^k (c',t')$ *if and only if* $t < t'$, where $\succ^k$ is the strict preference relation. As long as they are not liable to be drafted, they would rather free-ride and have those liable fully undertake the burden of military service via conscription rather than pay themselves any taxes to raise a volunteer force.[25] Their ideal military organization consists of a fully conscripted army, i.e., $(c^{k*}, t^{k*}) = (\overline{M}, 0)$ for all $k \in \{k|e^k = 0\}$ and $\overline{M} \in [0,1]$. This means that non-liable individuals would be placed to the right of middle-class civilians in this augmented order-restricted preference profile Q^{aug}, i.e., for all i such that $e^i = 1$ and k such that $e^k = 0$, $iQ^{aug}k$, where Q^{aug} is an ordering defined over the augmented (productivity and liability) type space $[0,\infty) \times \{0,1\}$. So, depending on the ratio of liable to non-liable individuals (as captured for example by a country's age demographics), an application of the Median Voter Theorem on the augmented order-restricted preference profile Q^{aug} may yield a different equilibrium medium-term policy combination, namely a military organization with positive levels of restriction, i.e., $c^{med(Q^{aug})*} \geq c^{med(Q)*} (= 0)$.[26] This discussion allows us to formulate the following empirically relevant hypothesis:

Claim 3 *All else equal, countries with a lower liability ratio ρ are expected to conscript at a*

[23] Again drawing a parallel with fiscal policy, the policy instrument of military liability may be thought in juxtaposition to the non-taxable income threshold.

[24] The issue of liability naturally touches upon questions of intergenerational incidence and redistribution, explicitly modeled by Poutvaara and Wagener (2007). Since this is a one-period, static model, it does not explicitly model the dynamic considerations of individuals who have served their country in the past and are no longer liable.

[25] Admittedly there are other motivations to be taken into account, especially in the case of married women (possibly not even in the active workforce). The latter would be expected to internalize the adverse effects of taxation and conscription on their husband's income, often the only breadwinner in the family. This possibility could be modeled either through an altruism parameter for the induced utility of a liable individual of the same productivity type or through the joint maximization of household income. The essence of the results remains unaltered.

[26] Expanding the type space to consider the issue of liability is effectively equivalent to implementing an augmented-median aggregation rule to the original profile Q.

higher rate in the medium run.[27]

2.5 Long-term conscription and foreign policy preferences

Framing the same analysis within a long-term perspective is the focus of this subsection. I argue that in the long run military procurement policy and foreign and defense policy are interrelated, in the sense that decisions about long-term security planning in terms of defense spending and overall geopolitical orientation need to be made in conjunction with the appropriate choice of military organization and more specifically conscription regime. In the long run, the systemic geopolitical environment is malleable and historically momentous events, such as the end of the Cold War and the 9/11 attacks, have long-term effects upon the foreign policy orientation of countries. Alliances shift and so does the balance of power on a regional or global level,[28] thereby altering the security threats and challenges faced by each country separately (ϕ). Even though with the advent of modern capital-intensive warfare the long-term effects of foreign and defense policy readjustments have often been absorbed by variable defense spending on weapons systems and military technology, there remain some interesting cases of actual increased mobilization or downsizing of military manpower. The unprecedented level of mobilization right before and during the two World Wars are examples *par excellence* of the former, while the decision of China to downsize and modernize its army throughout the 80s and 90s from around six million to slightly more than two is a telling example of the latter. The gradual reduction in size of Russian army forces (in pursuit of higher specialization, mobility, and flexibility in military deployment) following the collapse of the Soviet Union is another case in hand.

In terms of the model, long-term decision-making and planning endogenizes the army size parameter M, so that quasi-linear utility in consumption and security is maximized with respect to both military organization (c, t) and foreign and defense policy (M) subject to given market clearing and endowment constraints. Assuming that the level of foreign threat

[27] To be sure, the liability ratio should not be generally construed as a fixed parameter but instead as a policy instrument per se with the same effect as the level of conscription. A country may decide to expand its army forces not by increasing the length of conscription service but rather by making more people (e.g., women) liable to serve. However, a shift in the liability policy is arguably more politically controversial and harder to implement.

[28] See Wagner (1994) and Powell (1996) for formal accounts of the role of the 'balance of power' in international relations.

(ϕ) is known, one can reformulate the above maximization program in the following manner:

$$\underset{\substack{0\leq M\leq 1\\0\leq c\leq 1\\t\geq 0}}{Max}\, U_{LT}^{i}=y^{i*}\left(c,t;\eta^{i}\right)+V\left(S\left(M;\phi\right)\right)\ \textit{subject to}\ \left(MP\right),w^{m*}\left(c,t\right)\geq 0$$

This is an expanded version of the medium-term constrained maximization problem by the addition of another optimization variable (M) subject to a *resource endowment (population)* constraint $(0 \leq M \leq 1)$. Solving the mixed system of necessary first-order and "complementary slackness" conditions allows us to derive the individually optimal long-term combination of foreign policy and military organization. The following proposition summarizes the results, while the derivation can be found in the appendix.

Proposition 2 *For any continuously differentiable distribution function $F(\cdot)$, such that regularity condition 1 is satisfied, the unique globally optimal long-term combination of military organization (c_{LT}^{*}, t_{LT}^{*}) and foreign and defense policy (M_{LT}^{*}) jointly satisfying constraint MP, the resource constraint $M \in [0,1]$, and the non-negativity constraint $w^{m*}(c,t) \geq 0$ for any given $\eta^{i} \geq 0$ within the support of the distribution is the following:*

$$\left(c_{LT}^{*},t_{LT}^{*},M_{LT}^{*}\right)=\begin{cases}\left(0,M^{HI*}\left(1+F^{-1}\left(M^{HI*}\right)\right),M^{HI*}\right) & ,\forall\eta^{i}>\left(H\circ F^{-1}\right)\left(M^{HI*}\right)\\ \left(\frac{M^{MI*}-F\left(H^{-1}\left(\eta^{i}\right)\right)}{1-F\left(H^{-1}\left(\eta^{i}\right)\right)},\ \frac{F\left(H^{-1}\left(\eta^{i}\right)\right)\left(1+H^{-1}\left(\eta^{i}\right)\right)\left(1-M^{MI*}\right)}{1-F\left(H^{-1}\left(\eta^{i}\right)\right)},M^{MI*}\right) & ,\forall\eta^{i}\in\left(\widehat{\eta}\left(\phi\right),\left(H\circ F^{-1}\right)\left(M^{HI*}\right)\right]\\ \left(0,M^{LI*}\left(1+F^{-1}\left(M^{LI*}\right)\right),M^{LI*}\right) & ,\forall\eta^{i}\in\left[0,\widehat{\eta}\left(\phi\right)\right]\\ \left(0,0,0\right) & ,\forall\eta^{i}\geq 0\ \textit{iff}\ V_{S}S_{M}\left(0;\phi\right)<1\end{cases}$$

The optimal levels of army size M^{g*} for each group $g \in \{HI, MI, LI\}$ are implicitly defined by the following first-order conditions respectively:

$$V_{S}S_{M}\left(M^{HI*};\phi\right)=1+\Gamma\left(F^{-1}\left(M^{HI*}\right)\right) \tag{6}$$

$$V_{S}S_{M}\left(M^{MI*};\phi\right)=1+\Gamma\left(H^{-1}\left(\eta^{i}\right)\right) \tag{7}$$

$$V_{S}S_{M}\left(M^{LI*};\phi\right)=1+F^{-1}\left(M^{LI*}\right)-\frac{1-M^{LI*}}{f\left(F^{-1}\left(M^{LI*}\right)\right)} \tag{8}$$

Finally, civilian type threshold $\widehat{\eta}(\phi)$ *is uniquely defined by the following indifference condition:*

$$(1+\widehat{\eta}(\phi))\left(1-c^{MI*}\right)-t^{MI*}+V\left(S\left(M^{MI*};\phi\right)\right)=w^{m*}\left(c^{LI*},t^{LI*}\right)+V\left(S\left(M^{LI*};\phi\right)\right) \quad (9)$$

Endogenizing variable M obviously complicates the results but does not alter them significantly. First note the addition of a *trivial* solution $(0,0,0)$. This corner solution captures those cases where the marginal benefits of militarization within a given security environment are so low that a country chooses not to have a standing army, relying instead on local militias and external military protection. Costa Rica is a case in hand. A closer inspection of the first-order conditions 6, 7, and 8 that define the most-preferred levels of military force reveals that the upper-income class has the most 'dovish' preferences with respect to spending on military manpower, while the lower-income classes have the relatively most 'hawkish' ones, i.e., $M^{HI*} \leq M^{MI*} \leq M^{LI*}$.[29] On the left-hand side of these equations we have the marginal security benefits of increased military size, while the right-hand side consists of the absolute marginal income loss.[30] It is therefore quite intuitive that lower-income classes typically project more aggressive and 'hawkish' attitudes towards national security and military mobilization, since they end up bearing a lower fraction of the cost in terms of lost income compared to those who are subject to taxation of either form. This finding reflects the redistributive nature of military policy and mirrors the standard result in public economics that people lower on the income scale favor a more expansive and redistributive fiscal policy.

Adding another necessary first-order condition with respect to M has the long-term effect of reshaping the endogenous boundaries between the various conscription policy constituencies in correspondence with the external security environment ϕ. There are two threshold types to consider: the one as before that separates the high-income from the medium-income civilian group $\left(\left(H \circ F^{-1}\right)\left(M^{HI*}\right)\right)$ and the one that distinguishes between the medium-income civilian class and the lower-income class of professional soldiers $(\widehat{\eta}(\phi))$. This is the unique medium-income type that is indifferent (in terms of indirect utility) between a civilian and a military job. All high-income types obviously favor an outcome of a relatively small all-volunteer army force that leaves them in the civilian sector of the economy, i.e., $\widehat{\eta}(\phi) < \left(H \circ F^{-1}\right)\left(M^{HI*}\right)$, in sharp contrast the preferences of the LI military group that

[29]This result also hinges on the single-input nature of the model. Rehashing it into a multiple-factor framework will surely generate more induced variation in preferred levels of military mobilization conditional on the perceived level of homeland security threats.

[30]Note that the right-hand sides are equal to minus the value of medium-term MP-multipliers λ_{MT}^{g*} for each group $g \in \{HI, MI, LI\}$ respectively.

favors a more expanded professional force financed through increased direct taxation. Hence, the cutoff $\widehat{\eta}(\phi)$ that determines civilian or military status, i.e., whether a medium-sized mixed force or a larger professional force is the globally optimal outcome for each individual, separates the non-degenerate MI interval of types from the LI interval (see figure 6).

2.6 Personal and collective security

Up to this point it has been assumed that everyone enjoys the same level of collective security (pure public good provision) irrespective of occupation. Indeed, as in Harford and Marcus (1988), it seems natural to introduce a differential threat effect or risk premium that drives a wedge between the personal safety of soldiers and civilians respectively. In every security environment arm-bearing soldiers run a higher non-pecuniary risk of injury or even death than civilians in proportion to their term of service (volunteer or conscripted) and the external level of security threat. This specification introduces only absolute-level effects to the medium-run version of the model holding the size of the military constant at its optimal level Accounting for differential personal safety in the long run implies an exogenous contractionary shift in the professional military labor supply curve (LC) by the amount of the relative risk premium of an army job. As increasing levels of external threat (ϕ) contract the labor supply of the volunteer force, they raise the absolute cost of mobilizing an army at times of heightened security risks. The main intuition of the medium-run results remains unaltered. In the long run, however, this enriched specification of the model performs in a more intuitive fashion at higher levels of security risk. Introducing a discrepancy in the levels of personal security depending on occupation captures the increasing incentive-compatibility costs of expanding army size in response to a long-term deterioration in a country's security environment.

To capture the "differential threat effect" on the personal safety of soldiers and civilians respectively, I assume that the probability of staying safe after t^i units of time in the military is exponentially distributed. This implies that the personally enjoyed level of security $\left(S^i\right)$ is a function of the overall level of military mobilization (M), the level of external threat (ϕ), and the amount of time served in the military $\left(t^i\right)$. Then personal security is equal to collective security discounted by this personal safety factor (probability) and becomes $S^{mil}(M;\phi,1) = e^{-\phi}S(M;\phi)$ for soldiers $\left(t^{mil}=1\right)$ and $S^{civ}(M;\phi,c) = e^{-c\phi}S(M;\phi)$ for civilians $\left(t^{civ}=c\right)$ respectively. To illustrate the properties of the model more clearly, I adopt a similar functional specification as above where $V(\cdot) = \ln(\cdot)$ and $S(M;\phi) = M^{\phi}$. Hence, $V\left(S^i\left(M;\phi,t^i\right)\right) = \phi \ln M - \phi t^i, i \in \{mil, civ\}$. This has the convenient implication of shifting the supply curve (LC) uniformly to the left by a factor of ϕ, i.e., LC becomes $w^m = (1 + \widetilde{\eta} + \phi)(1 - c) - t$. Using the same optimization approach as before, figures 6, 7, and 8 showcase some of the results of the extended model.[31]

[Figure 6 about here.]

The relationship between the size of the medium-income group and economic inequality follows a similar pattern as before. Using the same numerical approach, aggregate demand for positive levels of conscription, as captured by the percentage of Pareto-distributed types belonging to the medium-income group, is decreasing in the level of pre-tax inequality for all levels of security threat ϕ. Figure 7 demonstrates the monotonic relationship between inequality and the long-term relative size of the medium-income group for all values of ϕ. On the other hand, the simultaneous choice of foreign policy and conscription regime will tend to suppress the size of the pro-conscription constituency in the long run, as people who prefer to be conscripted for a fraction of their time rather than to be recruited as professional soldiers for a fixed total army size may be better off in the long run with a *globally* optimal potent all-volunteer force as compared to a locally optimal medium-sized mixed force (see condition 9).

Figure 8 shows that the size of the pro-conscription constituency is again maximized for moderate levels of external threat (ϕ), since at times of stability medium-income types will lean more towards a downsized and flexible all-volunteer force, while at times of heightened security threat, the middle classes will be cornered into a military career by the Sisyphean fiscal burden of civilian life at times of war.[32] Moreover, by the Envelope Theorem for constrained maximization, the concavity of the security benefit function $V(\cdot)$ guarantees that *ex ante* long-term indirect utility U_{LT}^{i*} is decreasing in ϕ for all productivity types η^i.[33] People are naturally attracted by the utopian idea of universal demilitarization and 'perpetual peace'

[31] The full solution of this extended functional specification of the model is available from the author upon request.

[32] This type of outcome is a direct implication of the stylized single-input formulation of the 'security production function'. In a multiple-input environment, the individual endowment in defense-specific assets (namely, labor, capital, entrepreneurship, or even the absence of moral strictures) will be a more complete predictor of disposable income.

[33] However, once the choice of career (civilian or military) is sunk (*ex post*), it can be the case for a certain range of volunteer military labor supply elasticities that professional soldiers are better off under heightened security hazards. This is so because an increase in ϕ may expand the target army size M to an extent that increased direct taxation raises equilibrium military wages, in order to attract additional volunteer soldiers on the margin. On the other hand, the *ex post* preferences of civilians are always in favor of lower values of ϕ, since they are the ones to incur the costs (via taxation or conscription) of the expansion in military force.

(in the Kantian sense), yet in a Hobbesian anarchic world the unilateral pursuit of national interest necessitates the appropriate foreign and defense policy adjustments to exogenously given security challenges and threats.

[Figure 7 about here.]

[Figure 8 about here.]

The analysis of the choice of military organization in conjunction with foreign and defense policy in the long run raises the dimensionality of the problem. This implies a generically empty core of social aggregation rules in the long term, as the *single-crossing* property will fail to apply. So even when low-income and high-income groups both in favor of full professionalization comprise a majority of the electorate, they will fail to agree on the appropriate military size in response to the long-term security environment. Thus anyone of medium-income civilians could thus take advantage and propose his own ideal majority-preferred combination of military organization and foreign policy. In the absence of any political 'structure' in the model, such preference cycles do not allow for a deterministic prediction of joint policy choice in the long run. Only by imposing an explicit game structure of policy formation (e.g., through probabilistic voting and electoral competition) would it be possible to derive concrete results with respect to the long-term choice of military manpower procurement and foreign policy.

The preference profiles look quite similar as in the medium-term, the main difference lying in the long-term boundaries between the various groups. These dynamically shifting constituencies make for a very interesting policy-making environment, where government policy needs to balance between these two perspectives. Yet, to be able to make concrete analytical predictions and to properly identify empirical variation in conscription policy, one has to impute some assumptions regarding policymakers' perception of the security environment in the medium and long run and their decision-making horizon, where the latter could be captured by such proxies as constitutionally-mandated office terms.

3 Conscription and Democratization

This section studies the choice of conscription and military policy at various stages of democratization and for various types of regimes. In a model of variable enfranchisement (see Jack and Lagunoff (2006) for a related approach), I want to see what happens when liability of service and the right to vote do not perfectly overlap. This study of the relationship between political inequality and conscription policy is analogous to that between economic inequality and redistribution. Taking state capacity for granted, I assume that any policy bargain on the level of conscription is perfectly enforceable by a pervasive government eager to maximize its chances of survival by keeping its core supporters satisfied. Questions of political legitimacy, regime stability, and moral hazard (often emphasized in connection with the extension of the franchise as an incentive-compatibility constraint by the political economics literature on war and democratization) are subsumed through the postulate of a non-negative-income constraint.[34] Since the aim of this paper is to explain the opposite direction of causality by isolating the effect of political regime upon the choice of military organization, I choose to hold constant one of the moving parts of this interesting endogeneity puzzle, namely the sustainability of the regime. For reasons of parsimony and given that the qualitative nature of results is not affected, I revert back to the original model without the distinction between personal and collective security.

Let $\delta \in [0, 1]$ denote the bottom fraction of productivity types that are politically disenfranchised. What this means is that at such a level of democratization the government will seek to maximize the utility of the politically empowered elites. In terms of the 'selectorate' model by Bueno de Mesquita et al. (2003), the fraction $1 - \delta$ would refer to the size of the selectorate, whose potential support is crucial for the regime's political survival. Patronage and cronyism in polities with limited enfranchisement imply that only the preferences of the elite core of supporters are factored into public policy formation. Naturally, income being the only source of heterogeneity, the enfranchised fraction $1-\delta$ of the population will consist of a continuum of types from threshold type $F^{-1}(\delta)$ up to the upper bound of the distribution's support. It is therefore assumed that regimes at a δ-level of democratization will seek to

[34]In other words, I assume that all citizens or subjects regardless of their political rights have no reason to protest government policy or to revolt against the regime itself as long as their disposable income is non-negative.

maximize the following long-term welfare function:

$$\underset{\substack{0\leq M\leq 1\\ 0\leq c\leq 1\\ t\geq 0}}{Max}\, W_{LT}^{\delta} = \int\limits_{F^{-1}(\delta)}^{\infty} U_{LT}^{i} dF\left(\eta^{i}|\eta^{i} \geq F^{-1}(\delta)\right)$$

$$= \int\limits_{\min\{\widetilde{\eta}^{*}(c,t),F^{-1}(\delta)\}}^{\widetilde{\eta}^{*}(c,t)} w^{m*}(c,t)\, dF\left(\eta^{i}|\eta^{i} \geq F^{-1}(\delta)\right)$$

$$+ \int\limits_{\max\{\widetilde{\eta}^{*}(c,t),F^{-1}(\delta)\}}^{\infty} \left[\left(1+\eta^{i}\right)(1-c) - t\right] dF\left(\eta^{i}|\eta^{i} \geq F^{-1}(\delta)\right)$$

$$+ V\left(S\left(M;\phi\right)\right)\ \textit{subject to}\ \ (MP)\ \text{ and } w^{m*}(c,t) \geq 0$$

I choose to adopt the above utilitarian welfare function[35] as a benchmark of Pareto efficiency with respect to the preferences of the enfranchised population. For a population of mass one, this effectively amounts to the ideal conscription and foreign policy combination $\left(c^{\delta*}, t^{\delta*}, M^{\delta*}\right)$ of the mean enfranchised type, which is why the distribution of types has to be conditioned on the level δ of democratization or equivalently the status of political enfranchisement of each type in the population. Note that the maximum and minimum functions of the integration bounds are necessary to capture two distinct possibilities: either the cutoff enfranchised type belongs in the long term to the military low-income class, i.e., $\delta < F\left(\widetilde{\eta}^{*}\right)$, or the civilian class, i.e., $\delta \geq F\left(\widetilde{\eta}^{*}\right)$. The optimization program remains essentially the same as before and, while technical details can be found in the appendix, the following proposition summarizes the solution:

Proposition 3 *For any continuously differentiable distribution function $F(\cdot)$, such that regularity condition 1 is satisfied, and level of enfranchisement $\delta \in [0,1]$, the long-term utilitarian optimum of military organization $\left(c_{LT}^{\delta*}, t_{LT}^{\delta*}\right)$ and foreign and defense policy $\left(M_{LT}^{\delta*}\right)$ jointly satisfying constraint MP, the resource constraint $M \in [0,1]$, and the non-negativity*

[35] This welfare specification is relatively innocuous, as quasi-linear preferences rule out meaningful distributional considerations with respect to wealth allocation.

constraint $w^{m*}(c,t) \geq 0$ *is the following:*

$$\left(c_{LT}^{\delta*}, t_{LT}^{\delta*}, M_{LT}^{\delta*}\right) = \begin{cases} \left(0, M^{HI*}\left(1+F^{-1}\left(M^{HI*}\right)\right), M^{HI*}\right) & \text{, iff } \delta \geq M^{HI*} \text{ and } \\ & \Theta(\delta) > \left(H \circ F^{-1}\right)\left(M^{HI*}\right) \\ \left(\frac{M^{MI*}-F\left(H^{-1}(\Theta(\delta))\right)}{1-(F \circ H^{-1})(\Theta(\delta))}, \right. & \\ \left. \frac{F\left(H^{-1}(\Theta(\delta))\right)\left(1+H^{-1}(\Theta(\delta))\right)\left(1-M^{MI*}\right)}{1-F(H^{-1}(\Theta(\delta)))}, M^{MI*}\right) & \text{, iff } \delta \geq \left(F \circ H^{-1}\right)(\Theta(\delta)) \text{ and } \\ & \Theta(\delta) \leq \left(H \circ F^{-1}\right)\left(M^{HI*}\right) \\ \left(\frac{M^{MI(\delta)*}-F\left(\widetilde{\eta}^{\delta*}\right)}{1-F\left(\widetilde{\eta}^{\delta*}\right)}, \right. & \text{, iff } \delta < F\left(\widetilde{\eta}^{\delta*}\right) \text{ and } \Theta\left(M^{LI(\delta)*}\right) \leq \\ \left. \frac{F\left(\widetilde{\eta}^{\delta*}\right)\left(1+\widetilde{\eta}^{\delta*}\right)\left(1-M^{MI(\delta)*}\right)}{1-F\left(\widetilde{\eta}^{\delta*}\right)}, M^{MI(\delta)*}\right) & F^{-1}\left(M^{LI(\delta)*}\right) + \frac{\delta\left(1-M^{LI(\delta)*}\right)}{f\left(F^{-1}\left(M^{LI(\delta)*}\right)\right)} \\ \left(0, M^{LI(\delta)*}\left(1+F^{-1}\left(M^{LI(\delta)*}\right)\right), M^{LI(\delta)*}\right) & \text{, iff } \delta < M^{LI(\delta)*} \text{ and } \Theta\left(M^{LI(\delta)*}\right) > \\ & F^{-1}\left(M^{LI(\delta)*}\right) + \frac{\delta\left(1-M^{LI(\delta)*}\right)}{f\left(F^{-1}\left(M^{LI(\delta)*}\right)\right)} \\ (0,0,0) & , \forall \delta \in [0,1] \text{ iff } V_S S_M(0;\phi) < 1 \end{cases}$$

Function $\Theta(\delta) = E\left(\eta^i | \eta^i \geq F^{-1}(\delta)\right)$ *denotes expected civilian productivity conditional on political enfranchisement. The welfare-maximizing military cutoff type* $\widetilde{\eta}^{\delta*}$ *for the sequentially enfranchised group* $MI(\delta)$ *is implicitly defined by the following first-order condition:*

$$E\left(\eta^i | \eta^i \geq \widetilde{\eta}^{\delta*}\right) = \widetilde{\eta}^{\delta*} + \frac{\delta\left(1-F\left(\widetilde{\eta}^{\delta*}\right)\right)}{f\left(\widetilde{\eta}^{\delta*}\right)} \tag{10}$$

The optimal levels of army size M^{g*} *for each group* $g \in \{HI, MI, MI(\delta), LI\}$ *are implicitly defined by the following first-order conditions respectively:*

$$V_S S_M\left(M^{HI*};\phi\right) = 1 + \left(\Gamma \circ F^{-1}\right)\left(M^{HI*}\right) \tag{11}$$

$$V_S S_M\left(M^{MI*};\phi\right) = 1 + \left(\Gamma \circ H^{-1}\right)(\Theta(\delta)) \tag{12}$$

$$V_S S_M\left(M^{MI(\delta)*};\phi\right) = 1 + \widetilde{\eta}^{\delta*} + \frac{\delta}{1-\delta}\frac{1-F\left(\widetilde{\eta}^{\delta*}\right)}{f\left(\widetilde{\eta}^{\delta*}\right)} \tag{13}$$

$$V_S S_M \left(M^{LI*};\phi\right) = 1 + F^{-1}\left(M^{LI*}\right) + \frac{\delta}{1-\delta}\frac{1-M^{LI*}}{f\left(F^{-1}\left(M^{LI*}\right)\right)} \tag{14}$$

Even though combining the two possible cases obviously increases the subintervals of the optimal solution, the pattern remains the same. Conscription emerges as a long-term welfare-maximizing type of military organization for medium levels of enfranchisement. For high values of δ (oligarchy), the interests of the ruling elites are best served by an all-volunteer army, relatively small in size $\left(M^{HI*}\right)$. This mirrors the preferences of the high-income group (HI). Within a certain range of medium enfranchisement levels (what people refer to as the 'gray zone' of the democratization process), the utilitarian aggregation of the electorate's preferences entails positive levels of conscription in conjunction with a medium-sized mixed force $\left(M^{MI*}, M^{MI(\delta*)}\right)$. This refers to the case of franchise extension to the middle-class, urban bourgeoisie. The average enfranchised type prefers a civilian career on one hand but is also willing to incur part of the tax burden through conscription. However, the existence of a non-degenerate interval of limited-suffrage levels of democratization is sensible to the type of income distribution[36] and the long-term security environment. Demand for redistribution in the form of conscription is expected to arise during the process of democratization and gradual extension of the franchise only for moderate levels of security risks. The model also predicts that during times of peace or war volunteerism will be the predominant pattern. Finally, the transition to mass democracies through the enfranchisement of the working class (LI) shifts the Samuelsonian optimum back to full military professionalization and increasingly higher military mobilization $\left(M^{LI(\delta)*}\right)$. Above a certain threshold of enfranchisement, the preferences of the lower-income groups tend to dominate.[37] Figure 9 provides a numerical example of the above solution for different levels of enfranchisement δ and η^i uniformly distributed on the unit interval.

[Figure 9 about here.]

This schematic and highly stylized representation of the effect of gradual enfranchisement on military organization aims at highlighting the non-monotonicity of the relationship, which can actually be even more complex than that. For example, depending on the ratio of liable to non-liable enfranchised citizens, the extension of suffrage to non-liable groups of civilians with

[36] Formally, it has to be the case that compound function $\left(F \circ H^{-1}\right)(\Theta(\delta))$ has at least one interior fixed point with respect to $\delta \in (0,1)$.

[37] It should be made clear, however, that these Pareto efficient policy outcomes do not account for either deadweight costs of taxation or the possibility of side transfers.

ambiguous preference profiles (e.g., women) may have reversed the trend back towards mixed military organization forms. All in all, the above pattern does closely mirror the coterminous evolution of conscription policy and franchise extension over long periods of time. From the small and flexible mercenary armies of the pre-industrial and early democratization periods, to the national mass armies of the 19th and early 20th century, and then back to the post-WWII and post-Cold War trend towards military professionalization (and even privatization of security), the macrohistorical picture seems to fit the pattern (Levi, 1998). However, a rigorous empirical analysis looking for this type of long-term trends in the data may run into issues of endogeneity (mentioned above) and serial correlation.

The same theoretical framework can be used to explain cross-sectional variation across political regimes. By construing $1 - \delta$ as the fraction of the enfranchised population (or else the selectorate), this formulation roughly captures the full gamut of polities, from fully enfranchised democracies to dictatorships and personalistic regimes. Yet, there are additional considerations to be taken into account. Throughout this paper the army is assumed to serve the role of national security provider and protector from external threats. That being said, it is often the case that the military plays an important role in the domestic political arena. An appropriate extension of the model would thus have to make allowances for the added benefits of *internal* (as well as *external*) security that come with increased mobilization of military manpower. These types of benefits arise both in democratic and autocratic regimes, albeit under a different guise. The mobilization of the army in the event of a natural catastrophe or even conscripted civil service are types of internal benefits more prevalent in democracies. The role of the army and even paramilitary groups as agents of repression, coercion, and persecution is a more common pattern across non-democratic regimes. If these types of benefits were inversely proportional to the level of democratization, then one would expect military mobilization levels to peak at medium levels of enfranchisement. Of course the story is not as straightforward as that. On one hand, a mass army of conscripts could be easier to control but harder to motivate in the absence of true political legitimacy on the part of the regime. On the other hand, ruling elites often fear the proclivity of professional high-ranking officers for military coups. Therefore, a sound theory of conscription policy under dictatorial rule should seek to derive the type of military organization that maximizes the dictator's chances of political survival.

4 Discussion and Extensions

I have presented a general equilibrium model of the political economy of military conscription in conjunction with the choice of foreign and defense policy. Upon making the distinction between a medium-term and a long-term decision-making environment, I model individual preferences over and social choice of military manpower procurement regimes. Embedded within a simplified framework of taxation and unidimensional income heterogeneity, the analysis highlights the strongly non-monotonic nature of conscription preference profiles with respect to civilian productivity. In contrast to the fundamental result in public finance that economic inequality generates higher demand for redistribution via taxation, this supposition does not hold with regard to the 'conscription tax'. As it becomes evident in both the medium and the long term, it is mostly the middle class that benefits from the draft, whilst the higher and lower income strata favor full military professionalization financed through direct taxation. As such, conscription constitutes a form of redistribution from the extremes to the middle of the income distribution. On the other hand, ideal army size is monotonically decreasing with respect to civilian productivity, as the lower-income group of aspiring army recruits stands most to gain from higher levels of military mobilization. An analogous result is replicated to derive the relationship between the type of military organization that maximizes the aggregate welfare of the enfranchised social groups and the level of democratization. It is shown that this relationship is potentially non-monotonic as the use of the draft becomes optimal in cases of limited suffrage and for moderate values of security risks.

There are a number of caveats that should be factored into the interpretation of the results. First, the emphasis of the model is on the redistributive properties of the conscription tax rather than its allocative efficiency. To that effect and from the perspective of individual choice, I choose to ignore the various efficiency considerations of military manpower procurement, namely the differential training, administrative, and recruitment costs of a drafted and an all-volunteer force respectively, the deadweight costs of taxation, and the enforcement costs of conscription.[38] The postulate of perfect state capacity implies that the costs of draft evasion are prohibitively high, so that draftee turnout is invariably enforced. This explains why the model fails to distinguish between mass conscription and very high levels of volunteerism of citizen-soldiers willing to fight for next to nothing (as military wages approach zero) during critical times of excessively high (existential) threat and war. Instead it treats

[38] See Warner and Negrusa (2005) for a theoretical account of these costs and Mulligan and Shleifer (2005) for an empirical analysis.

them as essentially equivalent outcomes. Since the labor market equilibrium in the model acts as a disciplining mechanism of military mobilization through prohibitively high levels of taxation for those choosing not to fight, there is no need to model military service as a problem of collective action and free-riding. Accordingly, it is at extreme levels of mobilization (M high) that the level of taxation reaches its peak, in order to guarantee that universal volunteering rather than free-riding is the incentive-compatible thing to do. The assumption of differential threat levels to civilians and soldiers and heterogeneous draft evasion costs would be required to establish the rationale of conscription and shaming campaigns as more effective mechanisms of mass mobilization.

Second, the simple tax structure of the model glosses over a much wider range of policy levers when it comes to military conscription. Taking the official term of conscription as the sole focus of analysis can overstate the extant cross-sectional variation in official policy by omitting to account for the possibilities of buy-out, replacement, commutation, and liability expansion as complementary aspects of draft enforcement and military manpower procurement policy (Levi, 1998). A more sophisticated formulation of the model would take these into account and study their differential redistributive consequences and their effect on preferred levels of conscription. Expanding the conscription policy space would give rise to more complicated preference profiles as well as multiple local equilibria. In the same vein, an empirical investigation of cross-country and cross-time variation should weight observations appropriately with respect to the exact conscription law in place, in order to distill the net redistributional effects of conscription policy on various social groups.

Third, national security rests on a single-input technology that provides the link between conscription and foreign policy, namely the projection of military power through army size. On one hand, this assumption masks the effect of vast advances in military technology, strategy, and weapons systems on the productivity of military labor. On the other hand, it provides a very crude proxy for the orientation of a country's foreign and defense policy. This political economy approach focuses on army size *per se* as a policy input without consideration for its deployment in accordance with an offensive or defensive military doctrine.[39] The fact, for example, that South Korea has one of the largest armies in the world does not necessarily imply that it is a revisionist state.

The multiplicity and substitutability of foreign policy instruments (Morgan and Palmer, 2000) would be better captured by an extension of the benchmark model to a two-input secu-

[39] See Choi and James (2003) for an interesting empirical study of military manpower procurement mechanisms in connection with militarized interstate disputes.

rity technology, whereby the objective of national security can be achieved by means of both 'hard' (i.e., military manpower, armament) and 'soft' (i.e., diplomacy, alliance formation, foreign aid) foreign policy instruments.[40] Such a multiple-good extension would generate a more nuanced formalization of the hawkish/ dovish distinction and also capture the fact that conscription is a targeted policy instrument with high levels of specificity to the projection of 'hard' power. General taxation, on the other hand, is a much more flexible and versatile policy instrument that is often subject to time inconsistencies and commitment problems on the part of policy-makers with own preferences and beliefs. In that sense, conscription policy can be construed as a commitment device for the pursuit of a more assertive (hawkish) foreign policy.

Finally, an interesting variation would examine the role of human capital in both the military and civilian sectors of the economy. The adverse selection problem of raising an all-volunteer army is exaggerated in the model by the assumption of non-transferrable and privately known civilian productivity. In reality, there are plenty of ways to signal one's skills and to separate oneself from a heterogeneous pool of potential recruits. Army recruitment officers around the world have plenty of self-selection incentivizing schemes at their disposal with the goal of attracting a higher-quality pool of candidates with more specialized skills necessary for the deployment of increasingly sophisticated weapons systems. By the same token, the generally accepted egalitarian nature of the draft does not always carve out a representative cross-section of skills within society, once one accounts for different legal ways and loopholes that people with a higher opportunity cost use to decrease their term or avoid serving altogether. Even though these extensions to the model would help us hone our understanding of conscription policy and its causes, the basic intuition of this paper would remain unaltered, both with respect to the redistributional implications of the draft as well as the inextricable link between conscription and foreign policy.

[40] This conceptual distinction made famous and developed by Nye (2004) provides a very intuitive proxy for what I mean by 'hawkish' and 'dovish' foreign policy.

Appendix

Initially I seek to derive the comparative statics of the equilibrium solution of the following system of non-linear equations:

$$\begin{Bmatrix} w^m = (1+\widetilde{\eta})(1-c) - t \\ F(\widetilde{\eta})\, w^m = (1-F(\widetilde{\eta}))\, t \end{Bmatrix}$$

This system has a unique equilibrium that consists of the market-clearing and budget-balancing values of military wage $w^{m*} = w^{m*}(c,t)$ and the cutoff productivity type $\widetilde{\eta}^* = \widetilde{\eta}^*(c,t)$ as functions of the policy instruments of interest: the lump-sum level of income taxation t and the conscription tax c. Linearizing this 2×2 system of non-linear equations by totally differentiating both supply (LC) and demand (BC) functions at the equilibrium $(w^{m*}, \widetilde{\eta}^*)$ yields the following linear system in matrix form:

$$\underbrace{\begin{bmatrix} 1 & -(1-c) \\ F(\widetilde{\eta}^*) & (w^{m*}+t) f(\widetilde{\eta}^*) \end{bmatrix}}_{J} \begin{bmatrix} dw^{m*} \\ d\widetilde{\eta}^* \end{bmatrix} = \begin{bmatrix} -(1+\widetilde{\eta}^*)\, dc - dt \\ (1-F(\widetilde{\eta}^*))\, dt \end{bmatrix} \tag{15}$$

The determinant of the coefficient matrix $\mathbf{J}$ is $|\mathbf{J}| = (w^{m*}+t) f(\widetilde{\eta}^*) + (1-c) F(\widetilde{\eta}^*) > 0$ and it is strictly positive, i.e., the matrix is non-singular for any strictly positive income tax $t > 0$ (while for $t = 0$ I assume the corner solution of $(w^{m*}, 0)$, i.e., no volunteer military force). This proves that a solution always exists and, in fact, it is unique given the monotonicity assumptions about the distribution function.

Finally, using Cramer's rule to solve the above linear system 15

$$\begin{bmatrix} dw^{m*} \\ d\widetilde{\eta}^* \end{bmatrix} = \begin{bmatrix} \frac{-\left(\left(1+\widetilde{\eta}^*\right)dc+dt\right)\left(w^{m*}+t\right)f\left(\widetilde{\eta}^*\right)+(1-c)\left(1-F\left(\widetilde{\eta}^*\right)\right)dt}{|\mathbf{J}|} \\ \frac{\left(1-F\left(\widetilde{\eta}^*\right)\right)dt+\left(\left(1+\widetilde{\eta}^*\right)dc+dt\right)F\left(\widetilde{\eta}^*\right)}{|\mathbf{J}|} \end{bmatrix}$$

eventually yields the following comparative static derivatives:

$$\frac{dw^m}{dc}|_{eq.} = -\frac{(1+\widetilde{\eta}^*)^2 f(\widetilde{\eta}^*)}{F(\widetilde{\eta}^*) + (1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)} \leq 0 \tag{16}$$

$$\frac{dw^m}{dt}|_{eq.} = \frac{(1-F(\widetilde{\eta}^*)) - (1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)}{F(\widetilde{\eta}^*) + (1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)} \lesseqqgtr 0 \tag{17}$$

$$\frac{d\widetilde{\eta}}{dc}|_{eq.} = \frac{(1+\widetilde{\eta}^*) F(\widetilde{\eta}^*)}{(1-c)\left[F(\widetilde{\eta}^*) + (1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)\right]} \geq 0 \tag{18}$$

$$\frac{d\widetilde{\eta}}{dc}|_{eq.} = \frac{1}{(1-c)\left[F(\widetilde{\eta}^*) + (1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)\right]} > 0 \tag{19}$$

Proof of proposition 1. To derive the optimal solution in the proposition, I first solve the two subprograms separately and then combine and compare the local optima. So the *ex ante* (i.e., before the choice of occupation) maximization program is as follows:

$$\underset{\substack{0\leq c\leq 1\\ t\geq 0}}{Max}U^i_{MT} = \max\left\{w^{m*}(c,t), \left(1+\eta^i\right)(1-c)-t\right\} \textit{ subject to}$$

$$F(\widetilde{\eta}^*(c,t)) + c\left[1-F(\widetilde{\eta}^*(c,t))\right] = \overline{M} \text{ and } w^{m*}(c,t)\geq 0$$

The Lagrangean function for the optimization problem with respect to military income is

$$\mathcal{L}^{mil}_{MT} = w^{m*}(c,t) + \lambda\left[\overline{M} - F(\widetilde{\eta}^*(c,t)) - c\left(1-F(\widetilde{\eta}^*(c,t))\right)\right] + \mu_1 w^{m*}(c,t) + \mu_2 c + \mu_3(1-c)$$

By the Kuhn-Tucker theorem, any optimal solution $(c^*, t^*, \lambda^*, \mu_1^*, \mu_2^*, \mu_3^*)$ for military income has to satisfy the following set of necessary first-order and "complementary-slackness" conditions:

$$-\frac{(1+\widetilde{\eta}^*)^2 f(\widetilde{\eta}^*)(1+\mu_1^*)}{F(\widetilde{\eta}^*)+(1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)} - \lambda^*\frac{(1+\widetilde{\eta}^*) f(\widetilde{\eta}^*) + (1-F(\widetilde{\eta}^*))F(\widetilde{\eta}^*)}{F(\widetilde{\eta}^*)+(1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)} + \mu_2^* - \mu_3^* = 0 \qquad (FOC^{c,mil}_{MT})$$

$$-\frac{[(1+\widetilde{\eta}^*) f(\widetilde{\eta}^*) - (1-F(\widetilde{\eta}^*))](1+\mu_1^*)}{F(\widetilde{\eta}^*)+(1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)} - \lambda^*\frac{f(\widetilde{\eta}^*)}{F(\widetilde{\eta}^*)+(1+\widetilde{\eta}^*) f(\widetilde{\eta}^*)} = 0 \qquad (FOC^{t,mil}_{MT})$$

$$\overline{M} - F(\widetilde{\eta}^*) - c^*(1-F(\widetilde{\eta}^*)) = 0 \qquad (FOC^{\lambda,mil}_{MT})$$

$$w^{m*}(c^*,t^*)\geq 0, 0\leq c^*\leq 1, \mu_1^*\geq 0, \mu_2^*\geq 0, \mu_3^*\geq 0$$

$$\mu_1^* w^{m*}(c^*,t^*) = 0, \mu_2^* c^* = 0, \mu_3^*(1-c^*) = 0$$

The non-negative-income constraint makes the non-negative-taxation constraint redundant. I proceed by looking for critical points such that the above system is satisfied. Setting $\mu_3^* > 0$ would imply that $c^* = 1$ and $\overline{M} = 1$; as this is a non-generic case, let $\mu_3^* = 0$.

Assume that $\mu_2^* = 0$. Then substituting for the values of the derivatives in equations 18 and 19 and combining first-order conditions $FOC^{c,mil}_{MT}$ and $FOC^{t,mil}_{MT}$ yields the following condition:

$$(1-F(\widetilde{\eta}^*))^2\left[(1+\widetilde{\eta}^*) f(\widetilde{\eta}^*) + F(\widetilde{\eta}^*)\right] = 0$$

This can be generically satisfied *if and only if* $F(\widetilde{\eta}^*) = f(\widetilde{\eta}^*) = 0$ or $F(\widetilde{\eta}^*) = 1$, which violates the MP constraint for generic values of $\overline{M}$. Hence, this cannot be a local optimum.

Now let $\mu_2^* > 0$, i.e., $c^{mil*} = 0$. Then, from $FOC^{\lambda,mil}_{MT}$, we have that $F(\widetilde{\eta}^*) = \overline{M}$, i.e., an all-volunteer force. and from the budget constraint (BC) we get that

$$t^{mil*} = F(\widetilde{\eta}^*)(1+\widetilde{\eta}^*) = \overline{M}\left(1+F^{-1}\left(\overline{M}\right)\right)$$

Upon substituting for the optimal values of c and t in the professional labor supply function (LC), it turns out that $w^{m*} = (1 - F(\widetilde{\eta}^*))(1 + \widetilde{\eta}^*) = \left(1 - \overline{M}\right)\left(1 + F^{-1}\left(\overline{M}\right)\right)$, which is clearly positive for any generic value of $\overline{M} < 1$. Hence, $\mu_1^* = 0$. Finally, from $FOC_{MT}^{t,mil}$, I derive the value of the multiplier λ^{mil*} as follows:

$$\begin{aligned} \lambda^{mil*} &= \frac{1 - F(\widetilde{\eta}^*)}{f(\widetilde{\eta}^*)} - (1 + \widetilde{\eta}^*) \\ &= \frac{1 - \overline{M}}{f\left(F^{-1}\left(\overline{M}\right)\right)} - \left[1 + F^{-1}\left(\overline{M}\right)\right] \lesseqgtr 0 \end{aligned} \tag{20}$$

The value of the MP-multiplier can be either positive or negative, depending on the shape of the distribution function (more specifically its *inverse hazard* ratio) and the level of $\overline{M}$.

The same optimization problem for civilian income has the following Lagrangean function:

$$\begin{aligned} \mathcal{L}_{MT}^{i,civ} = & \left(1 + \eta^i\right)(1 - c) - t + \lambda\left[\overline{M} - F(\widetilde{\eta}^*(c,t)) - c(1 - F(\widetilde{\eta}^*(c,t)))\right] \\ & + \mu_1 w^{m*}(c,t) + \mu_2 c + \mu_3(1 - c) \end{aligned}$$

Note that the non-negative-income constraint can only be binding for military income as this will be the base income in the economy. As previously, any local optimum $(c^*, t^*, \lambda^*, \mu_1^*, \mu_2^*, \mu_3^*)$ has to satisfy the following set of necessary first-order and "complementary slackness" conditions, where $\frac{dw^{m*}}{dc}, \frac{dw^{m*}}{dt}$ are as given in expressions 16, 17:

$$\begin{aligned} & -\left(1 + \eta^i\right) - \lambda^* \frac{(1 + \widetilde{\eta}^*) f(\widetilde{\eta}^*) + (1 - F(\widetilde{\eta}^*)) F(\widetilde{\eta}^*)}{F(\widetilde{\eta}^*) + (1 + \widetilde{\eta}^*) f(\widetilde{\eta}^*)} \\ & - \frac{(1 + \widetilde{\eta}^*)^2 f(\widetilde{\eta}^*) \mu_1^*}{F(\widetilde{\eta}^*) + (1 + \widetilde{\eta}^*) f(\widetilde{\eta}^*)} + \mu_2^* - \mu_3^* = 0 \end{aligned} \tag{$FOC_{MT}^{c,civ}$}$$

$$-1 - \lambda^* \frac{f(\widetilde{\eta}^*)}{F(\widetilde{\eta}^*) + (1 + \widetilde{\eta}^*) f(\widetilde{\eta}^*)} - \frac{\left[(1 + \widetilde{\eta}^*) f(\widetilde{\eta}^*) - (1 - F(\widetilde{\eta}^*))\right] \mu_1^*}{F(\widetilde{\eta}^*) + (1 + \widetilde{\eta}^*) f(\widetilde{\eta}^*)} = 0 \tag{$FOC_{MT}^{t,civ}$}$$

$$\overline{M} - F(\widetilde{\eta}^*) - c^*(1 - F(\widetilde{\eta}^*)) = 0 \tag{$FOC_{MT}^{\lambda,civ}$}$$

$$w^{m*}(c,t) \geq 0, 0 \leq c^* \leq 1, \mu_1^* \geq 0, \mu_2^* \geq 0, \mu_3^* \geq 0$$

$$\mu_1^* w^{m*} = 0, \mu_2^* c^* = 0, \mu_3^*(1 - c^*) = 0$$

As before, let $\mu_2^* > 0$, i.e., for high-skilled individuals optimal conscription is $c^{HI*} = 0$. Then, from $FOC_{MT}^{\lambda,civ}$, we have that $F(\widetilde{\eta}^*) = \overline{M}$, i.e., an all-volunteer force, and from the budget constraint (BC) we get that

$$t^{HI*} = F(\widetilde{\eta}^*)(1 + \widetilde{\eta}^*) = \overline{M}\left(1 + F^{-1}\left(\overline{M}\right)\right)$$

I then combine $FOC_{MT}^{t,civ}$, $FOC_{MT}^{c,civ}$, $F(\widetilde{\eta}^*) = \overline{M}$, and the fact that $\mu_2^* > 0$ to derive the following condition for this corner solution:

$$\eta^i > F^{-1}\left(\overline{M}\right) + \frac{\overline{M}\left(1-\overline{M}\right)}{f\left(F^{-1}\left(\overline{M}\right)\right)} = H\left(F^{-1}\left(\overline{M}\right)\right)$$

This is the cut-off type separating the medium-income from the high-income class. After a bit of algebra, one can find the value of the HI multiplier λ^{HI*} as follows:

$$\lambda^{HI*} = -\left(1 + F^{-1}\left(\overline{M}\right) + \frac{\overline{M}}{f\left(F^{-1}\left(\overline{M}\right)\right)}\right) < 0 \tag{21}$$

Combining the definition of the Γ function in equation 5 with the expression 21 for the multiplier yields that $\lambda^{HI*} = -1 - \Gamma\left(F^{-1}\left(\overline{M}\right)\right)$.

Now let $\mu_2^* = 0$. Then substituting for the values of the derivatives in equations 18 and 19 and combining first-order conditions $FOC_{MT}^{c,civ}$ and $FOC_{MT}^{t,civ}$ yields the following condition:

$$\eta^i = \widetilde{\eta}^* + \frac{\left(1 - F\left(\widetilde{\eta}^*\right)\right) F\left(\widetilde{\eta}^*\right)}{f\left(\widetilde{\eta}^*\right)} \equiv H\left(\widetilde{\eta}^*\right) \tag{22}$$

This optimality condition implicitly defines the civilian-income-maximizing cutoff productivity type for each medium productivity type $\eta^i \geq 0$. For the inverse function $H^{-1}\left(\eta^i\right) = \widetilde{\eta}^*$ to exist, the $H(\cdot)$ function has to be *one-to-one* or *injective*; therefore, it would be sufficient to ensure that the function is monotonically increasing, i.e.,

$$H'\left(\widetilde{\eta}^*\right) = \left(1 - F\left(\widetilde{\eta}^*\right)\right)\left(2f\left(\widetilde{\eta}^*\right)^2 - f''\left(\widetilde{\eta}^*\right) F\left(\widetilde{\eta}^*\right)\right) > 0,$$

which gives us condition 1 for interior values $\widetilde{\eta}^* \in (0,1)$. Moreover, $H\left(\widetilde{\eta}^*\right) \underset{\widetilde{\eta}^* \to 0}{\longrightarrow} 0$, $H'(0) \geq 0$, and $H\left(\widetilde{\eta}^*\right) \underset{\widetilde{\eta}^* \to \infty}{\longrightarrow} \infty$. Substituting for $\widetilde{\eta}^* = H^{-1}\left(\eta^i\right)$ in $FOC_{MT}^{\lambda,civ}$ leads to c^{MI*} as in 3 and combining (LC) and (BC) gives $t^{MI*} = F\left(\widetilde{\eta}^*\right)\left(1 + \widetilde{\eta}^*\right)\left(1 - c^{MI*}\right)$. Further algebra leads to the expression in equation 4. By the same reasoning as above, set $\mu_1^* = 0$. Then, substituting for $\widetilde{\eta}^*$ and μ_1^* in $FOC_{MT}^{t,civ}$ gives the optimal value of the medium-income multiplier as follows:

$$\text{and } \lambda^{MI*} = -\left(1 + \widetilde{\eta}^* + \frac{F\left(\widetilde{\eta}^*\right)}{f\left(\widetilde{\eta}^*\right)}\right) = -\left(1 + H^{-1}\left(\eta^i\right) + \frac{F\left(H^{-1}\left(\eta^i\right)\right)}{f\left(H^{-1}\left(\eta^i\right)\right)}\right) < 0 \tag{23}$$

Again, combining the definition of the Γ function in equation 5 with the expression 23 for the medium-income multiplier yields that $\lambda^{MI*} = -1 - \Gamma\left(H^{-1}\left(\eta^i\right)\right)$.

Finally, to find the globally optimal solution, one has to compare the indirect utility of local optima. Comparing HI civilian income with LI (military) income comes down to $\eta^i > \widetilde{\eta}^* = H^{-1}\left(\eta^i\right)$, which is always true for interior values of η^i. Hence, by definition, all HI types will opt for a civilian career. This is not necessarily true for MI types. For medium-income types to choose the civilian sector, it has to be the case that

$$
\begin{aligned}
y^{MI*}\left(c^{MI*}, t^{MI*}\right) &\geq w^{m*}\left(c^{LI*}, t^{LI*}\right) \\
\frac{1-\overline{M}}{1-F\left(\widetilde{\eta}^{*}\right)}\left[\left(1+H\left(\widetilde{\eta}^{*}\right)\right)-F\left(\widetilde{\eta}^{*}\right)\left(1+\widetilde{\eta}^{*}\right)\right] &\geq \left(1-\overline{M}\right)\left(1+F^{-1}\overline{M}\right) \\
\Gamma\left(\widetilde{\eta}^{*}\right) \equiv \widetilde{\eta}^{*}+\frac{F\left(\widetilde{\eta}^{*}\right)}{f\left(\widetilde{\eta}^{*}\right)} &\geq F^{-1}\left(\overline{M}\right)
\end{aligned}
$$

Function $\Gamma(\cdot)$, which by condition 1 is also monotonically increasing and starts from the origin, defines the threshold type that is indifferent between a civilian and a military career. ■

Proof of proposition 2. Long-term utility maximization includes one additional variable of optimization (M) subject to an endowment constraint $M \in [0,1]$. The quasi-linearity of the utility function allows us to follow the exact same procedure as above using the appropriate conditions in each case with the further addition of a first-order condition with respect to M as well as the corresponding "complementary slackness" conditions. Thus I get the following Lagrangean functions with respect to military and civilian income respectively:

$$
\begin{aligned}
\mathcal{L}_{LT}^{mil} = \; & w^{m*}(c,t)+V(S(M;\phi))+\lambda\left[M-F\left(\widetilde{\eta}^{*}(c,t)\right)-c\left(1-F\left(\widetilde{\eta}^{*}(c,t)\right)\right)\right] \\
& +\mu_{1} w^{m*}(c,t)+\mu_{2} c+\mu_{3}(1-c)+\mu_{4} M+\mu_{5}(1-M)
\end{aligned}
\tag{24}
$$

$$
\begin{aligned}
\mathcal{L}_{LT}^{i,civ} = \; & \left(1+\eta^{i}\right)(1-c)-t+V(S(M;\phi))+\lambda[M-F\left(\widetilde{\eta}^{*}(c,t)\right) \\
& -c\left(1-F\left(\widetilde{\eta}^{*}(c,t)\right)\right)]+\mu_{1} w^{m*}(c,t)+\mu_{2} c+\mu_{3}(1-c)+\mu_{4} M+\mu_{5}(1-M)
\end{aligned}
\tag{25}
$$

So, while the rest remains the same as in medium term, the additional first-order condition with respect to army size for both the military and the civilian programs is as follows:

$$
V_{S} S_{M}\left(M^{*};\phi\right)+\lambda^{*}+\mu_{4}^{*}-\mu_{5}^{*}=0, \tag{FOC_{LT}^{M}}
$$

where $\mu_{4}^{*}, \mu_{5}^{*} \geq 0$, $\mu_{4}^{*} M^{*}=0$, and $\mu_{5}^{*}\left(1-M^{*}\right)=0$. I proceed to study the various critical points for both programs simultaneously.

Let $\mu_{2}^{*}>0$. This implies that $c^{*}=0$, $\mu_{3}^{*}=0$, and, from FOC_{LT}^{λ}, $F\left(\widetilde{\eta}^{*}\right)=M^{*}$. Assuming that $\mu_{4}^{*}>0$, we get that $M^{*}=0$, $\mu_{5}^{*}=0$, from FOC_{LT}^{λ} that $\widetilde{\eta}^{*}=F^{-1}(0)=0$, and hence from (BC) that $t^{*}=0$. Then, given the distributional assumptions, the first-order conditions with respect to c and t for military income become $-\left(1+\mu_{1}^{*}\right)-\lambda^{*}+\mu_{2}^{*}=0$ $\left(FOC_{LT}^{c,mil}\right)$ and $\frac{1-f(0)}{f(0)}\left(1+\mu_{1}^{*}\right)-\lambda^{*}=0$ $\left(FOC_{LT}^{t,mil}\right)$ respectively. Solving them together, we get $\lambda^{mil*}=\frac{1-f(0)}{f(0)}\left(1+\mu_{1}^{*}\right)$ and $\mu_{2}^{*}=\frac{1+\mu_{1}^{*}}{f(0)}$, where $\mu_{1}^{*} \geq 0$. Similarly for civilian income we have that $\lambda^{civ*}=-1$ (from $FOC_{LT}^{t,civ}$) and $\mu_{2}^{*}=\eta^{i}$ (from $FOC_{LT}^{c,civ}$). Finally, from

FOC^{M}_{LT} and for $\mu_4^* > 0$, I derive triviality condition $V_S S_M(0;\phi) < 1$. After confirming that the Jacobian matrix of 'effective' constraints ($\lambda^* < 0, \mu_2^* > 0, \mu_4^* > 0$) is of maximal rank, i.e., the *non-degenerate constraint qualification* (NDCQ) is satisfied, this turns out to be a trivial corner solution $(c^*, t^*, M^*) = (0,0,0)$ of full demilitarization.

Now let $\mu_2^* > 0$ and $\mu_4^* = 0$. Looking at the military income problem first, we have that $\mu_1^* = 0$, since otherwise $w^{m*} = 0$ would imply that $M^* = F(\widetilde{\eta}^*) = 1$, which does not generally hold for a concave function $V(\cdot)$. Then, substituting for $\widetilde{\eta}^* = F^{-1}(M^*)$ and combining first-order conditions FOC^{M}_{LT} and $FOC^{t,mil}_{LT}$ yields the lower-income (LI) condition for optimal army size in expression 8. So $\left(0, M^{LI*}\left(1+F^{-1}\left(M^{LI*}\right)\right), M^{LI*}\right)$ is a local optimum. Note that λ^{mil*}, i.e., the marginal effect of an increase in army size on military income, remains the same as in the medium run. In the case of the civilian sector, substituting for $\widetilde{\eta}^* = F^{-1}(M^*)$ and combining first-order conditions $FOC^{c.civ}_{LT}$ and $FOC^{t,civ}_{LT}$ with the fact that $\mu_2^* > 0$ gives us the lower bound of the high-income class, i.e.,

$$\eta^i > F^{-1}\left(M^{HI*}\right) + \frac{M^{HI*}\left(1-M^{HI*}\right)}{f\left(F^{-1}\left(M^{HI*}\right)\right)} \equiv \left(H \circ F^{-1}\right)\left(M^{HI*}\right)$$

Note that $\mu_5^* = 0$, since otherwise the above condition can never be satisfied for $M^{HI*} = 1$, which also implies that $w^{m*} = \left(1+F^{-1}\left(M^{HI*}\right)\right)\left(1-M^{HI*}\right) > 0$ for $M^{HI*} < 1$, hence $\mu_1^* = 0$. Finally, substituting in first-order condition FOC^{M}_{LT} yields the respective high-income (HI) condition for optimal military force in expression 6. The optimal high-income policy solution $\left(0, M^{HI*}\left(1+F^{-1}\left(M^{HI*}\right)\right), M^{HI*}\right)$ also satisfies the NDCQ constraint.

Now let us examine the case of $\mu_2^* = 0$. First, it is quite straightforward to use proof by contradiction to show that $\mu_3^* = \mu_4^* = \mu_5^* = 0$ for both the military and the civilian case. For those who plan to follow a military career, combining $FOC^{c,mil}_{LT}$ and $FOC^{t,mil}_{LT}$ leads to $F(\widetilde{\eta}^*) = 1$ and from FOC^{λ}_{LT} to $M^{LI*} = 1$, which does not generally hold for a concave function $V(\cdot)$. Hence, it is not a critical point in the military subprogram. In the civilian case, however, combining first-order conditions $FOC^{c.civ}_{LT}$ and $FOC^{t,civ}_{LT}$ yields the following medium-income optimality condition

$$\eta^i = \widetilde{\eta}^* + \frac{\left(1-F(\widetilde{\eta}^*)\right)F(\widetilde{\eta}^*)}{f(\widetilde{\eta}^*)} \equiv H(\widetilde{\eta}^*)$$

Substituting in FOC^{M}_{LT} for $\lambda^{MI*} = -\left(1+\Gamma(\widetilde{\eta}^*)\right)$ and $\widetilde{\eta}^* = H^{-1}\left(\eta^i\right)$ gives us the medium-income optimal force size in expression 7. Finally, substituting back into (LC) and (BC) I find the utility-maximizing medium-income (MI) interior solution $\left(c^{MI*}, t^{MI*}, M^{MI*}\right)$ as a function of η^i as stated in proposition 2. This verifiably satisfies the NDCQ constraint.

To complete the proof, I need to find the globally optimal *ex ante* solution by comparing indirect utility at the local optima for each choice of occupation. By the Envelope Theorem, optimized long-term civilian utility

$U_{LT}^{i,civ*} = y^{i,civ*}\left(c,t;\eta^i\right) + V\left(S\left(M;\phi\right)\right)$ is strictly increasing in productivity type. Hence, there exists a unique threshold type $\widehat{\eta}\left(\phi\right)$ such that $U_{LT}^{civ*}\left(\widehat{\eta}\left(\phi\right)\right) = U_{LT}^{i,mil*}$. For generic distribution functions $F\left(\cdot\right)$, high-income types are always in favor of smaller all-volunteer forces $\left(M^{HI*} < M^{LI*}\right)$ compared to the military class; hence, the cutoff type $\widehat{\eta}\left(\phi\right)$ earns medium-income civilian utility, which implies indifference condition 9. ■

Proof of proposition 3. Following a similar approach as above, this time we need to distinguish between the following two programs for $\delta \geq F\left(\widetilde{\eta}^*\right)$ and $\delta < F\left(\widetilde{\eta}^*\right)$ respectively. The first case implies that the government will seek to maximize the aggregate utility of its civilian enfranchised population, so that the optimization program becomes as follows:

$$\underset{\substack{0\leq M\leq 1\\ 0\leq c\leq 1\\ t\geq 0}}{Max}\, W_{LT}^{\delta} = \int\limits_{F^{-1}(\delta)}^{\infty}\left[\left(1+\eta^i\right)(1-c)-t\right]dF\left(\eta^i|\eta^i \geq F^{-1}\left(\delta\right)\right) + V\left(S\left(M;\phi\right)\right)$$

$$\textit{subject to } \ (MP) \ \text{ and } w^{m*}\left(c,t\right) \geq 0$$

Setting up the Lagrangean function and differentiating with respect to c yields the following necessary first-order condition:

$$\underbrace{-\frac{1}{1-\delta}\int\limits_{F^{-1}(\delta)}^{\infty}\left(1+\eta^i\right)dF\left(\eta^i\right)}_{E\left(\eta^i|\eta^i\geq F^{-1}(\delta)\right)=\Theta(\delta)} - \lambda^*\frac{\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)+\left(1-F\left(\widetilde{\eta}^*\right)\right)F\left(\widetilde{\eta}^*\right)}{F\left(\widetilde{\eta}^*\right)+\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)}$$
$$-\frac{\left(1+\widetilde{\eta}^*\right)^2 f\left(\widetilde{\eta}^*\right)\mu_1^*}{F\left(\widetilde{\eta}^*\right)+\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)} + \mu_2^* - \mu_3^* = 0 \qquad (FOC_{LT}^{c,\delta})$$

The rest of the conditions remain the same as in the case of the long-term civilian optimization program. Hence, the optimal solution to this program corresponds to the ideal point of the mean enfranchised civilian type. So, substituting for $\eta^i = \Theta\left(\delta\right)$ in the long-term civilian utility-maximizing solutions from proposition 2, we get that $\left(c_{LT}^{\delta*}, t_{LT}^{\delta*}, M_{LT}^{\delta*}\right) = \left(0, M^{HI*}\left(1+F^{-1}\left(M^{HI*}\right)\right), M^{HI*}\right)$ *if and only if* $\Theta\left(\delta\right) > \left(H\circ F^{-1}\right)\left(M^{HI*}\right)$ and $\delta \geq M^{HI*}$ or $= \left(c^{MI*}\left(\Theta\left(\delta\right)\right), t^{MI*}\left(\Theta\left(\delta\right)\right), M^{HI*}\right)$ *if and only if* $\Theta\left(\delta\right) \leq \left(H\circ F^{-1}\right)\left(M^{HI*}\right)$ and $\delta \geq \left(F\circ H^{-1}\right)\left(\Theta\left(\delta\right)\right)$, where M^{HI*} and M^{MI*} are implicitly defined by equations 11 and 12 respectively.

For $\delta < F\left(\widetilde{\eta}^*\right)$, i.e., for a partially enfranchised lower-income class, the optimization program is the following:

$$\underset{\substack{0\leq M\leq 1\\ 0\leq c\leq 1\\ t\geq 0}}{Max}\, W_{LT}^{\delta} = \int\limits_{F^{-1}(\delta)}^{\widetilde{\eta}^*(c,t)} w^{m*}(c,t)\, dF\left(\eta^i|\eta^i \geq F^{-1}(\delta)\right)$$

$$+ \int\limits_{\widetilde{\eta}^*(c,t)}^{\infty} \left[\left(1+\eta^i\right)(1-c) - t\right] dF\left(\eta^i|\eta^i \geq F^{-1}(\delta)\right)$$

$$+ V\left(S\left(M;\phi\right)\right) \ \textit{subject to} \ \ (MP) \ \text{and} \ w^{m*}(c,t) \geq 0, \forall \eta^i \geq 0$$

Setting up the Lagrangean function and differentiating with respect to c and t yields the following necessary first-order conditions:

$$-\frac{1}{1-\delta}\int\limits_{\widetilde{\eta}^*(c^*,t^*)}^{\infty}\left(1+\eta^i\right)dF\left(\eta^i\right) - \frac{\left(1+\widetilde{\eta}^*\right)^2 f\left(\widetilde{\eta}^*\right)}{F\left(\widetilde{\eta}^*\right)+\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)}\left(\frac{F\left(\widetilde{\eta}^*\right)-\delta}{1-\delta}+\mu_1^*\right)$$

$$-\lambda^{\delta*}\frac{\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)+\left(1-F\left(\widetilde{\eta}^*\right)\right)F\left(\widetilde{\eta}^*\right)}{F\left(\widetilde{\eta}^*\right)+\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)}+\mu_2^*-\mu_3^*=0 \qquad (FOC_{LT}^{c,\delta})$$

$$-\frac{1-F\left(\widetilde{\eta}^*\right)}{1-\delta} - \frac{\left[\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)-\left(1-F\left(\widetilde{\eta}^*\right)\right)\right]}{F\left(\widetilde{\eta}^*\right)+\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)}\left(\frac{F\left(\widetilde{\eta}^*\right)-\delta}{1-\delta}+\mu_1^*\right)$$

$$-\lambda^{\delta*}\frac{f\left(\widetilde{\eta}^*\right)}{F\left(\widetilde{\eta}^*\right)+\left(1+\widetilde{\eta}^*\right)f\left(\widetilde{\eta}^*\right)}=0 \qquad (FOC_{LT}^{t,\delta})$$

These are effectively weighted linear combinations of the corresponding FOCs for the civilian and military groups of the enfranchised population. The rest of the conditions remain the same as in the case of the long-term civilian optimization program.

For $\mu_1^* = \mu_3^* = \mu_4^* = \mu_5^* = 0$ and $\mu_2^* > 0$, combining first-order conditions $FOC_{LT}^{c.\delta}$ and $FOC_{LT}^{t,\delta}$ reveals that the corner solution of this program $(c^* = 0)$ has to be subject to the following condition:

$$E\left(\eta^i|\eta^i \geq F^{-1}\left(M^{LI(\delta)*}\right)\right) = \Theta\left(M^{LI(\delta)*}\right) > F^{-1}\left(M^{LI(\delta)*}\right) + \frac{\delta\left(1-M^{LI(\delta)*}\right)}{f\left(F^{-1}\left(M^{LI(\delta)*}\right)\right)}$$

From FOC_{LT}^{M}, it turns out that $M^{LI(\delta)*}$ is implicitly defined by equation 14. So we have that $\left(c_{LT}^{\delta*}, t_{LT}^{\delta*}, M_{LT}^{\delta*}\right) = \left(0, M^{LI(\delta)*}\left(1+F^{-1}\left(M^{LI(\delta)*}\right)\right), M^{LI(\delta)*}\right)$ *if and only if* $\delta < M^{LI(\delta)*}$and the above condition is satisfied. For $\mu_1^* = \mu_2^* = \mu_3^* = \mu_4^* = \mu_5^* = 0$, combining conditions $FOC_{LT}^{c,\delta}$ and $FOC_{LT}^{t,\delta}$ yields the following optimality condition

$$E\left(\eta^i|\eta^i \geq \widetilde{\eta}^{\delta*} > F^{-1}(\delta)\right) = \Theta\left(F\left(\widetilde{\eta}^{\delta*}\right)\right) = \widetilde{\eta}^{\delta*} + \frac{\delta\left(1-F\left(\widetilde{\eta}^{\delta*}\right)\right)}{f\left(\widetilde{\eta}^{\delta*}\right)},$$

where $\widetilde{\eta}^{\delta *}$ denotes the military cutoff-type in this interior solution Then, substituting for $\lambda^{\delta *}$ in FOC_{LT}^{M}, yields equation 13 that implicitly defines $M^{MI(\delta)*}$. This global optimum exists *if and only if* $\Theta\left(M^{LI(\delta)*}\right) \leq F^{-1}\left(M^{LI(\delta)*}\right) + \frac{\delta\left(1-M^{LI(\delta)*}\right)}{f\left(F^{-1}\left(M^{LI(\delta)*}\right)\right)}$ and $\delta < F\left(\widetilde{\eta}^{\delta *}\right)$. To sum up, merging the above four local optima yields the solution in proposition 3. It should be noted that the derived interior solutions ($c^{*} > 0$) in the overall optimization program are not guaranteed to exist. ■

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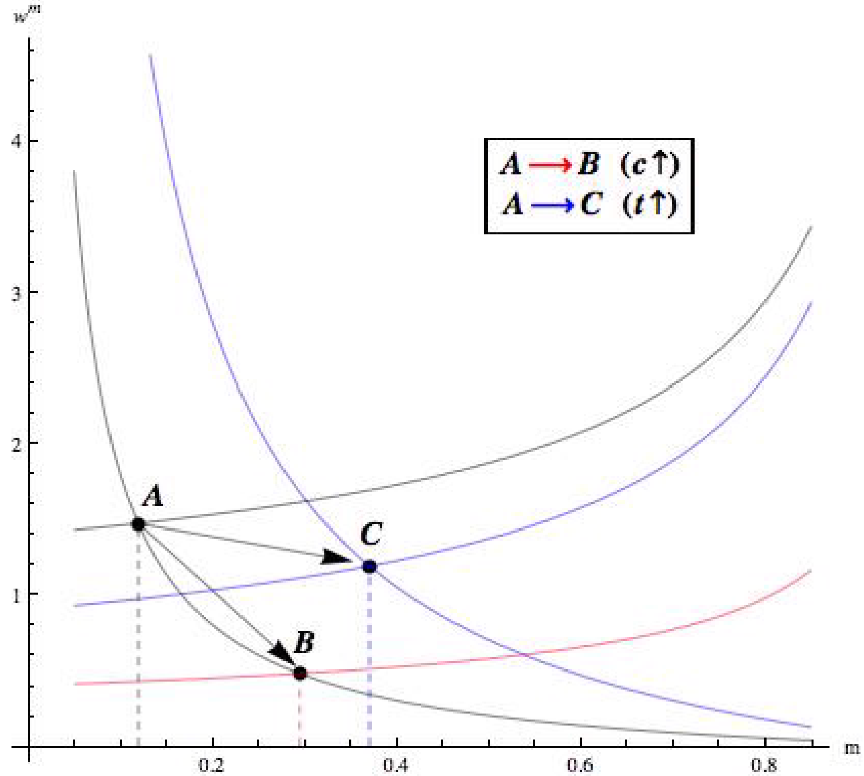

Figure 1: This is a typical illustration of a demand and supply general equilibrium of the volunteer army. Starting from an initial equilibrium (m^*, w^{m*}) at point A, the graph shows the comparative statics of an increase in the level of conscription c (from A to B) that only has the effect of shifting the LC curve, hence raising the equilibrium size of the professional army and suppressing military wages. An exogenous increase in the lum-sum tax t (from A to C) has the effect of shifting both the LC and BC curves to the right, thus increasing m^*, while the comparative statics of w^{m*} remain ambiguous.

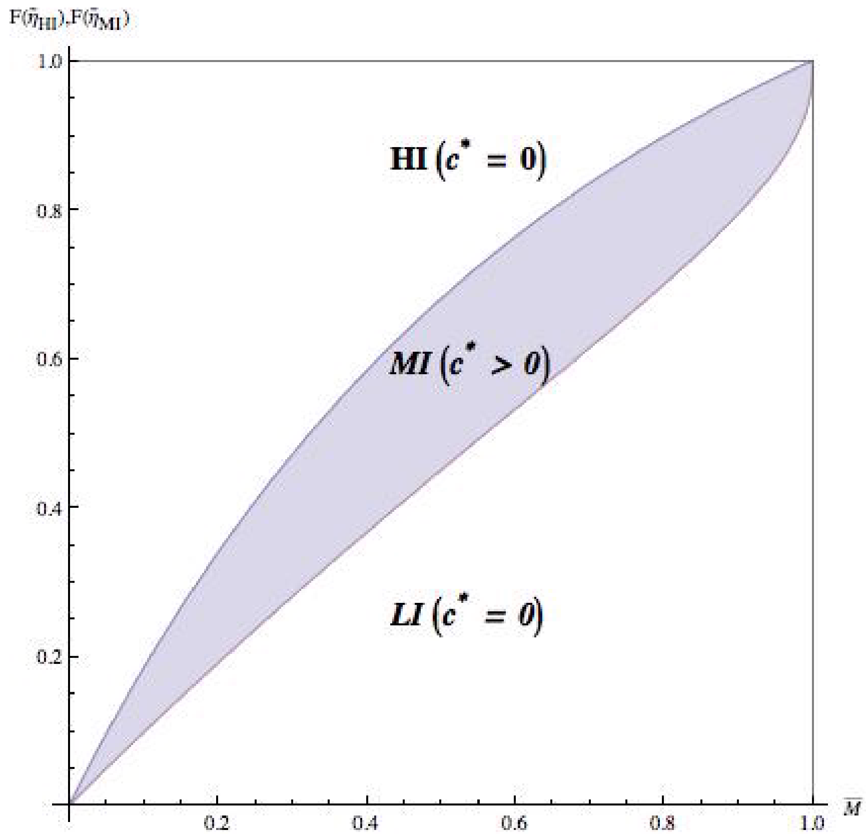

Figure 2: This is a plot of the cumulative distribution function F of the upper $\left(\widetilde{\eta}_{HI}\left(\overline{M}\right) = \left(H \circ F^{-1}\right)\left(\overline{M}\right)\right)$ and the lower $\left(\widetilde{\eta}_{MI}\left(\overline{M}\right) = \left(H \circ \Gamma^{-1} \circ F^{-1}\right)\left(\overline{M}\right)\right)$ threshold productivity types demarcating the 'boundaries' between the different groups. Productivity types η^i are assumed to be Pareto distributed with a starting value $\eta \min = 1$ and a Pareto index $\alpha = 2$. For any given $\overline{M} \in [0, 1]$, the distance of the upper curve from the top denotes the fraction size of the high-income group, the distance between the two curves denotes that of the middle-income class, and the lower curve equals the fraction size of the low-income military class.

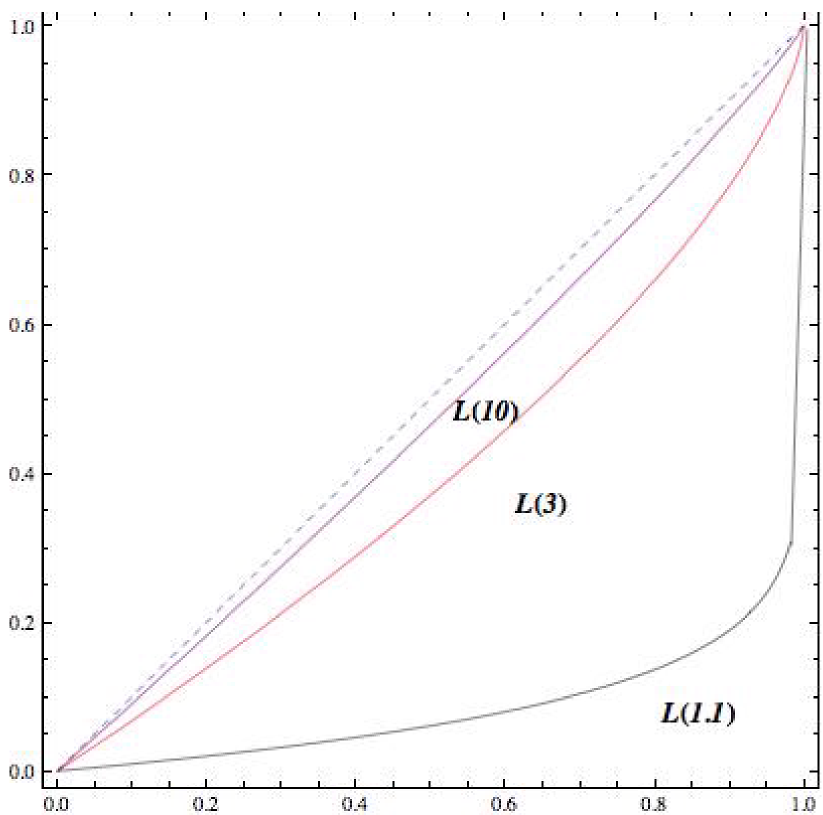

Figure 3: This is a graphical illustration of three Lorenz curves for different values of the shape parameter $\alpha > 1$ of a Pareto distribution with minimum value $\eta_{\min} = 1$. The x-axis measures bottom percentiles of the population, while the y-axis measures the fraction of total wealth held by a bottom F fraction of the population. The closer the curve is to the 45° degree line of perfect equality, the less unequal the distribution. The Gini coefficient effectively equals twice the area between the Lorenz curve and the perfect equality line.

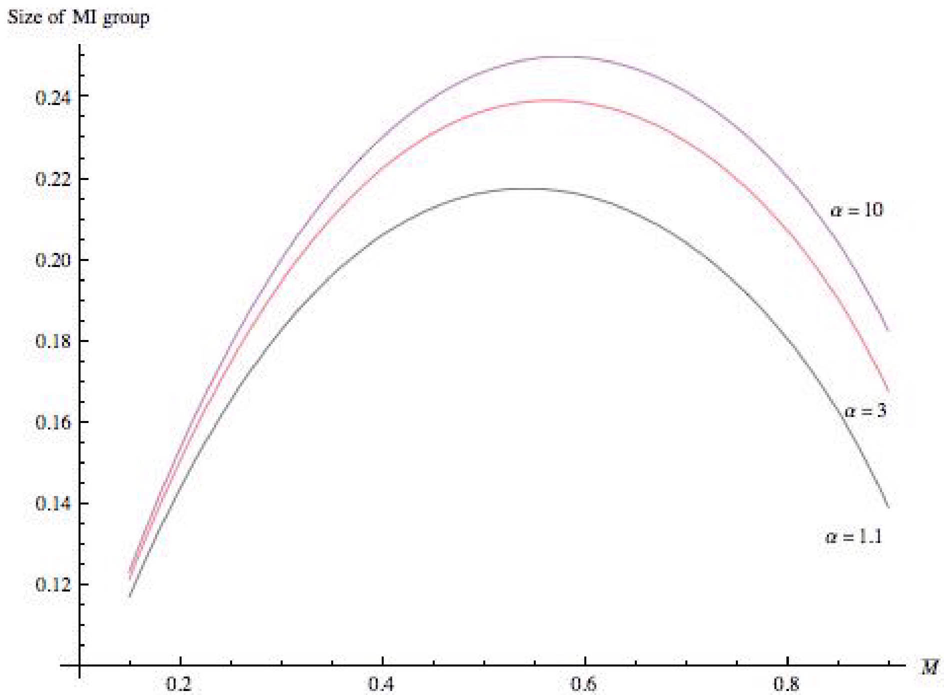

Figure 4: For $V\left(S\left(M;\phi\right)\right) = \phi \ln M$ and $\eta^i \sim Pareto\left(1,\alpha\right)$, where $\alpha \in \{1.1, 3, 10\}$, this figure shows that there is an inverted-U type of relationship between total military size $\overline{M}$ and the size of the middle-income pro-conscription class, where the latter is maximized for medium levels of security threat and military mobilization. For increasing levels of inequality ($\alpha \downarrow$), the size of the pro-conscription constituency is lower at every value of $\overline{M}$.

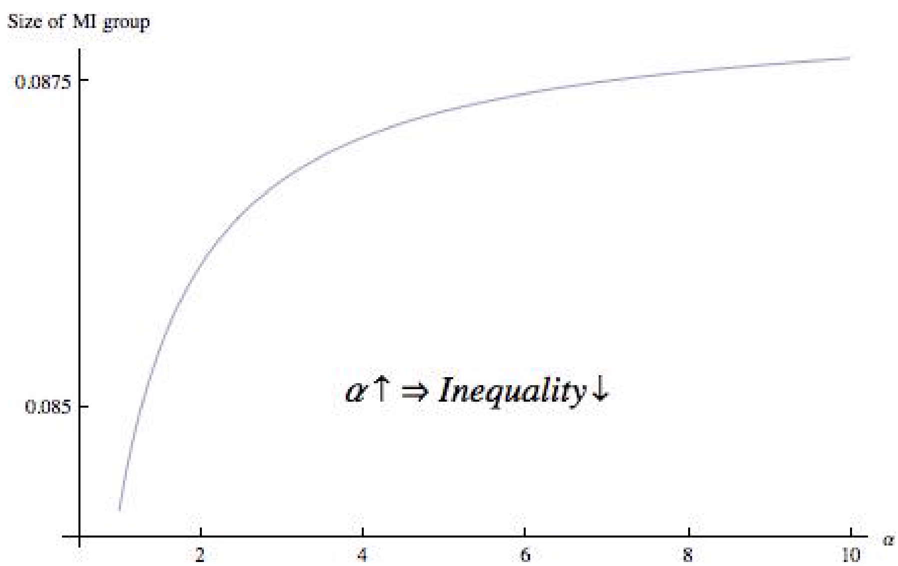

Figure 5: For For $V(S(M;\phi)) = \phi \ln M$ and $\eta^i \sim Pareto(1,\alpha)$, the size of the middle-income group (MI) is monotonically decreasing in the level of inequality as captured by the Pareto index α.

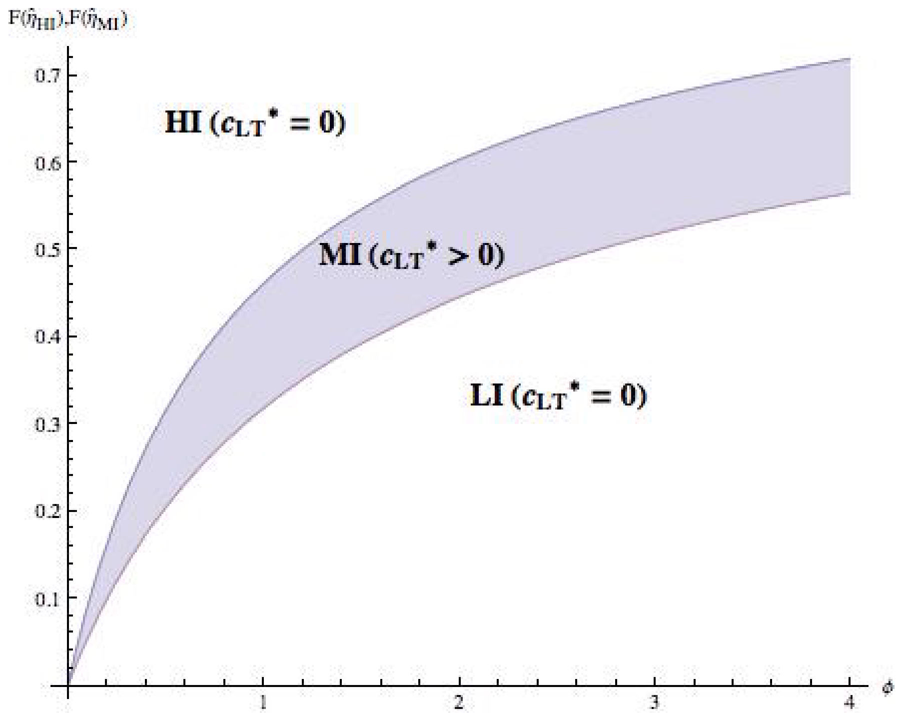

Figure 6: Using the same functional specification as before $(V(S^i(M;\phi,t^i)) = \phi \ln M - \phi t^i$ and $\eta^i \sim Pareto(1,\alpha))$, this is a plot of the cumulative distribution function F of the upper $\left(\widehat{\eta}_{HI}(\phi,0) = \left(H \circ F^{-1}\right)\left(M^{HI*}(\phi,0)\right)\right)$ and the lower $(\widehat{\eta}_{MI}(\phi,1) = \widehat{\eta}(\phi,1))$ threshold types with respect to the level of external threat ϕ. For any given $\phi > 0$, the distance of the upper curve from the top denotes the fraction size of the high-income group, the distance between the two curves denotes that of the middle-income class, and the lower curve equals the fraction size of the low-income military class.

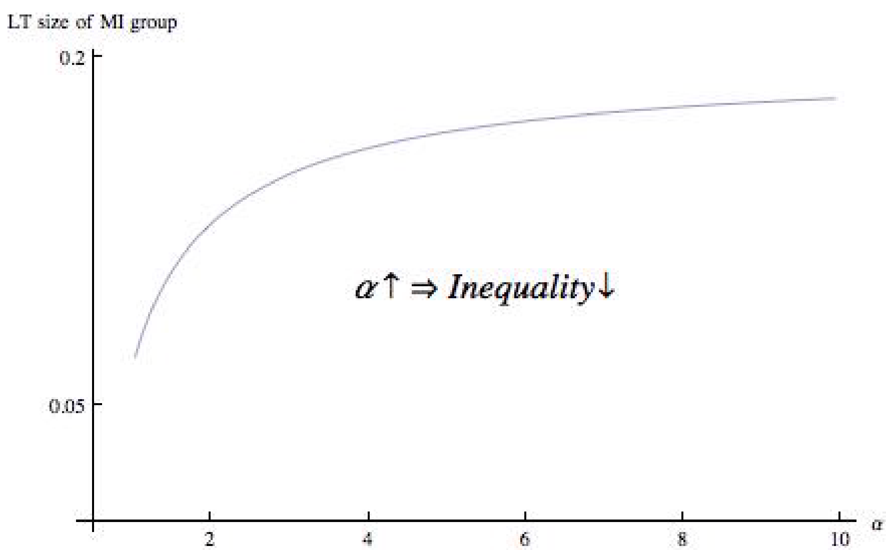

Figure 7: For increasing levels of inequality ($\alpha\downarrow$), the size of the pro-conscription constituency is monotonically decreasing for all values of ϕ.

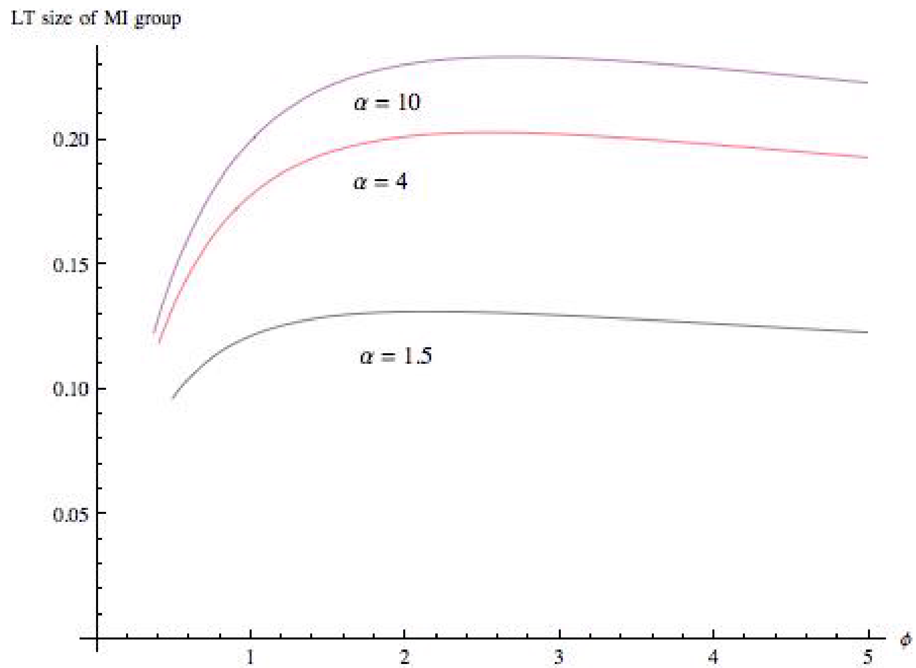

Figure 8: For $V\left(S^i\left(M;\phi,t^i\right)\right) = \phi \ln M - \phi t^i$ and $\eta^i \sim Pareto\,(1,\alpha)$, where $\alpha \in \{1.5, 4, 10\}$, this figure shows that there is a curvilinear relationship between the security parameter ϕ and the size of the middle-income pro-conscription class, where the latter is maximized for moderate levels of security threat and military mobilization. Note that the relative size is invariably less for increasing levels of inequality (α).

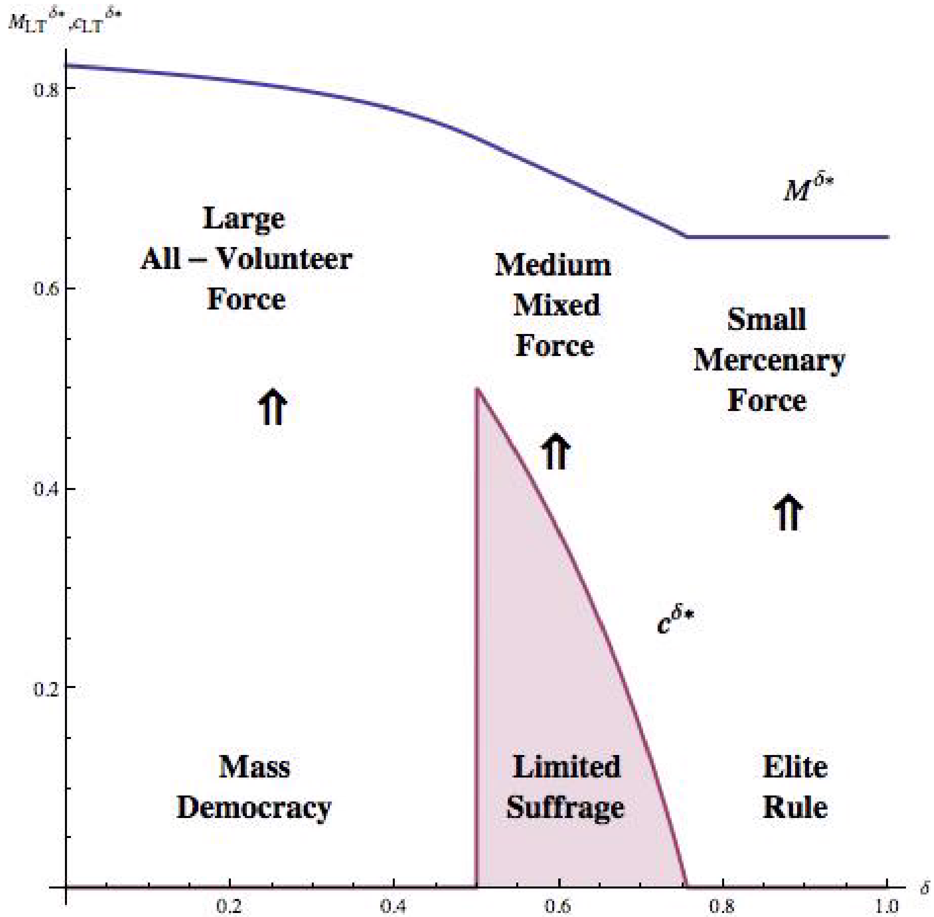

Figure 9: This is a graphical illustration of the long-term relationship between army size $\left(M_{LT}^{\delta*}\right)$, conscription policy $\left(c_{LT}^{\delta*}\right)$, and level of enfranchisement (δ), with the following functional and parametric specification: $\eta^i \sim U[0,1]$, $V(S(M;\phi)) = \phi \ln M$, and $\phi = 1.5$. The limited suffrage 'pocket' of conscription is expected to arise for medium levels of ϕ and it is not robust to the specification of the income distribution function.