Volunteer Militaries, The Draft, and Support for War

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02/02/2010

Abstract

This paper models how a nation's military manpower procurement system affects popular support for war and political choices regarding war. When citizens have idiosyncratic benefits from war and costs from serving, I characterize when a volunteer military maximizes support, and when a mixture of volunteer and conscripted forces does. Pure conscription never maximizes support. The personnel systems cannot be ranked ex-ante by efficiency, because each makes mistakes the other avoids. Ceteris paribus, political systems requiring only weak support to initiate wars have more war under pure conscription, while those requiring strong support have more war under a volunteer system.

JEL Classification: H56, D78

Keywords: Conscription, Militarism, The Draft

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1 Introduction

The presence and extent of military conscription has varied widely across nations and over time. Within the United States, the military moved from localized levies to the first national draft during the civil war, the introduction of selective service during the world wars, and the advent of the all-volunteer force in the aftermath of Vietnam.[1] Other countries have followed similar patterns, strengthening and weakening conscription provisions over time.[2] There remains substantial variation in the use of conscription with nearly half the countries in the world with a military using some degree of conscription as a part of the military manpower procurement policy (CSUCS, 2008).

The experimentation with different manpower procurement policies continues today. Over the past three decades, many nations have either implemented or considered substantial changes to their military manpower procurement systems. Several European countries abolished long-standing conscription programs, including Belgium, Czech Republic, France, Hungary, Italy, Portugal, and Spain. In the same period, several other countries instituted new conscription systems, including Malaysia, Mozambique, and Zimbabwe, and several other countries considered reviving old systems. U.S. Congressman Charles Rangel has recently called for reinstating the draft.[3] Similar calls have gone out in Britain, South Africa, and Australia over the past decade.[4] A framework for understanding the positive and normative effects of these policy changes is necessary if we want to evaluate these proposals.

One particular aspect the problem that has not received much attention is the affect of the manpower procurement system on propensity of go to war. Rangel justified his call for draft reinstatement on the basis that "this President and this Administration would never have invaded Iraq, especially on the flimsy evidence that was presented to the Congress, if indeed we had a draft and members of Congress and the Administration thought that their kids from their communities would be placed in harm's way." All the work on the welfare effects of conscription policy holds fixed the extent of warfare (See Warner and Asch (2001) for an overview), but if the military recruitment policy itself affects the nation's propensity to go to war, it is important to take this effect into account. For example, if the volunteer military reduces the cost of fighting a given war, but raises the probability of fighting inefficient wars, the net welfare consequence might be ambiguous. This paper provides a framework for making such comparisons.

The proposition that the manpower procurement system might affect the propensity of a nation to fight has a long tradition dating at least to Kant (1795), who thought professional militaries were more likely to go to war. When considering the adoption of the All-Volunteer armed force in the U.S., the Gates commission discussed its effect on the propensity to fight, concluding "a decision to use the all-volunteer force will be made according to the same criteria as the decision to use a mixed force of conscripts and volunteers..."(Gates, 1970, p.155). The only formal treatment of the issue in the literature is Wagner (1972), who modeled the effect of taxation-in-kind on the size of the military and the propensity to go to war. In his model, conscripted armies are more likely to lead

[1] For a review of the U.S.'s recent history with various military manpower procurement systems, see Rostker (2006) and the helpful bibliography by Anderson and Bloom (1976).

[2] For an overview of the time-line of conscription in Europe, see Joenniemi, ed (2006).

[3] On CBS's *Face The Nation*, November 19, 2006.

[4] Britain - "Bring Back Conscription (even for me)" *The Independent* 02/01/07, South Africa- "Conscription May Return to Boost Army Numbers" *Independent Online* 09/18/00 , Australia "Conscription Calls Shot Down", *The Age* 05/19/03.

to war, since the costs are borne so heavily by a small number of people, while the median voter who drives policy is unlikely to be affected. Wagner's intuition remains in my model, but there is a countervailing force as the volunteer military increases support among those who are willing to pay for the war but are not willing to fight themselves (due to high opportunity costs). Although not primarily concerned with support for war, Perri (2008) discusses the distributional consequences of conscription in the context of the civil war; the differing distribution of the burden of fighting between the draft and volunteer militaries plays a central role in my explanation of the support differential between these two systems.

Empirical research has found mixed effects of conscription policy on a nation's propensity to go to war. Using cross-section analysis, White (1989) and Ross (1994) find that countries with conscription armies are more likely to go to war. Choi and James (2003) find similar results with panel data over the past century. Using a wider and shorter panel, however, Choi and James (2008) find that conscription is negatively associated with war onset and unrelated to militarized disputes.

In this paper, I propose an explanation for these mixed findings by demonstrating in a simple model that the effect of conscription on support for war is is not monotonic. Instituting the draft can either increase or decrease support, depending on how citizens are arrayed in the preference space. Citizens with small benefits from war are unwilling to pay for a volunteer military, but support the war under the draft, as long as they do not have to fight. In contrast, citizens with moderate benefits and costs are willing to pay a volunteer to go, but do not support the war if drafted. The relative size of these groups determines which system leads to more support. Informally, the volunteer military increases support for war (vis-a-vis even optimal conscription) if the "modal" benefit from war is high enough. Furthermore, pure conscription never leads to the highest possible support for war, if partial draft systems are available, since increasing the wage for volunteers from the draftee wage induces a second-order decline in support for tax reasons and a first-order increase for draft reasons.

These results also illuminate the welfare consequences of the two pure employment systems. From a utilitarian perspective, neither system is unambiguously better. For any given war, the volunteer system prosecutes the war more efficiently than does the draft, because it selects those soldiers with the lowest costs of fighting. But each system can lead to the undertaking of wars that are inefficient, from a total-welfare perspective, and that the other system avoids, and each system can fail to undertake efficient wars that the other system undertakes.

To further investigate these positive and normative consequences of military manpower procurement, I turn to a family of truncated normal preference distributions. For this family, much of the ambiguity falls away. Specifically, the draft leads to more support for war when the "average" level of support is relatively low, while the volunteer military leads to more support when it is relatively high. Furthermore, the draft leads to more support when war is inefficient, and the volunteer military leads to more support when war is efficient. Finally, we should expect the draft to lead to more war in political systems with relatively low support requirements for war, and the volunteer military to lead to more war in political systems with relatively high support requirements.

The next section outlines the baseline model and presents results on support for three pure manpower procurement systems: volunteer, a simple draft, and an optimal draft. Section 3 extends the analysis to partial draft systems, in which some fraction of the military is induced to volunteer. Section 4 turns to the question of welfare, characterizes efficiency in this setting, and analyzes the various systems from a total-welfare perspective. Section 5 considers a number of extensions to the baseline model, including selective service and system-specific costs. Section 6 briefly concludes.

2 Basic Model with Preferences in Two Dimensions

This section presents a model of support for war under various military manpower procurement systems. First, I outline the players and preferences, which are common across all the manpower procurement systems. Then, for each manpower procurement system, I outline the timing and the equilibrium actions and level of support for war. Finally, I compare the level of support induced by these systems, both for general preference distributions and a family of truncated normal distributions. Throughout, the extant manpower procurement system is taken as given exogenously.[5]

2.1 Preferences, Voting, and War

Take a country composed of a unit mass of risk-neutral citizens, where citizens are indexed by i. Consider a war that requires the participation of a fraction d of the citizens. This requirement is a simplification in at least two ways. First, citizens are equally able to participate in the military, while the reality of military recruitment suggests the importance of differential ability. I return to this issue briefly in an extension in section 5. Second, there is a fixed and known manpower requirement, and there are no returns to having a larger military than the minimum. Since the primary concern of this paper is on the interaction of manpower procurement systems and support for war, I abstract away from these other important effects of military structure.

Assume, further, that each citizen has three inputs into his utility function. First, if the country goes to war, he receives a private expected benefit $b_i \in \mathbb{R}$, regardless of whether he personally fights. This expected benefit is net of all costs of war other than those determined by the manpower procurement system and includes an evaluation of the probability of various degrees of success and failure together with the payoff under each outcome. It is also net of the tax cost of providing for draftees.[6] Second, if the citizen personally fights in the war, he pays a cost $-c_i \in \mathbb{R}^-$. Similar to the benefit, this cost includes an evaluation of the probabilities and payoffs of all potential outcomes of fighting, evaluated with respect to the citizen's best outside option, taking into account whatever minimal wage a draftee would receive.[7] These costs/benefits are distributed across the population according to some pdf $f(b, c)$, which I assume to be positive everywhere in the domain, with marginal distributions $f_b(b)$ and $f_c(c)$. Each of these costs/benefits is measured in dollar terms, and the final input in each citizen's utility consists of the net money transfer to/from the government and other citizens. This could include a wage, taxes, and any payment received as a draft proxy.

[5] For a positive analysis of the choice of military manpower procurement systems, see Tollison (1970), Mulligan and Shleifer (2005), and Hadass (2004), although none of these consider the effect of that choice on propensity to go to war.

[6] It is an open question whether citizens can properly evaluate their personal benefit of big policy changes like the decision to go to war. Berinsky (2009), for example, argues that citizens' perceptions of the benefits of war are importantly shaped by the society's elite. I leave aside the question of the origins of these preferences, and assume that the b_is in the model reflect the final net result of whatever process leads citizens to make judgments about the benefits of war.

[7] The assumption that everyone has a cost of going to war is for simplicity. Allowing for those who enjoy war per-se, relative to their next best option, doesn't change any of the results, but merely introduces more regions to analyze.

The moves and timing under each manpower procurement system are slightly different, but they follow the same general pattern. Military/civilian status is first determined, and then each citizen decides whether or not to support the war. The war is pursued if it is supported by a large enough fraction of the citizens, $T \in [0, 1]$.[8] Limiting attention to weakly undominated strategies, which here amounts to sincere voting and choosing to volunteer or not as if the country were going to war for sure, yields a unique Nash equilibrium for each manpower procurement system.

Definition 1. *A* **war** *consists of a continuous preference distribution $f(b, c)$, a number $d \in [0, 1]$ representing the fraction of the population required to prosecute the war, and a voting threshold $T \in [0, 1]$ of support necessary to prosecute the war.*

2.2 Pure Manpower Procurement Systems

In this section, I derive the economic and political equilibrium under three pure manpower procurement systems: volunteer, simple draft, and optimal draft.

Volunteer: Under a volunteer military, the military wage w is set such that a fraction d of the citizens volunteer. If a citizen volunteers for the military and the country goes to war, he receives w, financed by a lump-sum tax shared equally among all citizens. For simplicity, I ignore the deadweight loss associated with taxation by assuming they are lump-sum. Tax inefficiency is reintroduced in the extensions below. If the country does not go to war, he receives no wage and pays no cost (for payoff of 0). Furthermore, each citizen decides whether or not to support the war, and the country goes to war if the fraction of citizens supporting the war exceeds the threshold T. Table 1 summarizes the payoffs to volunteers and civilians under war and peace.

Table 1: Payoffs for Soldiers and Civilians under Volunteer

War	Soldier	Civilian
YES	$b_i - c_i + w(1 - d)$	$b_i - dw$
NO	0	0

Definition 2. *An equilibrium in weakly undominated strategies in a volunteer system consists of a wage w^*, an employment choice function $e(b, c) \to \{0, 1\}$, and a voting function $v(b, c) \to \{0, 1\}$, such that:*

a) $\int \int e(b, c) f(b, c) = d$

b) $e(b, c) = 1 \iff b - c + w(1 - d) \geq b - dw$

c) $v(b, c) = 1 \iff \max\{b - c + w(1 - d), b - dw\} \geq 0$

In words, an equilibrium consists of a wage that induces exactly the necessary fraction of the citizens to volunteer, together with optimizing employment choices and votes by the citizens. Weakly

[8] The idea that policy (especially foreign policy) is affected by public support is central to most economic analysis of politics, but this idea is not uncontroversial in the political science literature. For an overview of the dispute and relevant evidence, see Aldrich et al. (2006).

undominated strategies require each citizen to act as if his vote were decisive and choose employment as if war were a foregone conclusion.

Remark 1. *For any war, there is a unique equilibrium in weakly undominated strategies in a volunteer system. This equilibrium consists of:*

a) $d = F_c(w^*)$

b) $e(b,c) = 1 \iff (b,c) \in A \cup C \cup D \cup G \cup H \cup J$ *(from Figure 1.)*

c) $v(b,c) = 1 \iff (b,c) \in A \cup B \cup C \cup D \cup E \cup F$ *(from Figure 1.)*

Since weakly dominated strategies are eliminated, a citizen volunteers if $c_i \leq w$. In Figure 1, every citizen to the left of the vertical dashed line w volunteers to fight. Soldiers vote to go to war if $w(1-d) + b_i - c_i \geq 0$. Some soldiers volunteer, but vote against going to war. This occurs for two reasons. The most obvious, depicted in regions G and J of Figure 1, are people with relatively low costs of fighting, per-se, but who bear a heavy cost of the nation going to war ($b_i < 0$). A little less intuitive are those in Region H, who get a mild benefit of going to war, but who just barely prefer fighting to staying home (c_i just less than w). Once they take into account the costs of paying the other soldiers (dw), they prefer to just forgo the war completely. All other volunteers vote to go to war. Of particular interest are the green regions in Figure 1 (C,D). These volunteers vote to go to war, because they are compensated for fighting. If they were a one-man country, and had to individually bear the costs and the benefits, they would choose not to fight. In contrast, those in region A would fight a one-man war even with no wage (So would some of those in B, but given their high cost of fighting, they don't volunteer here).

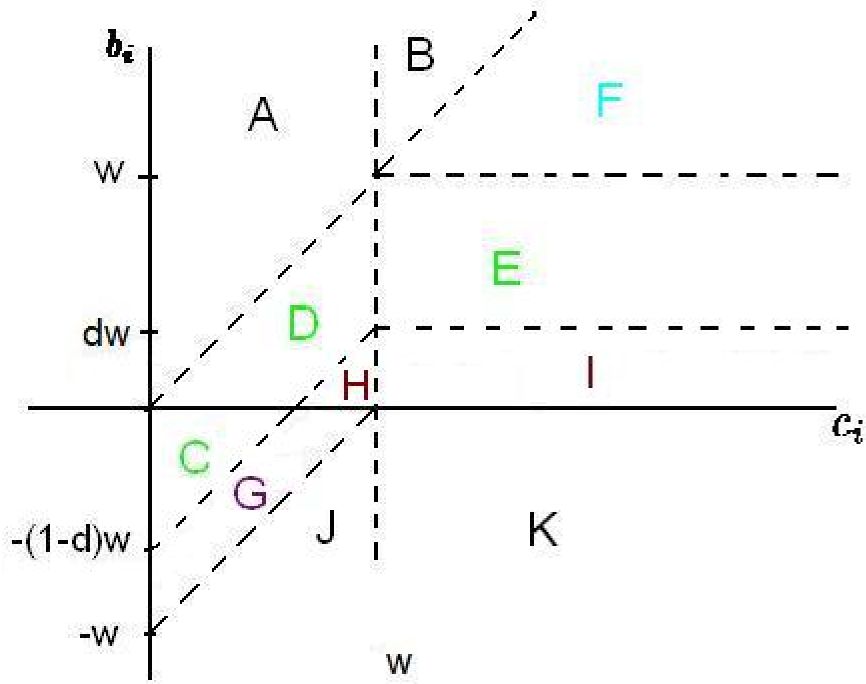
In the volunteer military, the civilians consist of all the citizens to the right of the vertical dashed line at $c_i = w$. Just like the military, they are not homogeneous in their support for the war. A civilian supports the war if $b_i - dw \geq 0$. Those citizens in regions B, E, and F vote in favor of the war, while those in regions I and K vote against it. The citizens in B support the war because they get such a large benefit; in fact, they would be willing to go fight themselves, if they had to. The citizens in E and F support the war because they do not have to fight themselves, but given the reduced costs due to specialization, they are willing to pay the wage of the soldiers. The citizens in I do not get a large enough benefit from the war for the wage costs to be worth it, while those in K do not benefit from the war at all.

To summarize, under the volunteer system, everyone with $c_i \leq w$ volunteers, and all these volunteers support the war except those in regions G, H, and J. Those with $c_i > w$ remain civilians, and all the civilians support the war except those in regions I and K.

Simple Draft Under the simple draft system, by contrast, no one volunteers, and a fraction d of citizens are randomly assigned to the military and receive a wage normalized to zero.[9] Let $s_i \in \{0,1\}$ represent citizen i's draft status, where $s = 1$ represents being drafted. Here, for simplicity, everyone is equally subject to the draft. I consider selective service in an extension below. Once assigned their draft status, they vote for or against the war. It may seem odd that the citizens decide whether or

[9]The draftee wage is normalized to zero in the sense that I've assumed $c_i \geq 0$ for everyone, and the cost of paying draftees is swept into the b terms. If the draftee wage was set above the lowest c_i, but below the volunteer wage, then we would be in what I call a partial draft system. I analyze that case in the next section.

Figure 1: Citizens' Preferences and Key Cutoffs



not they support the war after they know whether or not their draft number has come up. There are two responses to this concern. First, you can think of this as an equilibrium model, so the decision to go to war or stay home anticipates the equilibrium level of support. Policymakers may not know exactly which people will support the war and which won't, but they know what fraction of each group support it. Alternatively, the current model can be reinterpreted fairly easily as an ex-ante decision. Instead of thinking of being selected as literally having your draft number drawn, think of it, instead, as the probability that the citizen is of draft-eligible age when the war is announced and the draft begins. Then the model represents an extreme approximation of the actual draft in which all draft-eligible people are selected.

Definition 3. *An equilibrium in weakly undominated strategies in a simple draft system consists of a voting function* $v(b, c|s) \to \{0, 1\}$*, such that:*

a) $v(b, c|s = 1) = 1 \iff b \geq c$

b) $v(b, c|s = 0) = 1 \iff b \geq 0$

In words, an equilibrium requires that both draftees and non-draftees have to vote to maximize their utility, as if their vote were decisive.

Remark 2. *For any war, there is a unique equilibrium in weakly undominated strategies in the simple draft system. This equilibrium consists of:*

a) The fraction d of citizens with $s = 1$ chooses $v(b, c|s = 1) = 1 \iff (b, c) \in A \cup B$ (from Figure 1.)

b) The fraction $1 - d$ of citizens with $s = 0$ chooses $v(b, c|s = 0)) = 1 \iff (b, c) \in A \cup B \cup D \cup E \cup F \cup H \cup I$ (from Figure 1.)

Again, consider soldiers and civilians separately. Soldiers make up a fraction d of the citizens in each region of Figure 1. Since they receive no wage, they support the war if and only if $b_i - c_i \geq 0$, i.e., they are above the 45-degree dashed line through the origin. As discussed above, only the citizens in regions A and B meet this criterion. Since there is no wage to pay, and he doesn't have to fight, a civilian supports the war if $b_i \geq 0$. In terms of Figure 1, civilians make up a fraction $1 - d$ of every region, and they support the war if they are in a region above the horizontal solid line (Regions A, B, D, E, F, H, and I).

To summarize, under the draft, a fraction d of citizens in every region is assigned to the military. All the citizens in regions A and B support the war, while the fraction $1 - d$ of those in D, E, F, H, and I who were not drafted do so as well.

Optimal Draft In the spirit of Mulligan (2008), I also consider an optimal draft, in which a fraction d of the citizens is randomly assigned draftee status ($s_i = 1$), but can avoid serving for a price. Here, assume that instead of going themselves they could hire a proxy to go in their place at the market price. Perri (2009) shows that this mechanism is equivalent to Mulligan's if there are no transaction costs of hiring a proxy and Mulligan's commutation price is equal to the market price for proxies. After draftee status is assigned, a market arises for draft proxies, and the market price m is determined so that exactly d citizens are willing and able to serve at that price. Draftees who prefer not to serve must pay the proxy price, while non-draftees who want to serve receive it. As before, citizens know their draft status before deciding whether to support the war. Table 2 illustrates the payoffs to soldiers and civilians according to draft status and war prosecution.

Table 2: Payoffs for Soldiers and Civilians by Draft Status under Optimal draft

	Draftee		Non-Draftee	
War	Soldier	Civilian	Soldier	Civilian
YES	$b_i - c_i$	$b_i - m$	$b_i - c_i + m$	b_i
NO	0	0	0	0

Definition 4. *An equilibrium in weakly undominated strategies in an optimal draft system consists of a proxy price m^*, an employment choice function $e(b, c) \to \{0, 1\}$, and a voting function $v(b, c|s) \to \{0, 1\}$, such that:*

a) $\int \int e(b, c) f(b, c) = d$

b) $e(b, c) = 1 \iff m^* \geq c$

c) $v(b, c|s = 1) = 1 \iff \max\{b - c, b - m\} \geq 0$

d) $v(b, c|s = 0) = 1 \iff \max\{b + m - c, b\} \geq 0$

In words, an equilibrium consists of a proxy price that induces exactly the necessary fraction of the citizens to volunteer, together with optimizing employment choices and votes by the citizens. Weakly undominated strategies requires each citizen to act as if his vote were decisive and choose employment as if war were a foregone conclusion.

Remark 3. *For any war, there is a unique equilibrium in weakly undominated strategies in the optimal draft system. This equilibrium consists of:*

a) $d = F_c(m^*)$*, so* $m^* = w^*$.

b) $e(b,c) = 1 \iff (b,c) \in A \cup C \cup D \cup G \cup H \cup J$ *(from Figure 1.)*

c) The fraction d *of citizens with* $s = 1$ *choose* $v(b,c|s=1) = 1 \iff (b,c) \in A \cup B \cup F$ *(from Figure 1.)*

d) The fraction $1-d$ *of citizens with* $s = 0$ *choose* $v(b,c|s=0) = 1 \iff (b,c) \in A \cup B \cup C \cup D \cup E \cup F \cup G \cup H \cup I$ *(from figure 1.)*

Under the optimal draft , a fraction d of citizens are randomly assigned draftee status, and a proxy price (m) arises. By the same argument as in the volunteer section, the price which equates supply and demand is $m^* = w^*$. Again, consider soldiers and civilians separately, but also consider initial draftee status. First consider soldiers, who consist of all those with $c_i \leq m^*$ (w^* in Figure 1). Draftee soldiers make up a fraction d of all soldiers, and they receive no wage, so they support the war if and only if $b_i - c_i \geq 0$, i.e., they are above the 45-degree dashed line through the origin. Only the citizens in region A meet this criterion. Non-draftee soldiers make up a fraction $(1-d)$ of all soldiers, and they receive the proxy price m^* if they go to war, so they support the war if and only if $b_i + m^* - c_i \geq 0$. Non-draftee soldiers support the war unless they are in region J.

A civilian's support for war also depends on his draftee status. Draftees make up a fraction d of civilians, and they have to pay a proxy if the nation goes to war, so they support war if and only if $b_i - m^* \geq 0$. Citizens in region B and F meet this criterion. Non-draftees make up a fraction $(1-d)$ of civilians, and they bear no costs of war, so they support it if and only if $b_i \geq 0$. Citizens in regions B,E, F, and I meet this criterion.

In summary under the optimal draft, the proxy price equilibrate at $m^* = w^*$ and everyone with $c_i \leq m^*$ serves in the military. Everyone in regions A, B, and F supports the war, while only the non-draftee fraction $(1-d)$ of people in regions C,D,E,G,H, and I support the war, and no one in regions J or K does.

2.3 Comparison of Support in Pure Manpower Procurement Systems

Which system leads to more support for war depends on the distribution of the citizens' preferences $f(b,c)$. More specifically, it depends on the way they are allocated among the regions in Figure 1. But, there are a number of regions for which the level of support is the same under all personnel policies, so they play no role in the comparison. Specifically, every citizen in regions A and B supports the war under all policies, while no citizen in regions J or K does, so a comparison must turn on the other regions.

Take some war. Let S_V represent the proportion of voters who support the war under a volunteer system, S_D the proportion under a simple draft, and S_O the proportion under an optimal draft. The analysis of the individual systems indicates that

$$S_V - S_D = d(C + D + E + F) - (1 - d)(H + I), \tag{1}$$

$$S_V - S_O = d(C + D + E) - (1 - d)(G + H + I), \text{ and} \tag{2}$$

$$S_O - S_D = dF + (1 - d)G, \tag{3}$$

where the capital letters represent the proportion of the population in each region of Figure 1. Any comparison of the level of support for war under the various personnel systems must depend directly on these differences. First compare the optimal draft to the simple draft, then compare the optimal draft to the volunteer system, and finally use these two sets of results to compare the simple draft to the volunteer system.

Simple versus Optimal Draft For any war, an optimal draft leads to more support for war than a simple draft. This difference turns on two sorts of citizens: non-draftees with low costs and low benefits (region G) who support war if they receive a proxy payment, and draftees with high costs and high benefits (region F) who support war if they can hire a replacement to fight for them.

Volunteer versus Optimal Draft The relative support for war under a volunteer system versus an optimal draft is theoretically ambiguous. In general, either system can lead to more support for war, but the optimal draft is more likely to do so when there are many citizens with relatively weak benefits of going to war (G,H,and I), and the volunteer system is more likely to do so when there are many citizens with relatively strong benefits of going to war (C,D, and E). The intuition is that citizens with small benefits of war are not willing to pay the tax cost of a volunteer military, but support the war if they are not, themselves, drafted to fight. By contrast, citizens with a moderately large benefit of war are willing to pay the tax cost, but not the large idiosyncratic costs of fighting themselves if drafted. This result suggests why prior attempts to find a simple monotonic relationship between military employment systems and war-going have had such limited success.

More formally, let $F(b|c)$ represent the conditional distribution of benefits, for some cost of going to war and $\Delta S(c)$ be the relative support for war under the volunteer military versus the optimal draft among citizens with cost $c_i = c$. Then

$$\Delta S(c) = \begin{cases} d[F(c|c) - F(c - (1-d)w|c)] - (1-d)[F(c - (1-d)w|c) - F(c - w|c)], & \text{if } c < w \\ d[F(w|c) - F(dw|c)] - (1-d)[F(dw|c) - F(0|c)], & \text{otherwise.} \end{cases}$$

For civilians ($c > w$), this expression is especially simple. Collecting terms,

$$\Delta S(c) = dF(w|c) + (1 - d)F(0|c) - F(dw|c).$$

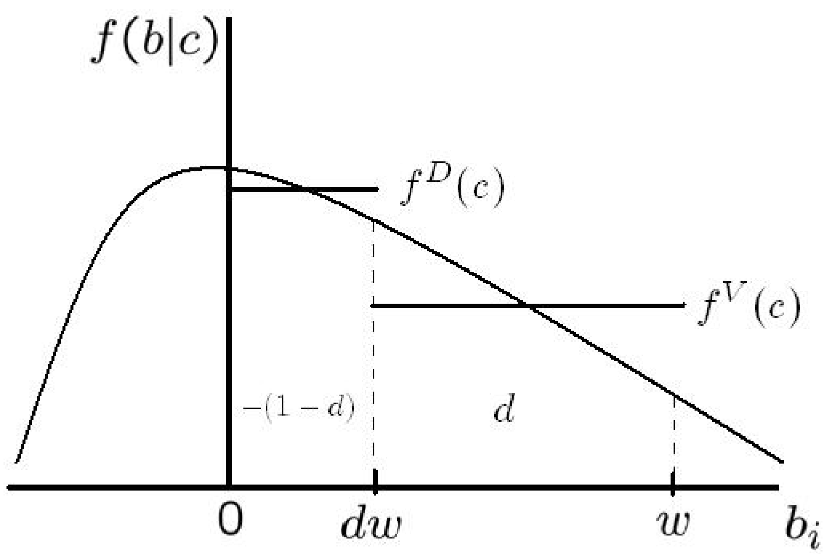
The comparison of support turns on how citizens are divided between the draft-advantaged region (I) and the volunteer-advantaged region (E). More specifically, let $f^V(c)$ represent the average conditional density in the volunteer-advantaged region (i.e.,$f^V(c) = \frac{F(w|c) - F(dw|c)}{w - dw}$), and $f^D(c)$ represent the average conditional density in the draft-advantaged region ($f^D(c) = \frac{F(dw|c)-F(0|c)}{dw}$). Then we can write

$$\Delta S(c) = dw(1-d)[f^V(c) - f^D(c)].$$

Figure 2 illustrates this comparison, where the horizontal lines represent the average density in each region, and d and $-(1-d)$ are the degree of volunteer advantage in the volunteer-advantaged region (E) and draft-advantaged regions (I), respectively.

If the benefits were uniformly distributed between 0 and w, so $f^D = f^V$, support is identical under both systems. If the average density is higher in the draft-advantaged region, as in Figure 2, the draft leads to more support for war (and vice-versa). The "size" of these two regions plays no important role. If d increases, the "size" of the draft-advantaged region grows, but that growth is perfectly balanced by a decrease in the degree of advantage in the draft-advantaged region and an increase in the degree of advantage in the volunteer-advantaged region, as more people are subject to the draft. A sufficient condition for evaluating relative support is convexity or concavity of $F(b|c)$

Figure 2: Volunteer Advantage and Average Densities by Region, for $c > w$



on $b \in [0, w]$. $F(b|c)$ in convex (concave) on this range if and only if $f(b|c)$ is increasing (decreasing) on it, which guarantees that the volunteer (optimal draft) system leads to more support.

A similar support comparison holds for soldiers ($c < w$), where

$$\Delta S(c) = dF(c|c) + (1-d)F(c-w|c) - F(c-(1-d)w|c).$$

Define $f^V(c) = \frac{F(c|c)-F(c-(1-d)w|c)}{(1-d)w}$ and $f^D(c) = \frac{F(c-(1-d)w|c)-F(c-w|c)}{dw}$, similar to above, as the average densities in the volunteer-advantaged region and draft-advantaged region. Once again, $\Delta S(c) = dw(1-d)[f^V(c) - f^D(c)]$, and so the volunteer support advantage among soldiers again turns on the relative average densities. Again, convexity or concavity of $F(b|c)$ on $b \in [c-w, c]$ is a sufficient condition for analyzing the support differential. $F(b|c)$ is convex (concave) on this range if and only if $f(b|c)$ is increasing (decreasing) on it, which guarantees that the volunteer (optimal draft) system leads to more support.

Adding a little structure to the distribution of preferences reveals an even cleaner characterization.

Lemma 1. *For a given cost of going to war c, $\Delta S(c) \geq 0$ if and only if $f^V(c) \geq f^D(c)$. If we further assume the conditional distribution of benefits $f(b|c)$ is single-peaked, and let $b^*(c)$ represent the benefit with the greatest density, then $\Delta S(c) \geq 0$ if $b^*(c) \geq \min\{c, w\}$ and $\Delta S(c) \leq 0$ if $b^*(c) \leq \min\{c-w, 0\}$.*

From Lemma 1, when distribution of benefits from war is unimodal, the sign of relative support can often be determined simply by knowing the location of the modal benefit. The density must decline as the benefit moves away from the modal benefit, and, for a given cost, the region in which more people support war under the optimal draft is always below the region where more people support the war under the volunteer military. If the modal benefit is relatively high, the volunteer military leads to more support, since the density must decline even further as it enters the draft-advantaged region. If it is relatively low, the draft leads to more support, since the density must decline as the benefit increases into the volunteer-advantaged region.

Finally, note the unimportance of the conditional mean or median benefit for a comparison of support. Except in the case of symmetric distributions, a long tail could put the mean and median nearly anywhere. But when comparing support under these two systems, all that matters is whether the density is increasing or decreasing through the swing regions, and that comparison is completely governed by the mode.

So far, the analysis of relative support has been for a given cost, c. But, of course, integrating up leads directly to the following proposition.

Proposition 1. *Define $f^V(c)$ and $f^D(c)$ as in Lemma 1. Then $S_V - S_O \geq 0$ if and only if $\int_0^\infty (f^V(c) - f^D(c)) f_c(c) dc \geq 0$.*

Furthermore if $f(b|c)$ is single-peaked at $b^*(c)$, then

a) If $b^*(c) \leq \min\{c-w, 0\}$ for all c, then the optimal draft leads to at least as much support for war as the volunteer military.

b) If $b^*(c) \geq \min\{c, w\}$ for all c, then the volunteer military leads to at least as much support for war as the optimal draft (and therefore, as the simple draft).

Proposition 1 extends the analysis from Lemma 1 into the second dimension. It establishes that if the "ridge" of modal benefits is above some cutoff, the volunteer system leads to more support, while if it is below some cutoff, the optimal draft system does. If the modal benefits are above the cutoff for some costs, and below for other costs, little can be said in general, since there are pressures in each direction. There are groups in society for which the draft leads to more support and some groups for which the volunteer military leads to more support, and the total level of support depends on both their sizes and how strong their differential support is.

Combining the results from the last two comparisons bounds the relationship between the simple draft and volunteer military, although the results are not as clean as the optimal draft versus volunteer comparison. Certainly, if the volunteer system leads to more support than the optimal draft, it leads to more support than the simple draft. Any further analysis turns crucially on the distribution of costs ($f_c(c)$), since the support under a simple draft is nearly identical to that of the optimal draft for costs near $c = w$, but the simple draft is increasingly disadvantaged for costs further away (as regions F and G become more important).

2.4 Example with Truncated Bivariate Normal

To illustrate the effects outlined in Proposition 1, assume $f(b, c)$ is bivariate normal, with mean/mode parameters μ_c and μ_b and variance parameters $\sigma_c = \sigma_b = 1$, but truncated below at $c = 0$. Assume, further, that b and c are uncorrelated. Figure 3 represents the difference in support between the volunteer manpower procurement system and the optimal draft, as a function of the modal benefit (μ_b) and cost (μ_c) parameters.[10] The grey area represents parameter configurations for which the level of support under the volunteer military and optimal draft is within 1 percentage point. The cool colors on the bottom half represent parameter combinations for which the draft leads to more support, while the hot colors at the top represent combinations where the volunteer military leads to more support than the optimal draft.

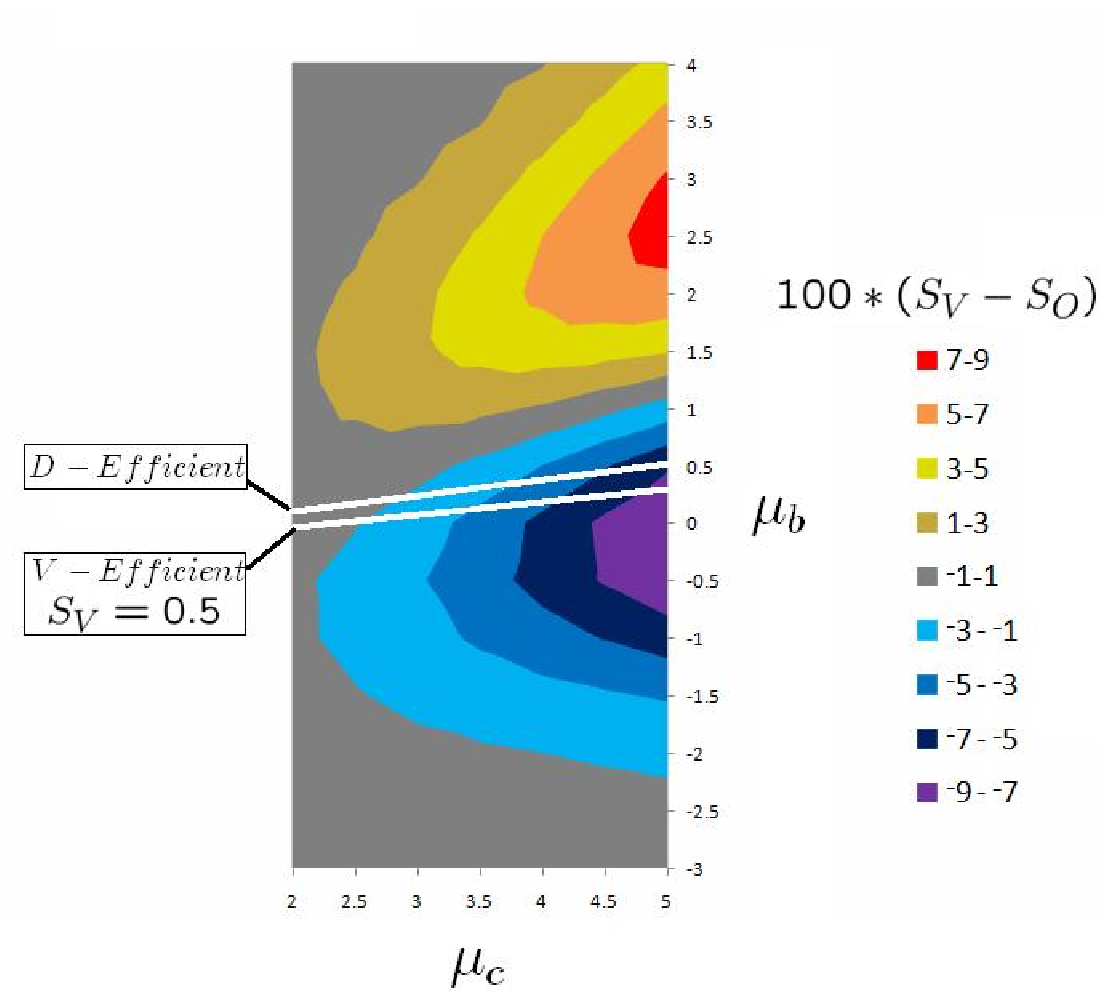
When the average cost of going to war is small, the equilibrium wage/proxy payment is small, so the swing region made up of areas C+D+E and G+H+I is also small. Intuitively, when the cost of going to war is small, bearing a portion of that cost (as under the volunteer system) and bearing the whole cost (as under the draft) are not that different, so there are not large differences in support under the two systems.

As μ_C grows, the system used begins to affect support for war more significantly. The draft leads to greater support when the modal benefit is small, while the volunteer military leads to greater support when the "modal" benefit is large. For symmetric distributions like the normal, this means that the draft leads to more support when the populace is nearly evenly divided, while the volunteer military leads to more support when the populace overwhelmingly supports the war. For illustration, Figure 4 presents the support for war under all three systems for various modal benefits, when $\mu_c = 4.5$.

The upshot of this difference is that if the threshold support to trigger war (T) is small, marginal wars are be prosecuted under the draft, but not prosecuted under the volunteer system. While if the threshold support to trigger war is large, the opposite relation holds. One implication of this fact is that political systems which require sub-majority support to prosecute a war (such as, perhaps, a dictatorship or oligarchy) should exhibit a positive relationship between conscription and war prosecution, while political systems which require super-majorities should exhibit a negative relationship between conscription and war.

[10] The cost parameter is no longer the mean, once the distribution has been truncated, but it remains the mode, so I refer to both as such.

Figure 3: Volunteer Support Advantage, as a Function of Modal Cost and Benefit, when $\rho = 0$, $d = .1$, and $\sigma_c = \sigma_b = 1$



3 Partial Draft

In reality, pure draft systems are relatively rare. When they exist, they are generally more along the lines of universal service requirements (as in Switzerland or Israel, for example). In most cases, the volunteer system and the draft system exist simultaneously. This section analyzes these partial draft systems.

Under a partial draft system, a wage $w' \leq w$ is set by the government and financed by taxation of all citizens, which leads a fraction $d' \leq d$ of the citizens to volunteer. All citizens who do not volunteer are subject to a draft to fulfill the remaining need, so any non-volunteer is drafted with probability $\frac{d-d'}{1-d'}$. Table 3 presents the payoffs to volunteers, draftees, and civilians by the war status.

Consider the decision of a citizen with cost c_i of going to war, facing a wage w', and who expects a fraction $d' < d$ of his fellow citizens to volunteer. If he volunteers, he receives a payoff of $w' - c_i$,

Figure 4: Support for War under Various Manpower Procurement Systems, as a Function of Modal Benefit, when $\mu_c = 4.5$, $\rho = 0$, $d = .1$, and $\sigma_c = \sigma_c = 1$

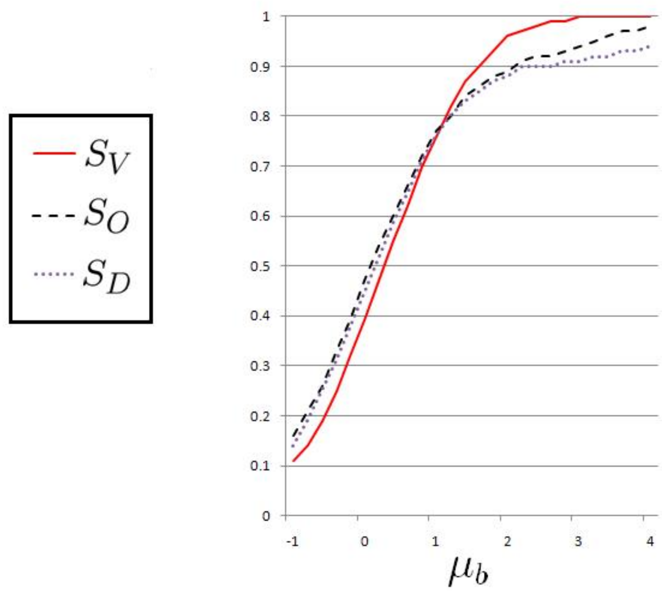


Table 3: Payoffs for Volunteers, Draftees, and Civilians by War Prosecution

War	Volunteer	Draftee	Civilian
YES	$w'(1-d') + b_i - c_i$	$b_i - c_i - d'w'$	$b_i - d'w'$
NO	0	0	0

while if he does not volunteer, he is be drafted with probability $\frac{d-d'}{1-d'}$ and have to fight for no wage. So the citizen volunteers if

$$w' \geq c_i \frac{1-d}{1-d'}.$$

Aggregating these individual decisions, $d' = F_c(\frac{1-d'}{1-d} w')$.

Definition 5. *An equilibrium in weakly undominated strategies in a partial draft system drafting a fraction $d - d'$ consists of a wage w', an employment choice function $e(b, c) \rightarrow \{0, 1\}$, and a voting function $v(b, c|s, e) \rightarrow \{0, 1\}$, such that:*

a) $\int \int e(b, c) f(b, c) = d'$

b) $e(b, c) = 1 \iff w' - c \geq -\frac{d-d'}{1-d'} c$

c) $v(b, c|e = 1) = 1 \iff b - c + (1 - d')w' \geq 0$

d) $v(b, c|e = 0, s = 0) = 1 \iff b - d'w' \geq 0$

e) $v(b, c|e = 0, s = 1) = 1 \iff b - c - d'w' \geq 0$

In words, an equilibrium with a partial draft consists of a wage w' that induces a fraction d' of the citizens to volunteer, together with optimizing employment choices by all citizens, and optimizing votes by civilians, volunteers, and draftees. Weakly undominated strategies require each citizen to act as if his vote were decisive and choose employment as if war were a foregone conclusion.

Remark 4. *For any war, there is a unique equilibrium in weakly undominated strategies in the partial draft system. This equilibrium consists of:*

a) *w' such that $d' = F_c(w' \frac{1-d'}{1-d})$*

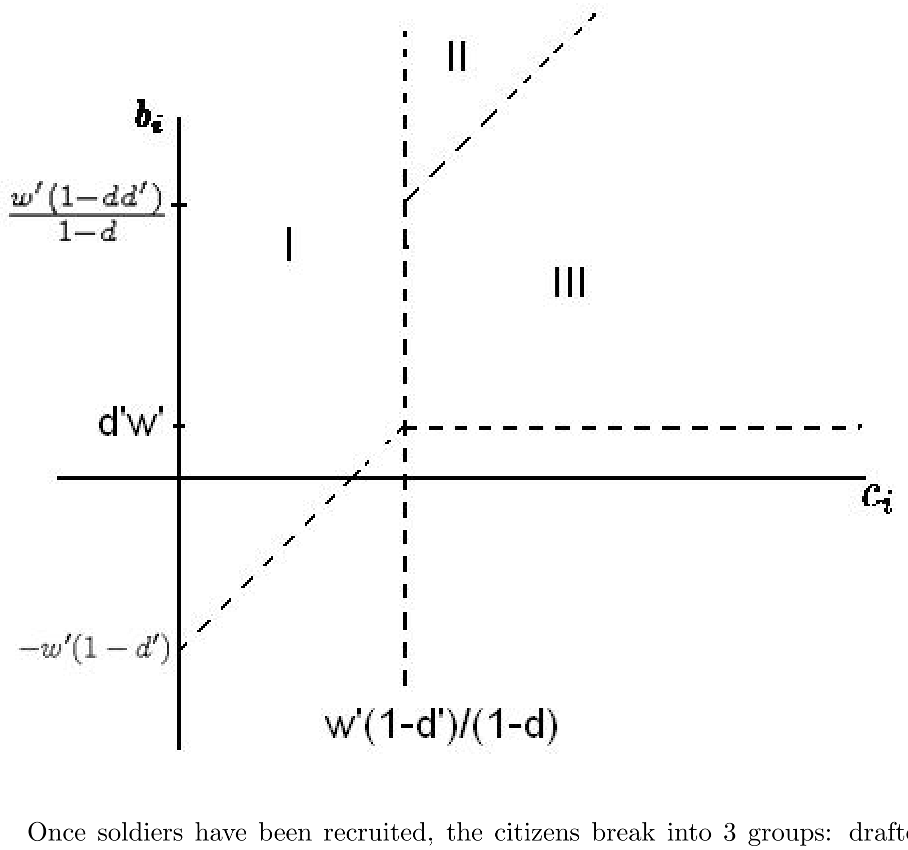
b) *$e(b, c) = 1 \iff c \leq w' \frac{1-d'}{1-d}$*

c) *$v(b, c) = 1$ for all citizens in regions I and II(from Figure 5).*

d) *The fraction $\frac{d-d'}{1-d'}$ of citizens in III with $s = 0$ set $v(b, c|s = 0) = 1$ (from Figure 5.)*

e) *The fraction $\frac{1-d'}{1-d'}$ of citizens in III with $s = 1$ set $v(b, c|s = 1) = 0$ (from Figure 5.)*

Figure 5: Support Cutoffs under Partial Draft Systems



Once soldiers have been recruited, the citizens break into 3 groups: draftees, volunteers, and civilians. The volunteers, those to the left of the vertical dashed line at $w'(1-d')/(1-d)$ in Figure 5, support the war if $w'(1-d')+b_i-c_i \geq 0$. Only those soldiers in region I fit this criterion. Draftees support the war if $b_i - c_i - w'd' \geq 0$: those in region II. Civilians support the war if $b_i - w'd' \geq 0$, regions II and III. The total support for war when a fraction d are needed for war, and a fraction d' are induced to volunteer is given by

$$S(d'|d) = I + II + \frac{1-d}{1-d'}III.$$

Proposition 2. *Given any war, consider a partial draft system. Let $S(d'|d)$ represent the support for war in a partial draft system as a function of the fraction $d' \leq d$ induced to volunteer, while the remaining $d - d'$ is drafted randomly from non-volunteers. Then $S'(0|d) > 0$, so a pure draft system is never support-maximizing. Furthermore $S'(d|d) \geq 0$ if and only if*

$$(1-d)\int_0^w f(c-w+dw,c)dc - (d + \frac{wf_c(w)}{1-d})\int_w^\infty f(dw,c) \geq 0.$$

Proof. See Appendix. □

Proposition 2 characterizes the conditions under which the simple draft and the volunteer military are support-maximizing. A simple draft is *never* support-maximizing. Intuitively, starting from a simple draft, increasing the wage slightly from zero causes a second-order drop in support due to tax costs (since the total wage bill is $d'w'$ and both are zero), but a first-order increase in support due to a decrease in forced enlistments (a change is support of $d'III$, where III is the population in the region III of Figure 5, where draftees oppose the war and non-draftees support it).[11]

A pure volunteer system, by contrast, may be support-maximizing, depending on the distribution of preferences. One easy way to interpret the condition is to linearly approximate the integral $\int_0^w f(c-w+wd,c)dc$ as αd and the integral $\int_w^\infty f(dw,c)dc$ as $\beta - \alpha d$.[12] α represents the density of preferences near the line at the bottom of region I in Figure 5, so it represents the "number" of volunteers who are just indifferent between supporting the war and not. Similarly β represents the density of preferences near the line at the bottom of region III in figure 5, so it represents the "number" of civilians who are just indifferent between supporting the war and not. Then

$$\begin{aligned} S'(d|d) &\approx (1-d)\alpha d - \Big(\frac{wf_c(w)}{1-d} + d\Big)\Big(\beta - \alpha d\Big) \\ &= (\alpha - \beta)\Big[d + \frac{wf_c(w)}{1-d}\Big] - \alpha w f_c(w) \end{aligned} \tag{4}$$

All else equal, the pure volunteer military is more likely to be support-maximizing when the following circumstances occur:

- There are a lot of soldiers who are lukewarm supporters (α high), because a cut in their pay turns them against the war.

- There are *not* a lot of lukewarm civilian supporters (β low), because a decrease in the tax cost of the war does not bring many more people to support the war.

[11] Note that this is true even if draftees are paid some wage, since the change in overall payments is still second-order.
[12] To justify this approximation, take linear Taylor approximations around $d = 0$. This yields the above functions with $\alpha = f(0,0)/f_c(0)$ and $\beta = f_b(0)$.

Further, these first two requirements are strict: if $\beta > \alpha$, then a pure volunteer system cannot be support-maximizing for any parameter configuration. So the other statics are interesting only when $\alpha > \beta$. Further, assume that $\beta > d\alpha$, so our linear approximation for fraction of lukewarm non-volunteers doesn't go negative. Given these restrictions, the pure volunteer system is more likely to be support-maximizing when:

- The war is large (large d). This result, however, depends crucially on the all-else-equal requirement, specifically on holding w fixed.
- The marginal volunteer has relatively small idiosyncratic costs of fighting ($w \equiv F_c(d)$ small), since the tax burden is small.
- The elasticity of supply for additional volunteers is fairly low ($f_c(w)$ small), since the push to full-volunteer status requires a large wage increase, increasing support among infra-marginal soldiers who are marginal with respect to support for war.

Another interesting static, but one which requires a more nuanced analysis, is to look at the effect on the support-maximization of the all-volunteer force as the size of the war increases, taking into account the effects on equilibrium wages. Since equilibrium wages are given by $d = F_c(w)$, locally, $dw/dd = 1/f_c(w)$. An incremental increase in d changes (4) by $K[(\alpha-\beta)(1-d+wf_c(w))-(1-d)^2\beta]$, where K is a positive constant. Increasing the size of the conflict increases the likelihood that the all-volunteer military is support-maximizing if

$$\beta < \Big(\frac{1-d+wf_c(w)}{1-d+wf_c(w)+(1-d)^2}\Big)\alpha.$$

So the impact of increasing the size of a war on the support-maximization of the all-volunteer system is driven by many of the same factors that affect the support-maximization itself. Increasing the size of the war increases $S'(d|d)$ if β is small, relative to α, so there are many lukewarm soldiers and few lukewarm civilians. As before, the requirement that $\beta < \alpha$ is strict, and it becomes even tighter if the war or equilibrium wage is small.

4 Welfare Comparisons: Efficient wars and prosecuting wars efficiently

The foregoing sections illustrate the problematic relationship between military manpower procurement systems and support for war. Certainly, neither pure system dominates generically, and even among the class of partial systems, all we can say unconditionally is that a simple draft is never support-maximizing. But perhaps the unconditional question of support is less important than whether the systems lead to support at the "right" time, i.e., when war is efficient. This section investigates the efficient selection and prosecution of war.

Definition 6. *Let $p_j(b,c)$ represent the probability that a citizen with preferences (b,c) serves in the military, under manpower procurement system $j \in \{(V)olunteer,\ (D)raft,\ (O)ptimal\ Draft\}$. A given war is* $\mathbf{j-efficient}$ *if $\int\int bf(b,c)dbdc \geq \int\int cf(b,c)p_j(b,c)dbdc$.*

This definition applies a utilitarian criterion to determine efficiency: if the expected sum of the benefits outweighs the expected sum of the costs, the war is efficient to prosecute.

Remark 5. *Since the same citizens serve in the military under the volunteer system and the optimal draft, a war is V-efficient if and only if it is O-Efficient. Since citizens select into the military efficiently under these two systems, a war is V-Efficient (and O-Efficient) if it is efficient under any manpower procurement system (including the simple draft and any partial draft system).*

4.1 Efficient war and pure manpower procurement systems

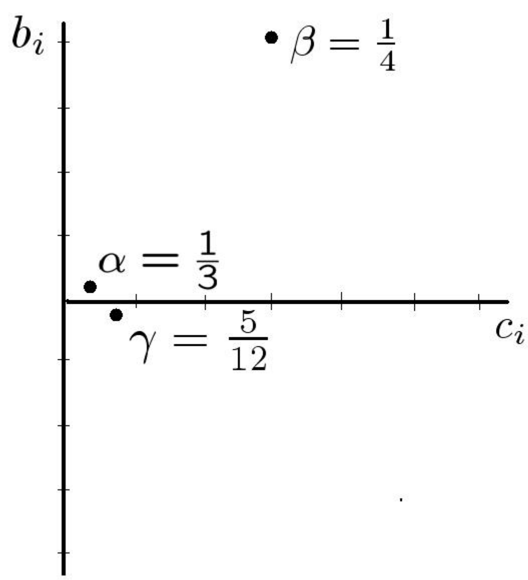
The results on efficient war prosecution mirror those on support. In general, neither manpower procurement system dominates the other in selecting efficient wars. The following proposition summarizes the welfare relationships among the manpower procurement systems.

Proposition 3.

- *There are wars that are V-Efficient and D-Efficient that are prosecuted under the volunteer system but are not prosecuted under the optimal draft (or, therefore, the simple draft), and vice-versa.*
- *There are wars that are not V-Efficient that are prosecuted under the volunteer system but are not prosecuted under the optimal draft (or, therefore, the simple draft), and vice-versa.*

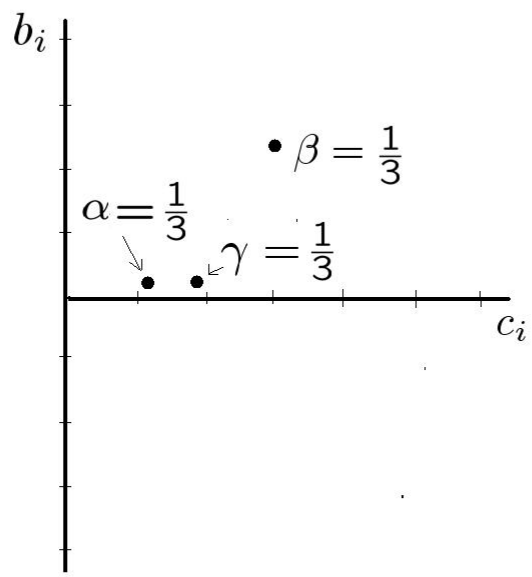
A couple of examples suffice to prove the above proposition. Consider a war with a simple distribution of preferences consisting of three mass points with masses α, β, and γ, where $\alpha+\beta+\gamma = 1$ and $\alpha = d$. Assume $c_\alpha < c_\gamma < c_\beta$ and $b_\gamma < b_\alpha < b_\beta$. Figure 6 represents one configuration that satisfies these criteria.

Figure 6: Example of a preference distribution where an efficient war is prosecuted under a volunteer system but not an optimal draft, when $d = \frac{1}{3}$ and $T = \frac{1}{2}$



Let $\alpha = d = 1/3$, $\beta = 1/4$, $\gamma = 5/12$, $b_\alpha = 2$, $b_\beta = 20$, $b_\gamma = -2$, $c_\alpha = 3$, $c_\beta = 15$, $c_\gamma = 4$. This is a D-Efficient war, since the net benefit is $1/3 * 2 + 1/4 * 20 + 5/12 * (-2) = 4$ and the net cost under the draft is $1/3 * (1/3 * 3 + 1/4 * 15 + 5/12 * 4) = 2.14$. This is the distribution given in Figure 6. The support for the war under the draft is given by $\beta + (1 - d)\alpha = 1/4 + 2/9 = 17/36$, while the support under the volunteer system is $\beta + \alpha = 1/4 + 1/3 = 21/36$. So if the threshold of support needed to start the war is 1/2, this war is prosecuted under the volunteer military but not under the draft. Further, support under both regimes is independent of b_γ, as long as it remains negative, while the net benefit decreases as b_γ decreases, eventually going negative. So, if b_γ is sufficiently negative, a war that is not V-Efficient is prosecuted under the volunteer system but not under the draft.

Figure 7: Example of a preference distribution where an efficient war is prosecuted under a simple draft system, but not a volunteer system, when $d = \frac{1}{3}$ and $T = \frac{1}{2}$



On the other hand, consider an alternative configuration (Figure 7): $\alpha = d = \beta = \gamma = 1/3$, $b_\alpha = 1$, $b_\beta = 12$, $b_\gamma = 1$, $c_\alpha = 6$, $c_\beta = 15$, $c_\gamma = 9$. This is a D-Efficient war, since the net benefit is $1/3(1 + 1 + 12) = 14/3$ and the net cost under the draft is $1/3 * (1/3 * 6 + 1/3 * 9 + 1/3 * 15) = 10/3$. The support for war under the draft is $(1 - d) = 2/3$, while the support under the volunteer military is $\beta = 1/3$. So if the threshold of support needed to start the war is 1/2, this war is prosecuted under the draft but not under the volunteer military. Further, support under both regimes is independent of b_β, as long as it remains above $dc_\alpha = 2$ and below c_β, while the net benefit decreases as b_β decreases, eventually passing the net cost. So, if b_β is just over 2, the benefit is just over 1.33, while the volunteer cost is 2, so this war that is not V-Efficient is be prosecuted under the draft system but not under the volunteer.

4.2 Truncated Normal Example

Return to the example in Figure 3 from section 2.4 in which the citizens' preferences have a truncated bivariate normal distribution. This figure also represents the efficiency of war prosecution under each employment system, as a function of the modal cost (μ_c) and benefit (μ_b). The top diagonal line, labeled D-Efficient, represents the modal benefit above which war is efficient for all employment systems. The bottom diagonal line, labeled V-Efficient, represents the modal benefit below which war is inefficient for all draft systems. The middle region is the area in which war is efficient for the volunteer or optimal draft, but inefficient for the simple draft.

This figure reveals that, at least for the set of truncated bivariate normal distributions under consideration, the volunteer military leads to more support for war only in regions for which war is efficient. The optimal draft, by contrast, tends to lead to more support in regions where war is inefficient.

Furthermore, in this simple example, $S^V > 0.5$ if and only if the war is V-Efficient (numerical calculations available from author). Since the draft leads to more support in that region where war are just barely fails to be V-Efficient, it certainly leads to inefficient wars if the median voter rules. So if war prosecution is decided by majority rule and preferences are normally distributed as in this example, the volunteer military should be strictly preferred. It prosecutes all efficient wars, efficiently, and avoids all inefficient wars. The draft, however, can lead to the prosecution of inefficient wars, and may prosecute them inefficiently (in the case of a simple draft).

5 Extensions

In this section, I work through the effects of several extensions to the base model. None substantially alters the support trade-offs outlined in the base model, but they highlight how the specific results change if we introduce selective service or system-specific costs. They also reveal new results that help illustrate the driving forces in the base model.

5.1 Selective Service

The comparisons above assumed that all citizens were equally 1) able to volunteer and 2) subject to the draft. Realistically, the draft/volunteer-eligible are a subset of society, frequently restricted to the young and often only to men. In this section, I maintain the assumption that a citizen is draft eligible if and only if he is eligible to volunteer, but drop the assumption that this set includes all the citizens.

Assume a fraction $\epsilon \in (d, 1]$ of the citizens are eligible to serve, and assume their preferences are distributed $F^E(b, c)$, while the remaining $1 - \epsilon$ ineligible citizens have preferences distributed according to (potentially different) $F^I(b, c)$. The analysis of the eligible exactly mirrors that in the base model. The only alteration is that voluntarily recruiting a fraction d of the total population requires setting w such that $F_c^E(w) = d/\epsilon$, since soldiers are drawn from eligible citizens, and they comprise a fraction ϵ of society. Given this wage, the support for war among the eligible under each personnel system follows directly from the analysis in section 2.3. Represent the support advantage of the volunteer system over one of the draft systems among the eligible as $\Delta S^E = S_V - S_D$.[13] As in Section 3, represent the support among eligible citizens under a partial draft system in which a fraction $d' < d$ are induced to volunteer and the rest are drafted by $S^E(d'|d)$.

Ineligible citizens support war under the draft if they get positive benefits ($b > 0$), and they support it under the volunteer system if their idiosyncratic benefits outweigh the tax cost ($b \geq dw$). Represent the support advantage of the volunteer system over any draft among the ineligible as $\Delta S^I = F_b^I(0) - F_b^I(dw)$. Note that $\Delta S^I \leq 0$, so there is always at least as much support for war among the ineligible under a draft. The support differential for the ineligible is independent of the efficiency of the draft, so the same differential obtains for the optimal and simple draft. Under a partial draft, the ineligible again support the war if their benefits outweigh the tax costs of the volunteers ($b > d'w'$). Represent this level of support by $S^I(d'|d) = 1 - F_b(d'w')$.

Comparing the total support for war under each system with limited eligibility is straightforward. Combining these two groups, the support advantage of the volunteer system is given by

$$\Delta S = \epsilon \Delta S^E + (1 - \epsilon)\Delta S^I.$$

The support under a partial draft system is given by

$$S(d'|d) = \epsilon S^E(d'|d) + (1 - \epsilon)S^I(d'|d).$$

The following proposition summarizes the effects of restricting draft/volunteer eligibility. The first and last results extend Propositions 1 and 2 directly, while middle two consider the effect of broadening service eligibility.

Proposition 4. *Assume a fraction $\epsilon > d$ of the nation is draft/volunteer eligible. Then*

a) *The volunteer military can lead to more support than an (optimal) draft only if it leads to more support among the eligible. This condition is not sufficient if the eligible make up a small enough fraction of the society.*

b) *If the eligible and ineligible have the same preference distribution, the volunteer support advantage is larger for the eligible than the ineligible.*

c) *If the volunteer support advantage is larger for the eligible than the ineligible and ΔS^E is decreasing in d, then the support advantage of the volunteer system is increasing in the fraction of society who is eligible.*

d) *The simple draft is never support-maximizing in the set of all partial drafts.*

Proof. See Appendix. □

The major intuition from this proposition is that, if the volunteer system is going to lead to more support than the draft, that support must come from among the eligible, since they have a larger (and potentially positive) volunteer support differential. And so for many purposes it may suffice to think about their preferences. Of course, we may want to think about the "eligible" rather broadly,

[13]The results below do not depend on which draft system is used.

as it may included both those who serve themselves and those, such as their families, who are also affected by their service. With some reasonable restrictions on the way support among the eligible changes as a greater fraction of them are recruited, I find that as more and more people become eligible, maybe due to medical progress or changes cultural mores about women and combat, the volunteer military should become more likely to lead to more support.

Moving beyond the simple systems, recognizing that not everyone is eligible does not overturn the main result regarding the increase in support as we move away from a pure draft. The intuition here is that same as in section 3. Increasing from $d' = 0$ is a second-order reduction of support among the eligible and ineligible, but a first-order increase among the eligible.

5.2 System-Specific Costs

In this section, I consider two costs which are specific to the employment system used. The first is the deadweight loss (DWL) of taxation, which applies only to the volunteer system and has played a prominent role in the extant comparison of the two employment systems (Lee and McKenzie (1992); Ross (1994); Warner and Asch (1996).) The second cost affects the draft system by allowing for slow-going or lower productivity among draftees.

A simple way to introduce a DWL of taxation in the base model is to require the government to collect $k > 1$ dollars for every dollar spent. This change has no effect on the analysis of the draft, but increases the tax burden felt by each citizen under the volunteer system to dwk. In reference to Figure 1, the change shifts upward the line separating regions C, D and E from regions G, H, and I, increasing the size of the draft-advantaged region. Intuitively, the decision to volunteer is unaffected, since it turns on a comparison of w to c, but all citizens require a greater benefit from war in order to support it. The introduction of DWL decreases the volunteer support advantage, and it decreases that advantage more if there were many with benefits near the frontier. Nevertheless, a pure draft is never support-maximizing since increasing the wage from zero still induces a second-order loss of support in exchange for a first-order gain.

A simple way of introducing differential productivity among draftees is to require the government to draft $n > 1$ draftees for every volunteer required, so if a war required d soldiers under the volunteer system it requires nd draftees. In reference to Figure 1, this change causes no shifts in the regions, but rather affects the degree of differential support in each region. When equal numbers of troops were required under each system, no citizens in regions G,H, or I supports the war under the volunteer system, but the fraction $(1 - d)$ who were not drafted support it under the draft. If a greater fraction were drafted, it reduces support in these regions. Similarly, everyone in regions C,D, and E supported the war under the volunteer system, but only the non-draftees did under that draft system. If a larger fraction must be drafted, the volunteer support advantage in those regions increases to $kd > d$. The net effect of these two changes is to increase the volunteer advantage, and that change is bigger if there are more people in the "swing" regions of moderate benefits.

6 Conclusions

This paper has theoretically investigated the effect of military manpower procurement systems on the support for war, efficient war prosecution, and the prosecution of efficient and inefficient wars.

I identified the conditions under which the draft leads to more support than the volunteer military, and vice-versa. I identified the conditions (if any) under which pure systems dominate a mixed partial draft system, in terms of support for war. Finally, I demonstrated that either system can fall victim to both type-1 and type-2 errors in war selection that the other system avoids.

For a family of truncated normal preference distributions, several further implications arose. Specifically, the draft leads to more support for war when the overall level of support is relatively low, while the volunteer military leads to more support when it is relatively high. The draft leads to more support when war is inefficient, and the volunteer military leads to more support when war is efficient. Finally, we should expect the draft to lead to more war in political systems with relatively low support requirements for war, and the volunteer military to lead to more war in politicals system with relatively high support requirements.

A number of interesting paths for future work on this topic present themselves. I have taken the manpower procurement system as exogenous, but integrating the simultaneous choice of manpower procurement and war instigation in a unified political and economic model would be extremely interesting. I have derived results for general preferences distribution and have remained agnostic about the true empirical distribution of preferences. Since the welfare consequences of each system depends on this distribution, an estimate of it would be incredibly valuable for applying this framework.

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7 Appendix

Proof for Proposition 2 $\frac{dS}{dw'} = \frac{\partial S}{\partial w'} + \frac{\partial S}{\partial d'}\frac{\partial d'}{\partial w'}$. Since $d' = F_c(\frac{1-d'}{1-d}w')$, the implicit function theorem gives

$$\frac{\partial d'}{\partial w'} = \frac{f(w'(1-d')/(1-d))(1-d')}{1-d+w'f(w'(1-d')/(1-d))}.$$

Formally, support for war is given by

$$S(d'|d) = I + II + \frac{1-d}{1-d'}III,$$

where

$$I = \int_0^{w'(\frac{1-d'}{1-d})}\int_{c-(1-d')w'}^{\infty} f(b,c)dbdc$$

$$II = \int_{w'(\frac{1-d'}{1-d})}^{\infty}\int_{c+d'w'}^{\infty} f(b,c)dbdc$$

$$III = \int_{w'(\frac{1-d'}{1-d})}^{\infty}\int_{d'w'}^{c+d'w'} f(b,c)dbdc.$$

And so

$$\frac{\partial S}{\partial d'} = \frac{\partial I}{\partial d'} + \frac{\partial II}{\partial d'} + \frac{\partial III}{\partial d'}\frac{1-d}{1-d'} + \frac{1-d}{(1-d')^2}III,$$

while

$$\frac{\partial S}{\partial w'} = \frac{\partial I}{\partial w'} + \frac{\partial II}{\partial w'} + \frac{\partial III}{\partial w'}\frac{1-d}{1-d'}.$$

Applying Leibniz's Rule,

$$\begin{array}{rcc}
\frac{\partial I}{\partial d'} & = & -w'\int_0^{w'\frac{1-d'}{1-d}} f(c-(1-d')w',c)dc - \frac{w'}{1-d}\int_{w'd\frac{1-d'}{1-d}}^{\infty} f(b,w'\frac{1-d'}{1-d})db \\
\frac{\partial II}{\partial d'} & = & -w'\int_{w'\frac{1-d'}{1-d}}^{\infty} f(c+d'w',c)dc + \frac{w'}{1-d}\int_{w'\frac{1-dd'}{1-d}}^{\infty} f(b,w'\frac{1-d'}{1-d})db \\
\frac{\partial III}{\partial d'} & = & w'\int_{w'\frac{1-d'}{1-d}}^{\infty}[f(c+d'w',c)-f(d'w',c)]dc + \frac{w'}{1-d}\int_{d'w'}^{w'\frac{1-dd'}{1-d}} f(b,w'\frac{1-d'}{1-d})db \\
\frac{\partial I}{\partial w'} & = & (1-d')\int_0^{w'\frac{1-d'}{1-d}} f(c-(1-d')w',c)dc + \frac{1-d'}{1-d}\int_{w'd\frac{1-d'}{1-d}}^{\infty} f(b,w'\frac{1-d'}{1-d})db \\
\frac{\partial II}{\partial w'} & = & -d'\int_{w'\frac{1-d'}{1-d}}^{\infty} f(c+d'w',c)dc - \frac{1-d'}{1-d}\int_{w'\frac{1-dd'}{1-d}}^{\infty} f(b,w'\frac{1-d'}{1-d})db \\
\frac{\partial III}{\partial w'} & = & d'\int_{w'\frac{1-d'}{1-d}}^{\infty}[f(c+d'w',c)-f(d'w',c)]dc - \frac{1-d'}{1-d}\int_{d'w'}^{w'\frac{1-dd'}{1-d}} f(b,w'\frac{1-d'}{1-d})db
\end{array}$$

And so when $w'=0$ and $d'=0$, $\frac{\partial I}{\partial d'} = \frac{\partial II}{\partial d'} = \frac{\partial III}{\partial d'} = \frac{\partial III}{\partial w'} = 0$ and $\frac{\partial I}{\partial w'} = -\frac{\partial II}{\partial w'}$, so

$$\frac{dS}{dw'} = (1-d)III\frac{\partial d'}{\partial w'} = IIIf_c(0) \geq 0.$$

When $w'=w$ and $d'=d$,

$$\begin{array}{rcc}
\frac{\partial d'}{\partial w'} & = & \frac{f_c(w)(1-d)}{1-d+df_c(w)} \\
\frac{\partial S}{\partial w'} & = & (1-d)\int_0^w f(c-w+dw,c)dc - d\int_w^{\infty} f(dw,c)dc \\
\frac{\partial S}{\partial d'} & = & -w\int_0^w f(c-w+dw,c) - w\int_w^{\infty} f(dw,c)dc,
\end{array}$$

and so

$$S'(d|d) = \frac{1-d}{1-d+wf_c(w)}\left[(1-d)\int_0^w f(c-w+wd,c)dc - \left(d+\frac{wf_c(w)}{1-d}\right)\int_w^{\infty} f(dw,c)dc\right].$$

Proof of Proposition 4

a) $\Delta S = \epsilon\Delta S^E + (1-\epsilon)\Delta S^I$. From the discussion in the text, $\Delta S^I < 0$, so for any positive ΔS^E, there is an $\underline{\epsilon}$ such that $\Delta S < 0$ if $\epsilon < \underline{\epsilon}$.

b) $S'(0|d) = \epsilon S'^E(0|d) + (1-\epsilon)S'^I(0|d)$. Once can show that $S'^E(0|d) > 0$ by an argument identical to that in section 3. Furthermore, $S^I(d'|d) = \int_{d'w'}^{\infty} f_b^I(b)db$, so

$$S'^I(d'|d) = -(w' + d'(\frac{\partial w'}{\partial d'}))f_b(d'w'),$$

but at $d'=0$ we have $w'=0$ and so $S'^I(0|d) = 0$.

c) Consider the volunteer system. Any preference combination (b,c) that supports war under that system as an ineligible also supports it as an eligible, since they pay the same costs and may get some of the wages. Consider the draft system. Any preference combination (b,c) that supports war under that system as an eligible also supports it as an ineligible, since they bear none of the costs. If the preference distributions are the same for both groups, this suffices to prove the proposition.

d) Let $\Delta S^I(W)$ represent the volunteer support differential among the ineligible, when the total wage bill is $W = dw$. It is easy to show that this differential is decreasing in W and negative and that W is decreasing in ϵ. Let $\Delta S^E(d/\epsilon)$ represent the volunteer support differential among the eligible when a fraction d of society are required to fight the war and the eligible make up a fraction ϵ. Assume that $\Delta S'^{E}() < 0$ so the volunteer support differential is decreasing in the fraction of the eligible we need to recruit. Then, $\frac{d\Delta S}{d\epsilon} = [\Delta S^{E}(d/\epsilon) - \Delta S^{I}(W)] - \frac{S'(d/\epsilon)}{\epsilon} + (1-\epsilon)\Delta S'^{I}(W)(\frac{dW}{d\epsilon})$. The first two terms are positive by assumption, and the third is positive since the wage bill declines.