A NOTE ON SOCIAL WELFARE LOSSES WITH AND WITHOUT THE DRAFT

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I. INTRODUCTION

Past research on the subject of the draft has failed to consider adequately the economic or social costs of alternative manpower procurement policies. Although the literature provided valuable guidance on the budget implications of a volunteer military, it tended to treat the removal of the draft as primarily an issue of tax burden shifting. Discussions of social costs, and the corresponding social welfare losses under the draft, were generally confined to vague references to the over-employment of labor encouraged by the low draft wage.[1]

Borcherding (3) was the first to recognize that there might be social welfare losses under a volunteer military as well--those arising from an underemployment of military labor in the absence of the draft, given the upward-sloping nature (curve) of military labor supply. Borcherding argues further that it is difficult to determine *a priori* whether social welfare losses are greater with or without the draft. As manpower strengths are reduced in the face of increasing costs, Borcherding's argument assumes a potential importance, since such reductions could well lead to a military labor force smaller than that which is socially optimal.

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[1]The most notable exception is Sjaastad and Hansen (23) who attempt to measure the costs of "collecting" the conscription tax, where such costs are primarily those associated in the draft avoidance. Hansen and Weisbrod (10) address the "distribution" and "allocative" costs of the draft. Neither model, though, is sufficiently general to allow one to estimate the social welfare losses under alternative manpower procurement policies.

Therefore it would seem appropriate to reconsider carefully the social costs associated with draft and no-draft forces. Before doing so, however, it is worth considering what is meant by "economic" and "social" costs. By an individual's economic cost, I mean the opportunity cost *to society*, in the form of productive civilian output foregone, of employing that individual in the military. By an individual's social cost, I mean the opportunity cost *to the individual* of being employed in the military. Aggregating across individuals provides the total economic and social costs, respectively.

Traditionally, and empirically, an individual's economic cost has been interpreted as his alternative civilian wage, whereas social cost has the straightforward meaning of his reservation wage.[1] This measure of economic cost poses certain problems when evaluating the economic cost of labor during the draft, since the individual is encouraged to engage in activities designed to avoid military service so long as his reservation wage is greater than the draft wage. Such activities frequently involve "real" resource costs (e.g., medical expenses, legal expenses, going to school, fleeing the country, etc.), so that economic costs under the draft include more than just alternative civilian wages.

Taking the above into account, the remainder of this note addresses the issue of social cost under alternative manpower procurement policies. It will be shown that social welfare losses remain a distinct possibility in the absence of the draft, corresponding to Borcherding's concern, but that these costs are considerably less than the social welfare losses under the draft.

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[1]Using these definitions, social cost is then economic cost plus (minus) the disutility (utility) of serving in the military.

II. A SIMPLE MODEL OF SUPPLY AND DEMAND

Consider first a simple model of military labor supply and demand, such as that used by Borcherding. Assume for the present that military labor supply and demand can be stated in terms of labor efficiency units, so that the demand for labor can be represented by DD and the supply of labor can be represented by SS', as shown in Fig. 1.

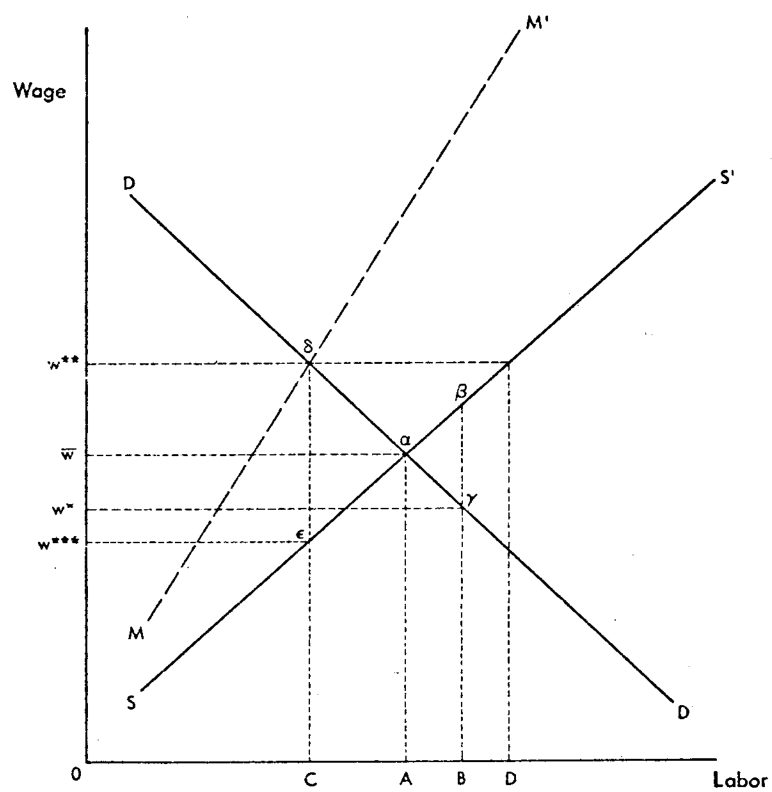

Fig. 1—Simple model of military labor supply and demand

Assmming that the military responds to the budget costs of factor inputs, not to the supply prices, the draft will lead to an overemployment of labor if the draft wage is less than the market-clearing wage.[1] For

[1]Borcherding argues that if the military responds to the supply price of labor rather than to the budget cost, then draft and volunteer forces yield essentially the same results--because under both scenarios, OA labor resources will be demanded. However, it will be shown later that this is correct only if the draft discriminates such that those at the low end of

example, if the draft wage is w* in Fig. 1, then OB labor resources will be demanded, which exceed the optimum amount OA by AB.[1] Assuming that the supply curve represents the social cost of labor resources and that the demand curve represents the value of labor resources to the military, the social welfare loss resulting from this overemployment of labor under the draft is then given by the area $\alpha\beta\gamma$ in Fig. 1.[2]

Alternatively, since the military faces an upward-sloping supply curve for labor in the absence of the draft, a volunteer force will result in an underemployment of labor since the marginal outlay curve MM' lies above the supply curve SS'. (That is, if one is to argue that the military responds to budget costs under the draft, one must also assume, for consistency, that they will do likewise without the draft.) The welfare loss from this deadweight burden is therefore given by the area $\alpha\delta\varepsilon$.[3]

To gain some notion as to the relative magnitudes involved, assume that the elasticity of supply is 1.25, that the elasticity of demand is 1.0 and that the draft wage w^* is 85 percent of the market-clearing wage $\bar{w}$.[4] Under these assumptions, the social welfare loss from the over-

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the supply curve are drafted first, for the notion of "supply price" is not well defined if the military selects individuals at random along the supply curve.

[1] Distances will be shown in roman type; areas will be shown in italics.

[2] Over the years, there has been a considerable discussion in the literature about the problems associated both with defining and measuring consumers' and producers' surpluses. Recognizing that there are certain difficulties, I will nevertheless proceed to measure social welfare loss as the area under the demand curve less the area under the supply curve. For a discussion of consumers' surplus, see Hicks [11] and [12] and Mishan [18]; for a discussion of some of the problems with measuring consumers' and producers' surpluses, see Samuelson [22] and Mishan [17], respectively.

[3] Note, however, that if the military also faces an upward-sloping supply curve for capital and if the elasticity of demand for national defense with respect to price is less than one, the social welfare loss from an underemployment of labor will be less than $\alpha\delta\varepsilon$. In particular, if the supply curves for capital and labor are identical, if the demand curves for capital and labor are identical, and if the demand for national defense is completely price inelastic, then there is no social welfare loss since OA labor resources will be demanded.

[4] As will be shown in the next section, one of the important difficulties in using this simple model is the failure to capture the effects

employment of labor under the draft (the area $\alpha\beta\gamma$) is 2.6 percent of the equilibrium wage payment whereas that from the underemployment without the draft (the area $OA\alpha\bar{w}$) is 8.1 percent, as shown in the Appendix.[1] Assuming that the $18.1 billion spent for military pay and allowances in 1973 approximates the equilibrium wage payment, these social welfare losses would amount to roughly $0.5 billion and $1.5 billion for over and underemployment, respectively.

These results suggest that the volunteer forces might have larger social welfare losses than a draft-induced force. However, if the analysis is extended to include military pay mechanisms and the military labor force structure, then it becomes clear that this simple model leads to an overestimation of the social welfare losses resulting from the volunteer force and an underestimation of those from the draft.

These extensions are concerned primarily with the proper measurement of the areas $\alpha\beta\gamma$ and $\alpha\delta\varepsilon$. It will also be shown that an equally, if not more important shortcoming of the basic model arises from the method of measuring social costs during the draft. In particular, viewing social costs as the area under the supply curve underestimates the cost of the draft, since the supply curve is not an accurate measure of the social cost of labor employed by the military during the draft and since the cost of the draft also includes costs incurred by those not employed by the military.

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of the distinction between first-term and career labor. Although discussion of these effects can be generally postponed until the next section, the calculation of w* does require recognition of the first-term/career distinction. That is, since w represents an average of first-term and career wages and since the draft had its primary effect on the wages for first-termers, w* must be calculated as an average of w_f*, the draft-wage for first-termers, and $\bar{w}_c$, the market wage for careerists. Assuming that the w_f* was about 70 percent of the market clearing wage for first-termers (consistent with the Gates Commission estimate) and that first-termers made up about 65 percent of the force, w* can be estimated as being in the ballpark of 85 percent of $\bar{w}$. See the Appendix.

[1]Since the elasticity of demand was assumed to be one, note that $OA\alpha w$ equals $OB\alpha w^*$.

III. EXTENSIONS OF THE SIMPLE MODEL

The simple model outlined above provides a basic framework for measuring the social cost of maintaining a military labor force. Though failing to capture fully the effects of manpower procurement policy on social costs, many of the shortcomings of this simple model of supply and demand can be handled by extending the basic framework, *if one assumes that the draft selects first those who are farthest down on the supply curve.*

A. THE MILITARY AS A DISCRIMINATING MONOPSONIST

To the extent that the military acts as a discriminating monopsonist, the marginal cost curve for labor will lie between SS' and MM' and the area $\alpha\delta\varepsilon$ will be correspondingly smaller.[1] In contrast to Borcherding's assumption that wage discrimination is unlikely, the military services engage in a number of practices which enable them to discriminate, albeit crudely, according to supply price. Consider the following wage variations.

Enlistment bonuses for the combat arms occupational specialities are limited to individuals who are high school graduates and who score average or above average on the mental aptitude examinations, those individuals one would expect to have higher reservation wages. Similarly, those with higher mental aptitude scores and educational achievement generally receive the better jobs. Finally, recruiters are usually authorized only a limited number of slots for the shorter enlistment tours, with the result that these shorter enlistments are given only to those individuals who appear otherwise reluctant to join--hence, those with higher reservation wages. These are but a few of the many ways the military has of discriminating according to supply price.

Although the military is far from being a perfectly discriminating monopsonist, these practices nevertheless suggest that the marginal cost curve lies to the right of MM' in Fig. 1, so the area $\alpha\delta\varepsilon$ is correspond-

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[1] In the limit, the marginal cost curve for the perfectly discriminating monopsonist equals the average cost curve for the ordinary monopsonist--i.e., the supply curve. See Robinson (21).

ingly smaller.[1] To illustrate the effect on this area, suppose that the marginal cost curve taking this partial discrimination into account lies halfway between SS' and MM'. This reduces the social welfare loss of underemployment by nearly three times--from 8.1 percent of the equilibrium wage payment to 2.8 percent, as shown in the Appendix.

B. THE MILITARY AS A CONSTRAINED MONOPSONIST

The calculation of the deadweight burden of the volunteer force from the simple model is based on the assumption that, since the supply curve for labor is upward sloping, the average wage curve is also upward sloping. However, assuming that the average wage curve actually faced by the military is upward sloping over the *entire range* of supply offerings ignores a fundamental aspect of the entire volunteer debate.

In particular, the Gates Commission argued that first-term military wages should be raised to a level "comparable" with what is found in the civilian sector, irrespective of the volunteer force.[2] Therefore, the military is constrained as a monopsonist since it does not face the economic supply curve SS' in Fig. 1, but instead faces a combined political-economic average wage curve. This is essentially the traditional problem of a minimum wage imposed on a monopsonistic employer.[3]

The principal issue, then, is how this so-called "comparable" wage w_c compares with the market-clearing wage $\bar{w}$. If the "comparable" wage equals the market-clearing wage, then the volunteer force does not lead to a social welfare loss. Alternatively, if the comparable wage does not equal the market-clearing wage, an underemployment of labor by the military results. In general, though, it can be shown that the social welfare loss in the constrained monopsonist case will be less than $\alpha\delta\varepsilon$

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[1] Note that although the perfectly discriminating monopsonistic solution leads to the socially optimal level of employment in the military (so that the social welfare loss is zero), this solution is not Pareto optimal since it transfers rents from the suppliers of military labor to the general taxpaying public, thereby making some better off at the expense of others.

[2] What actually would have transpired in the absence of the volunteer force is, of course, open to debate.

[3] See, for example, Alchian and Allen [1], pp. 402-403.

in Fig. 1 if the comparable wage is greater than the monopsony wage, but less than the marginal cost to the monopsonist (that is, if $w^{***} < w_c < w^{**}$).

Since the volunteer force was preceded by a sizable pay increase, it is probable that the comparable wage is greater than the monopsonistic wage (i.e., $w^{***} < w_c$). On the other hand, it is unlikely that the comparable wage exceeds the monopsonist's marginal cost because that would imply that the military is facing an *excess* supply of volunteers of more than 110 percent as shown in the Appendix, a result consistent with neither the experience to date nor the Gates Commission estimates. Thus, although an underemployment of labor remains a distinct possibility--indeed, a probability given the unlikelihood that w_c exactly equals $\bar{w}$--the social welfare loss emanating from this underemployment would appear to be considerably less than that implied by the simple supply and demand analysis shown in Fig. 1.

C. MILITARY LABOR SUPPLY UNDER THE DRAFT

Whereas open markets and the lack of barriers to entry and exit generally enable economists to think of labor supply and demand in terms of efficiency units (such as Borcherding's "labor time"), the special nature of the military labor system poses certain problems for measuring the effect of the draft on the utilization of labor.[1] Specifically, the military is a closed system where entry occurs only at the bottom. Empirically, it is useful to structure the military labor system into two components: first-term labor and career labor, where first-termers are defined as those with less than four years of completed military service and careerists are those with four or more years. In this regard, it is noteworthy that whereas an upward-sloping supply curve for first-termers is new with the volunteer force, the military has always faced an upward-sloping supply curve for careerists.

With no draft, the dichotomy between first-term and career labor is less of a problem, so that one can state the supply curve for labor in terms of efficiency units, as reflected by SS' in Fig. 1. The reason

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[1]For a discussion of labor aggregation functions, see, for example, Dougherty [6] and Bowles [4].

is that without the draft, the wage rates for first-termers and careerists are both determined by market conditions, at least on the supply side. Each point on the SS' curve represents, in effect, the equilibrium employment of first-termers and careerists and the equilibrium first-term and career wage rates, so that SS' is the locus of points for the supply of efficiency units as a function of the cost per efficiency unit. Therefore, SS' can be viewed as the appropriate long-run supply of labor to the military in the absence of the draft, with the result that the area $\alpha\delta\varepsilon$ of Fig. 1 represents the social welfare loss associated with the volunteer force (excepting, of course, the reductions in $\alpha\delta\varepsilon$ to be expected if the military is either a discriminating or a constrained monopsonist).

In the presence of the draft, however, this model is no longer appropriate, for the draft had an asymmetric effect on the military labor system. In particular, the draft guaranteed a virtually unlimited supply of first-termers at a less than market-clearing wage on the one hand, while the wages for careerists were more-or-less market-determined on the other. The effect of this was to encourage an overemployment of first-termers (both absolutely and relatively).

It is thus clear that one must explicitly consider at least a three-factor production function when analyzing the effect of the draft on the employment of labor (where the factors of production are capital, first-term labor, and career labor), instead of the two-factor production function implicit in the analysis thus far. That is, whereas the labor aggregation function generally enables one to circumvent the problem of multiple labor inputs, the fact that the military faces such different markets on the supply side for first-termers and careerists (e.g., careerists are drawn solely from the pool of first-termers) necessitates treating these as separate inputs. Although the three-factor production function complicates the problem considerably, the following partial analysis serves to illustrate the effect of the draft on the social welfare loss when one considers the distinction between first-term and career labor inputs.

Given the presumed substitutability of first-term and career personnel, one would expect the demand for first-term labor to be more elastic than the demand for labor efficiency units, as shown in Fig. 2: DD can

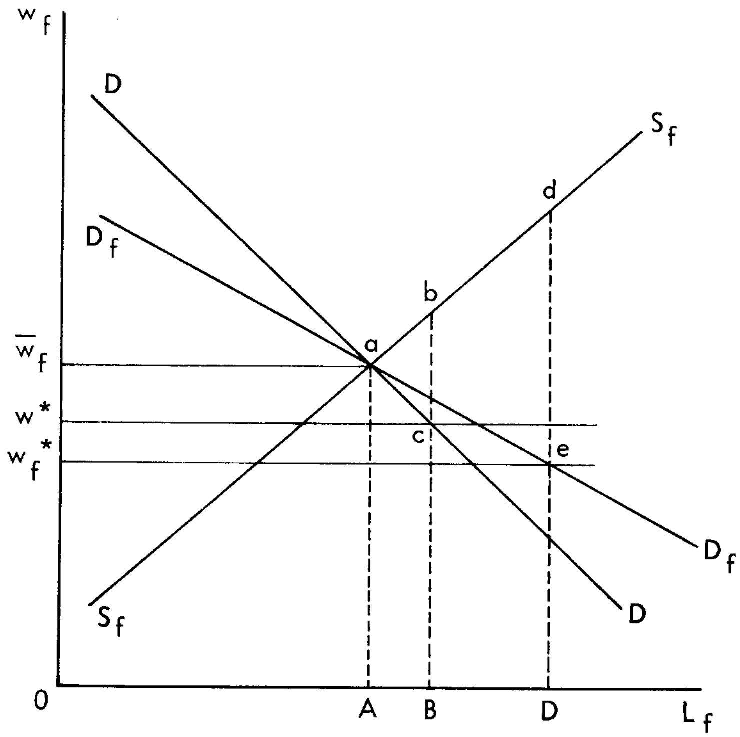

Fig. 2 — First-term labor supply and demand

be interpreted as the demand for first-term labor as a function of first-term wages, assuming that career wages change proportionately (i.e., holding the ratio of first-term to career wages constant);[1] D_fD_f can be interpreted as the demand for first-term labor as function of first-term wages, holding the supply function for career labor constant.

The welfare loss from the overemployment of first-termers under the draft is therefore given by the area *ade* in Fig. 2. Note that this is considerably larger than the area *abc*, the welfare loss implied when one fails to take into account the distinction between first-term and career labor.[2]

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[1]Note that the curve DD in Fig. 2 *implicitly* assumes that wages for first-termers and carrerists move together. Therefore, DD in Fig. 2 is analogous to DD in Fig. 1.

[2]Note that w^* from Fig. 1 lies above w_f^*, as shown in Fig. 2, since w^* is a weighted average of w_f^* and $\bar{w}_c$ (the market wage for careerists). In particular, w_f^* is assumed to be $0.7\ \bar{w}_f$ (consistent with the Gates Commission conclusion that first-term pay would have to be raised by 40 percent to be competitive with civilian pay). As shown earlier, this led to the assumption that $w^* = 0.85\ \bar{w}$.

The total welfare loss during the draft must, of course, be measured in terms of the total labor input. Although we cannot determine on an *a priori* basis whether the draft will lead to an over- or underemployment of careerists, since this depends on the elasticities of substitution among factor inputs and the elasticity of demand for national defense, the total social welfare loss--taking into account the effects on both first-termers and careerists--will be considerably more than the area $\alpha\beta\gamma$ implied in Fig. 1. Indeed, this could yield the seemingly paradoxical result that social welfare losses arise from an *overemployment* of first-termers and an *underemployment* of careerists.

To illustrate the effect of extending the simple model to include the first-term/career distinction, some simple calculations suggest that the social welfare loss under the draft would be in the neighborhood of $2.4 billion in 1973 dollars.[1] Note that this is almost five times the $0.5 billion estimated earlier from the simple model. More important, this shows that to the extent that one subset of the labor force bears a disproportionate share of the burden of overemployment, as was the case under the draft, the social welfare costs of overemployment will be larger than if the burden was distributed proportionately.

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[1]This is based on a series of assumptions that I feel are not too unreasonable and on the solution to a set of simultaneous equations, which, because of space limitations, are not presented here. For a full description, see Cooper [5]. Briefly, the primary difference between this and the earlier calculation is that while the elasticity of demand for labor efficiency units is assumed to be 1.0 (as before), the elasticity of demand for first-term labor is assumed to be 1.5.

IV. MEASURING THE APPROPRIATE SOCIAL COST

Up to this point, the calculation of social welfare losses has depended on the assumption that the supply curve approximates the gross social cost of maintaining a military labor force.[1] This is probably a reasonable assumption with a volunteer military, since the supply curve represents the mechanism by which labor resources are allocated under a price system. However, when labor resources are allocated other than by price, as with the draft, the supply curve has meaning as a measure of social cost only if the draft is structured so as to select first those individuals farthest down on the supply curve--a policy that has been rejected as socially inequitable[2]--or the entire age cohort is drafted.

The area under the supply curve fails as a measure of gross social cost under the draft for two reasons. First, to the extent that the draft selects individuals without regard to supply price, the area under the supply curve underestimates the social cost of labor actually employed by the military. Second, individuals whose supply price exceeds the draft wage have an incentive to avoid the draft and their efforts to do so frequently involve the expenditure of resources. These incentives apply to the entire pool of draft eligibles, not just those employed by the military. Moreover, even if an individual is not drafted, he may face restricted employment

[1] This discussion of social welfare loss (or, equivalently, net social cost) has not yet had to deal with the gross social cost because the area under the supply curve could be assumed to represent gross social cost. Therefore, net social cost could be defined relative to the competitive equilibrium. When resources are allocated other than by price, though, we must consider specifically the issue of gross social cost.

[2] In 1918, draft boards were expressly advised to draft first those individuals with the least-valued civilian alternatives. Explicit policies such as these were abandoned as socially repressive when peacetime conscription was reintroduced in 1950, even though more subtle means of discrimination (such as college deferments) were present prior to the lottery.

opportunities since employers may be reluctant to hire individuals who are eligible for the draft. Therefore, the social cost of labor employed by the military underestimates the cost to society of maintaining a military labor force under the draft. Instead, the cost to society is the social cost of labor employed by the military plus whatever costs are incurred by those who do not enter the military.

Turning first to the measurement of the social cost associated with those employed by the military, the area under the supply curve (*OBbS* in Fig. 3) underestimates the gross social cost of labor during the draft as long as any individuals with supply prices greater than w' are selected. Suppose, for the sake of illustration, that the draft is truly random and, moreover, that the draft represents the sole source of manpower. Those who are drafted will therefore be distributed evenly along the supply curve SS'.[1] Assuming that the total eligible cohort is given by the distance OC and that OB labor resources are demanded, the curve SS" represents the *locus of supply prices* for those actually employed in the military during the draft.[2]

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[1]The draft process has never been entirely random in this regard. For example, under the "oldest first" policy used prior to the lottery, one would expect two opposing effects. On the one hand, given that older individuals would be expected to have better civilian opportunities than those in their late teens, this policy would be expected to draw a proportionately larger share of individuals from the upper portion of the supply curve. On the other, the wide range of draft deferments allowed those on the upper end to more easily avoid the draft. With the introduction of the lottery, the reverse would be expected, since the lottery was a "youngest first" system, but most deferments were eliminated.

[2]That is, when the draft is structured so that all supply prices are proportionately represented, the curve SS" is obtained simply by multiplying the distance from the vertical axis to the supply curve SS' by the ratio OB/OC. Historically, of course, the draft has never been truly random (see footnote 1) and conscripts have only partially fulfilled manpower requirements. The remainder was supplied by "voluntary" enlistments--some "true volunteers" (those on the Se portion of the supply curve) and some draft-motivated (who, presumably, are located toward the lower end of the supply curve, but above w*). Although this complicates the computation, it does not alter the basic approach. In particular, so long as any individual with a supply price above w' is drafted, the curve SS" will lie to the left of the supply curve SS'. In general, if the draft selects more heavily from the upper end of the

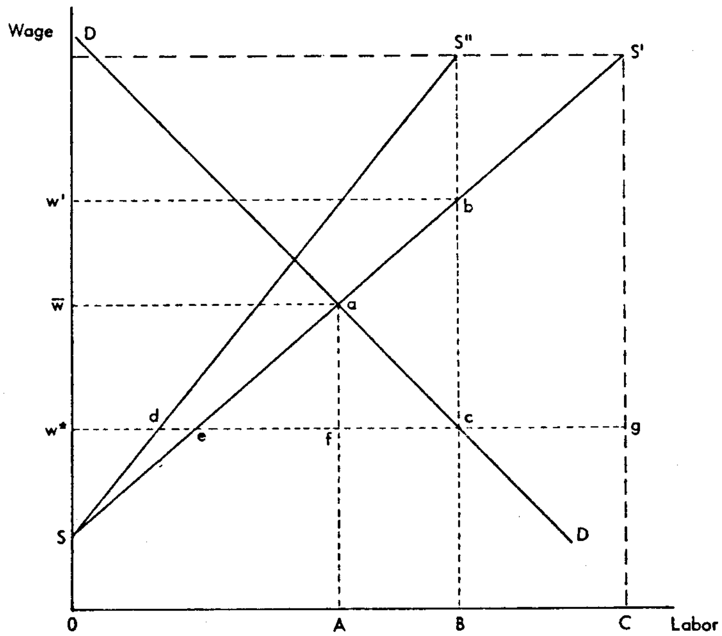

Fig. 3 — Measuring the social cost of the draft

The gross social cost corresponding to the draft is then given by the area *OBS"S* in Fig. 3, not the area *OBbS*, which is the standard measure of gross social cost (i.e., the area under the supply curve).[1] Therefore, the social welfare loss--or net social cost--from labor employed during the draft is not *abc*, as implied by the standard model, but is instead *abc* plus the area *SbS"*.[2] Note further the seemingly

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supply curve, SS" will lie to the left of SS" as drawn in Fig. 3; conversely, selecting more heavily from the lower end will leave SS" to the right of SS" as drawn (but still to the left of SS').

[1]Although Hansen and Weisbrod recognize the basic issue, they assume that the area *OBbS* represents the minimum foregone civilian output. This will be true only if supply price is perfectly correlated with the individual's alternative civilian wage. Therefore, although *OBbS* represents the minimum social cost, where social cost is defined in terms of opportunity cost to the individual, it does not necessarily represent the minimum civilian output foregone.

[2]Implicit here is the assumption that all individuals are of equal value to the military (or, at least, that an individual's value to the military is unrelated to his supply price). To the extent that the marginal productivity in military employment is higher for those with higher (lower) reservation wages, the social welfare loss will be less (more).

paradoxical result that as the fraction of the cohort drafted nears unity, the curve SS" moves closer to SS', thereby reducing the social welfare loss under the draft since *SbS"* becomes correspondingly smaller.[1]

As noted above, the social cost of labor employed by the military represents only part of the social cost of the draft because those not employed by the military may also bear costs. These latter costs may take two forms: (1) costs incurred to avoid the draft (e.g., remaining in school, fatherhood, medical and legal expenses, emmigration, etc.) and (2) costs incurred as a result of reduced employment opportunities for those who are draft eligible.[2]

Analytically, it is more difficult to measure the costs associated with those not employed by the military than the costs associated with those who are, since the former depend on a number of unknown parameters, including the individual's propensity to engage in draft avoidance measures, the probability of being drafted, and the reduction in employment opportunities as a result of being draft eligible, among others. For example, an individual whose preferred employment is draft deferable may "pay" little or no cost, whereas one whose preferred employment is not draft deferable may "pay" a substantial cost.

In general, the maximum draft avoidance cost an individual will be willing to pay is the difference between his reservation wage and the draft wage, since paying more will leave him worse off (by definition) than if he joins the military. Similarly, the cost of reducing an individual's employment opportunities can be measured as the reduction in his returns (both pecuniary and nonpecuniary) caused by these employment restrictions. However, if such a reduction exceeds the difference

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[1] It is interesting to note that most Western European nations with conscription employ a system of "universal service" in which the entire age cohort is drafted, thereby reducing the magnitude of these social welfare losses (though possibly at the expense of increased social welfare losses from increased personnel turnover).

[2] Sjaastad and Hansen's "costs of collection" are similar to these draft-avoidance costs. Hansen and Weisbrod's "labor mobility costs" would seem to include some draft-avoidance costs and some of the costs associated with reduced employment opportunities.

between the individual's supply price and the draft wage, he will join the military, so that this difference again represents the maximum social cost imposed on him.[1]

In general, the maximum draft avoidance cost above is not a very useful measure since most individuals will not expend this maximum. At the same time, Sjaastad and Hansen estimate that the "costs of collection" of the conscription tax are one to two times as large as the tax itself, thus implying that the additional social cost of the draft,[2] over and above that associated with overemployment, is far from negligible.

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[1]The aggregate maximum social cost from draft avoidance and reduced employment alternatives is therefore given by the area egS' in Fig. 3, where an amount equal to dcS'' is borne by those employed by the military and an amount equal to egS' less dcS'' is the maximum borne by those not in the military.

[2]The size of the conscription tax is something between $w^*fa\bar{w}$ and w^*cbw' in Fig. 3. The ambiguity arises because it is not clear how Sjaastad and Hansen's 2.5 million force compares with OA and OB.

V. CONCLUSIONS

The system of manpower procurement clearly has a substantial effect on the social cost of maintaining a military labor force. Recognizing this, considerable effort during the sixties and seventies was devoted to studying the effects of the draft. Although these efforts undoubtedly played a substantial role in the ultimate disposition of the draft, treatment of the full implications of manpower procurement policy is noticeably incomplete.

Determining the social costs of alternative procurement policies is a difficult task, both theoretically and empirically. As a result, past efforts have tended to focus only on specific pieces of the system, such as the implicit tax imposed on young men of military age, rather than on the more general issue of social costs. The approach presented here, though admittedly incomplete, is offered as a first step toward a more comprehensive treatment of the social costs of maintaining a military labor force under alternative manpower procurement policies.[1]

The results presented here show that the social welfare costs of the draft are likely to be much larger than previously estimated and to be considerably in excess of those costs associated with a volunteer military. At the same time, social welfare losses remain a distinct possibility in the absence of the draft, a possibility which assumes a potential importance in light of the recent and sizeable reductions in manpower strengths. More generally, this analysis points to the importance of the methods for measuring social costs and the need for more comprehensive treatment of these costs as an input to public policy.

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[1]This analysis does not deal with the externalities, positive or negative, that might accompany alternative manpower procurement policies. For example, it has been argued (mostly in the sociological and political science literature) that some positive externality is gained by drafting those who would otherwise not join the military. See, for example, Goldich [9]. Others have argued that a negative externality results from using coercion as a means for allocating resources.

APPENDIX

A. CALCULATING THE SOCIAL WELFARE LOSSES SHOWN IN FIG. 1

To calculate the areas $\alpha\beta\gamma$ and $\alpha\delta\varepsilon$ in Fig. 1, begin by assuming that the supply elasticity is 1.25 (consistent with the Gates Commission) and that the demand elasticity is 1.0 (an arbitrary but perhaps not too unrealistic assumption) and normalize such that OA = 1.0 and $O\bar{w}$ = 1.0.[1] The military labor supply and demand curves are then given as

$$\text{supply:}\quad w = S(L) = L^{0.8} \qquad (1)$$

$$\text{demand:}\quad w = D(L) = L^{-1} \qquad (2)$$

The amount of labor employed without the draft, OC, can be found by identifying the intersection of DD and MM', where the marginal cost curve MM' is given from Eq. (1) as

$$\text{marginal cost:}\quad w = MC(L) = 1.8L^{0.8} \qquad (3)$$

Solving Eqs. (2) and (3) simultaneously yields OC = 0.72, in constrast to the socially optimal amount of 1.0 units of labor.

The area $\alpha\delta\varepsilon$ can then be found by integration:

$$\alpha\delta\varepsilon = \int_{0.72}^{1.0} [D(L) - S(L)]dL = \int_{0.72}^{1.0} L^{-1}dL - \int_{0.72}^{1.0} L^{0.8}dL = 0.081$$

To calculate the area $\alpha\beta\gamma$, assume $w^* = 0.85$.[2] From the demand curve in Eq. (2), 1.18 labor units will be demanded under the draft.

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[1]Note that an elasticity of demand equal to one is consistent with a Cobb-Douglas production function, holding the level of output constant.

[2]While wages for first-term personnel were below the market-clearing wage during the draft, wages for careerists were approximately comparable to those found in the civilian sector. Therefore, w^* is calculated as

area $\alpha\beta\gamma$ can then be found by integration:

$$\alpha\beta\gamma = \int_{1.0}^{1.18} S(L)dL - \int_{1.0}^{1.18} D(L)dL = 0.026$$

To put these figures in some perspective, note that the equilibrium wage payment to labor equals OA x $O\bar{w}$ which, in turn, equals one. Therefore, given the previous assumptions, the social welfare loss under the draft $\alpha\beta\gamma$ equals 2.6 percent of the equilibrium wage payment whereas the social welfare loss under the volunteer force, the area $\alpha\delta\varepsilon$, equals 8.1 percent of the equilibrium wage payment. If we assume that the $18.1 billion in basic pay and allowances for active-duty military personnel in fiscal 1973 approximates the equilibrium wage payment, then the social welfare loss under the draft can be approximated as $500 million and that under the volunteer force as $1500 million (i.e., 0.026 x 18.1 and 0.081 x 18.1, respectively).

B. THE MILITARY AS A DISCRIMINATING MONOPSONIST

Although it is difficult to determine the extent to which the military acts as a discriminating monopsonist, suppose, for the sake of illustration, that the marginal cost curve for labor (taking this discrimination into account) lies half-way between the curves SS' and MM' in Fig. 1. That is, since

$$SS': \quad w = L^{0.8}$$
$$MM': \quad w = 1.8L^{0.8}$$

then

$$MC: \quad w = 1.4L^{0.8} \qquad (4)$$

---

a weighted average of first-term and career pay. In particular, since the Gates Commission estimated that first-term pay was about 30 percent below the market-clearing wage and since first-termers made up between 60 and 65 percent of the enlisted force during the draft, w^* is approximately equal to 0.85.

Equating the marginal cost of labor with the demand of labor (i.e., solving Eqs. [2] and [4] simultaneously) yields 0.83 as the employment of labor with the volunteer force, taking into account that the military can partially discriminate. The social welfare loss (s.w.l.) can then be calculated as

$$\text{s.w.l.} = \int_{0.83}^{1.0} [D(L) - S(L)]dL = 0.028$$

Again, note that this can be expressed as 2.8 percent of the equilibrium wage payment.

C. THE MILITARY AS A CONSTRAINED MONOPSONIST.

In the case of the constrained monopsonist, the social welfare loss will be less than the area $\alpha\delta\varepsilon$ in Fig. 1 if $w^{***} < w_c < w^{**}$. To begin with, $w^* < w_c$ since the principal result of the volunteer force legislation was to increase substantially the pay of first-term personnel. Although we cannot establish with certainty that $w^{***} < w_c$, such a result seems likely given the magnitude of the pay increase (about 40 percent for first-termers).[1]

To show that $w_c < w^{**}$, we rely on the following indirect line of thought. In particular, if $w_c = w^{**}$, then we know from subsection A of the Appendix that OB (in Fig. 1) equals 0.72. When OB = 0.72, we know from the demand function given by Eq. (2) that $w^{**} = 1.39$. From the supply function given in Eq. (1), we know that supply OD = 1.51 when $w^{**} = 1.39$. Therefore, the ratio of supply to demand when $w_c = w^{**}$ equals OD/OB = 2.10 which, when translated, means that the military would be facing an excess supply of 110 percent if $w_c = w^{**}$. Since this does not seem to be the case, we can conclude that $w^{***} < w_c < w^{**}$, so that the social welfare loss under the volunteer force is less than the area $\alpha\delta\varepsilon$ in Fig. 1.

[1] If $w^{***} < w^*$, then we can show with certainty that $w^{***} < w_c$ since $w^* < w_c$. Alternatively, if $w^{***} > w^*$, then we can only assume that the pay increase was sufficiently large such that $w^{***} < w_c$.

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