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THE DRAFT VERSUS AN ALL-VOLUNTEER FORCE: ISSUES OF EFFICIENCY AND EQUITY IN THE BELGIAN DRAFT

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This paper considers the choice of labour inputs in the production of Belgian defence. The social costs and the distributive aspects of the selective conscription of males and an all-volunteer force are analyzed. First, theoretical arguments on the efficiency and equity of both manpower systems are spelled out. Next, estimates for the social costs of the conscription and an all-volunteer force are presented. Finally, casual evidence concerning the equity of the draft is presented.

KEY WORDS: Military manpower, draft, all-volunteer force, allocative efficiency, equity.

INTRODUCTION

In this paper we consider the choice of labour inputs in the production of military defence. More precisely, we analyze the social costs and the equity of the current Belgian selective conscription of males by comparing it with one alternative, an all-volunteer force (henceforth AVF).[1]

Since Belgium is an ally of NATO and since safety is a public good, albeit imperfect, for the members of a supranational alliance (Murdoch and Sandler, 1984), we assume that the defence output is exogenously determined. We also assume that both manpower systems are able to provide any safety level chosen. Hence both systems yield the same social benefits. Therefore we can concentrate on estimating the differences in social costs. Furthermore, the analysis is confined to peacetime defence. During wartime it is difficult to rely on volunteers only. Note finally that we do not consider the problem of transition from one regime to another in neither war- nor peacetime (see e.g., Withers, 1972).

Analysing the choice of labour inputs in the production of defence raises questions both on its efficiency and equity. Firstly, the draft constrains the allocation of labour forces between the military and the civil sector. Therefore, it can be studied from the

[1] An AVF is not the only alternative. The choice of labour inputs for defence was debated in the U.S.A. during the Vietnam era: see Burk (1989), Fisher (1969), Folsom (1984), Hansen and Weisbrod (1967) and Oi (1967). Amacher *et al.* (1982) provide an excellent survey. On European conscription policies: Mellors and McKean (1984).

viewpoint of economic efficiency. Secondly, financing defence—as any public good—creates free rider problems. This problem is overcome by forcing civilians either to pay taxes in cash or in kind. This raises the issue of justice in financing this public good.

The paper is structured as follows. In the second section the theoretical consequences of a draft and an AVF are spelled out both from the efficiency and distributive point of view. The estimates for the social costs of both the conscription and an AVF are developed in the next section. Furthermore, some casual evidence concerning the equity of the current draft is presented. The final section discusses some consequences for public policy.

THE DRAFT VERSUS AN ALL-VOLUNTEER FORCE: A THEORETICAL ANALYSIS

Efficiency Effects

The draft results in allocative inefficiencies in exchange and in production. The first point is obvious. The draft selects people irrespective of their job preferences and rations their time allocation. Hence under alternative arrangements Pareto improvements are possible. Allocative inefficiencies in production occur whenever production units opt for an erroneous input mix relative to the adequate input prices.

A selective draft affects allocative efficiency in the military sector since it cheapens the labour cost of both the draftees and the volunteers. On the one hand, draftees are forced to offer some legally defined amount of labour for a fixed price. On the other hand, the introduction of a draft reduces the labour demand for volunteers. This results in a lower volunteers' pay. In addition, part of the volunteers are draft-induced—i.e., they serve voluntarily because they belong to the draft-eligible population, but they would not volunteer otherwise at the wage rate for volunteers in the absence of the draft (see Bradford, 1968 for a theoretical analysis).[2] This additional supply of volunteers further lowers wages. The combined effect is that a production is chosen which is too labour intensive. In an AVF labour is more expensive and production is less labour intensive (Fisher, 1969; Hansen and Weisbrod, 1967). This raises the question of the appropriate shadow price of labour in public production when labour is rationed by a draft.

In a full employment economy draftees should at least be valued at their wage rate in the civil sector. If preferences towards military careers differ, then the reservation wages consistent with providing the required number of men are more appropriate (Amacher, *et al.*, 1982; Withers, 1972). Also the wage of volunteers underestimates the social value of their labour. It should be corrected for both the effects of reduced demand and draft-induction.

Unemployment affects the social evaluation of the opportunity costs of the unemployed. Since searching for a job under an unemployment insurance scheme is a productive activity enhancing the job-matching process, it is reasonable to value the unemployed by the unemployment benefits provided. But this only sets a lower bound to their social cost. To determine an upper limit requires focusing on the extent to which public sector labour demand affects the total employment in the

[2] Altman and Fechter (1967), Fisher (1969) and Oi (1967) report estimates on U.S. draft-motivated volunteers.

economy or merely displaces private sector hiring (see Marchand, Mintz, and Pestieau, 1984 for details). An analogous argument defines the range for the shadow price of volunteers, which can diverge from the wage bill.

Finally, note that the draft may affect the output available to society in a variety of other ways. At first glance an AVF would not have these adversary effects.

Firstly, the draft imposes high administrative costs on the public sector. There are the costs of the registration of draft-eligible citizens, the costs resulting from the selection, postponement and exemption of eligible persons, etc. Also the private sector bears a part of these costs. For example, Belgian firms pay for draft-eligible workers who attend the selection procedures.

Secondly, the high turnover of draftees results in higher training costs compared with an AVF. Note, however, that even under an AVF it is necessary to maintain training facilities for the case of an emergency mobilization. Moreover, in the absence of a draft the turnover rate of volunteers is likely to fall as the draft-induced volunteers opting for short careers drop out. An AVF thus reduces labour turnover and lowers the overall training costs: the same effectiveness with a 5 to 10% reduction in strength is feasible (Amacher *et al.*, 1982; Withers, 1972). It is likely that the draft also increases training costs in the private sector due to the uncertainties of the draft selection process, both at the level of the draft-eligible population and at the individual level concerning the eligibility status (Hansen and Weisbrod, 1967).

Finally, depending on selection, deferment and exemption criteria the draft-eligible population can alter its behaviour to obtain characteristics necessary to avoid or defer the draft: marital status, studies, physical and mental health states, etc.

Distributive Effects

Defence is supplied in a fixed amount to all citizens. As for many public goods individual benefits and tax prices need not match. The use of a draft, however, raises rather special issues. Some citizens are forced to produce the public good and hence pay taxes in kind. The others are obliged to pay their taxes in cash. How should these costs of the production of safety be distributed?

Firstly, the draft implies individual costs beyond the period of the draft obligation. It affects the individual age-earnings profiles in the long run negatively because human capital depreciates.[3] If desirable these individual costs can be compensated by either raising the draftees' pay and/or by offering future tax discounts.

Furthermore, cash versus in kind payments affect people's welfare differently. Firstly, the distributive impact of explicit taxes is easier to assess than that of in-kind taxation, because the latter remains largely hidden both from the taxpayers and the government. Note that this can also delude intra-family redistributions aimed at neutralizing the draft burden. Secondly, citizens paying taxes in cash remain free in organizing their lives. Armies have an authoritarian structure seriously restricting the draftees' opportunities to choose. Freedom of choice is an important component in the evaluation of well-being which is neglected in the traditional welfarist format (Sen,

[3] The empirical evidence is mixed. Some studies (Berger and Hirsch (1983); De Tray (1982); Schwartz (1986)) find that veterans earn some premium above comparable non-veterans, but these do not distinguish between draftees and volunteers. Our tentative conclusion is based on one study focussing on draftees only reporting that even lower skilled labour does not benefit from the draft (Cutright (1974)), and one panel study which reveals that white U.S. draftees experience an income loss equivalent to about two years of civilian labor market experience while non-whites are not affected (Angrist (1990)).

1988). Welfarism concentrates on the utility consequences of choices made, disregarding all other information. For these reasons it is difficult to compensate draftees for the rationing of their time allocation. Note that this loss in autonomy also deteriorates the draftee's motivation and hence military effectiveness (Frey, 1992).

Using the welfarist format of normative economics the evaluation of both manpower systems is an empirical matter. A large part of the literature seems to favour an AVF on *a priori* grounds (Amacher, *et al.*, 1982; Withers, 1977 among others). We want to suggest that the selective draft can be re-interpreted with recent optimal tax models which consider quantity constraints as additional government instruments. In a second best world with differences in abilities and preferences it has been shown that optimal tax equilibria can be improved by means of quantity controls. In particular the following general theorem on personalised quotas was proven (Guesnerie and Roberts, 1984). A consumer should be forced to consume more (less) of a good if the demand for that good has been discouraged (encouraged) by the fictitious taxes—i.e., the taxes correcting for the differences between the social values of commodities and the market prices. In this way quantity controls help to minimize the distortions in the economy. If well designed, a selective draft is a policy tool of in-kind redistribution since it reduces the draftees' leisure time. This negative quotum on leisure is optimal if draftees have reduced their labour supply in favour of leisure time as a response to the vector of fictitious taxes.

Note that the draft has some characteristics of a first-best lump-sum tax too (e.g., women are often exempted). But we only intend to offer a new interpretation for the draft selection among the male population. Note also that quantity controls limit individual freedom, but this need not affect the welfarist evaluation of social states.

In addition to vertical equity, the issue of horizontal equity is often raised. It is said that the selective draft violates the notion of horizontal equity: because of its selectivity it does not treat equals alike.[4] In this context we note that a draft lottery, in which one prize is an obligation to serve, provides an attractive alternative. If horizontal equity implies that in a lottery everyone must have the same probability of winning each prize, then a draft lottery is horizontally equitable. Moreover, a draft lottery yields at least the same welfare as an AVF. If people are obliged to specialize completely in a single occupation, lotteries with appropriate prizes may be welfare improving with respect to a competitive solution. The basic intuition is that when the choice set is non-convex, in this case due to indivisibilities in occupational choice, lotteries extend the choice set. Therefore they improve welfare *ex ante* (see Bergstrom, 1986 and Stiglitz, 1982), although not *ex post* (Amacher, *et al.*, 1982).

One objection against a draft lottery is that correcting mechanisms (e.g., markets for lottery prizes) are likely to emerge resulting in the rich buying themselves out while the poor have no choice but to serve. However, this objection is fundamentally about the initial wealth allocation, hence about vertical equity. In addition, a lottery can be organised in a way which prevents the existence of these markets.

THE BELGIAN DRAFT: SOME EVIDENCE ON ITS EFFICIENCY AND EQUITY

In this section we develop some estimates concerning both the efficiency and the distributive effects of the selective Belgian draft. The emphasis is on the former effects.

[4] Note that the notion of horizontal equity is irrelevant for welfarist normative economics: see Stiglitz (1982).

The subsequent analysis is limited in scope mainly because statistics on the Belgian military sector are scarce. It is therefore impossible to provide estimates for all effects mentioned. Note that it is crucial to keep the distinction between three types of cost in mind: budgetary, individual and social costs. The first are reflected in the budget of public authorities; the second are borne by individuals but need not affect the total available output for society; and the third are the social output effects.

Efficiency Effects

Three main topics are considered. The first is the question of whether in the Belgian case a switch to an AVF would be desirable on efficiency grounds. This amounts to asking for the social costs of both manpower systems. To answer this question we proceed in two steps. We first provide a detailed analysis of the accounting costs of draftees and volunteers. Then these costs are adjusted to derive the social costs. The second topic concerns the impact of the input prices on the allocation of factor inputs. Using a system of factor demand equations we simulate the effect of imputing the social costs of draftees and also of a change to an AVF on the choice of inputs. The third topic is the labour quality of both the draftees and the volunteers.

A budgetary cost analysis of draftees and volunteers

In this section we discuss the budgetary costs. These expenses are an obvious component of the social costs of both ways to procure manpower. In the further analysis the accounting costs of volunteers are assumed to equal their social costs. This provides an upper bound to the social costs of volunteers, since unemployment is likely to push the social cost of public employment below the prevailing public sector wage rate. A detailed analysis for 1982 of the budgetary components is found in Table 1. It was impossible to find the same detail in expenditures for more recent years. These average costs are grouped under the headings of wages, allowances, transfers in kind and administrative costs.[5]

As shown in Table 1 a substantial part of the administrative costs is not borne by the Ministry of Defence but by various public authorities. Furthermore, the allowances and the transfers in kind form about 15% of the volunteers' base pay. Due to this complex pay structure volunteers may underestimate their total monetary compensation (Folsom, 1984). Note that since draftees served for less than a year the reported figures have been adjusted to a yearly basis by the number of draftees necessary to perform one function per year.

However, a transition to an AVF implies a rise in the volunteers' pay. To estimate the social costs of an AVF we need to correct the wage bill of volunteers under a draft. Two problems must be solved. The first concerns the type of volunteer who is substituted for a draftee; the second relates to the estimation of the required change in the volunteers' wage.

To deal with the first problem we make the following assumptions. Firstly, the quality of volunteers currently recruited is sufficient to meet all manpower needs. This is a weak assumption since the additional volunteers substitute for draftees who always function in the simpler jobs. Secondly, a switch to an AVF raises no problems

[5] Note that no marginal cost information is available. We use average costs and therefore assume a constant returns to scale military technology. This assumption is fairly innocent in the case of marginal decisions, but is less appropriate for calculating the social costs of two different regimes.

Table 1 Average budget per draftee and volunteer (1982 BEF)[a]

Budget costs	Draftee	Volunteer
Gross wages:	22952	483000
Allowance: Sub-total	212	34398
--paratroops	95	2595
--long term performances	/[b]	6285[c]
--weekend work	/	4836[c]
--Germany	/	15488[c]
--missions, transport	/	1691[c]
--international organisations	/	229
--redundancy premium	/	3077
--social service intervention	117	197
Transfers in kind: Sub-total	50437	33404
--food	15906	/
--clothing	15525	10135
--housing	/	12905
--furniture	/	340
--removal	/	675
--transport	6621	711
--medical costs	12385	8638
Administration/Training: Sub-total	77497	40019
--training	54010	37630
--selection	4293	2389
--costs of municipalities	4677[c]	/
--costs of districts	129[c]	/
--costs of provinces	1183[c]	/
--ministry of foreign affairs	159[c]	/
--Home Department	13046[c]	/
Total costs	236090[d]	590821

[a]Source: Danau (1984) Het kostenverschil tussen een dienstplichtige en een vrijwilliger voor de Belgische gemeenschal in 1982, Brussel: V.U.B. (licentieverhandeling). [b]/ means not applicable to the category. [c]Estimates of Danau (1984). [d]Column total (151098) multiplied by a correction factor (draftees per function/year): 1,5625 = 365/(271.5-37.9), where 271.5 is the mean length of the military service and 37.9 is the mean duration of the basic training (in days).

concerning reserve troops. Finally, we assume that the volunteers substituting for the draftees are contracted only for short terms. Consequently they are paid a base income. Therefore the volunteers' wage as reported in Table 1 needs correction: the gross base income for volunteers (having no children) was in 1982 about 383000 francs.

Concerning the second problem, to estimate the effect of an AVF on the military wages the supply of volunteers must be corrected for draft-induction. The only data available for Belgium are survey data.[6] To obtain a wage elasticity for the supply of volunteers a supply equation for officers over the period 1957 till 1986 was specified (see Appendix A: available from authors). A partial adjustment model describing the supply of volunteers in response to the real wage was estimated. The implied rise in the wage to substitute for all draftees is about 140000 francs. This figure is obtained after correcting the estimated wage elasticity of 2.18 for a 5% induction rate. In line

[6] Manigart (1985) estimates a 5% draft induction. He notes further that only 25% of all professional military personnel served as a conscript. Note that stated preferences need not coincide with revealed preferences (Fisher (1969)).

with Amacher *et al.* (1982) and Withers (1972) it is further assumed that only 90% of the 41509 draftees must be substituted to guarantee the same effectiveness. Since officers have better job opportunities relative to other volunteers, this estimate provides an upper limit to the required change in the volunteers' wages. The rise in the wage bill could of course be mitigated if a transition period is planned to substitute for all draftees (see e.g., Withers, 1972). In line with our strategy to estimate the maximal impact of a change to an AVF we prefer to ignore the various transition strategies which are possible.

The above solutions to both problems imply that the social cost of substituting a draftee by a volunteer equals 631000 francs. This figure results from Table 1 by replacing the gross wage of volunteers by their base income and adding the estimated wage increase.

The social costs of the draft

These expenditures do not reflect the draftees' value to society. Their earnings in the civil sector provide a better proxy for their social cost. This is a minimal strategy as it ignores their reservation wages for a military career.

In calculating social costs we differentiate between draftees employed and unemployed prior to the draft. For employed draftees the opportunity costs equal their wage earnings. Again pursuing a minimal strategy we assume that these earnings equal the 1982 base incomes for civil servants according to educational requirements. For unemployed draftees we opted to value their opportunity costs in detail. These costs were estimated by the expected duration of unemployment spells per educational category and the eventual complementary employment spells within one yar. These spells were evaluated by, respectively, the unemployment benefits and again the base incomes of civil servants. Expected unemployment spells were estimated by a proportional hazard model (with a Weibull baseline hazard) using unemployment panel data for the years 1980–1985 for the district Halle-Vilvoorde (see Appendix B). Two hypotheses are made on the unemployment benefits received: all unemployed receive the average school-leavers allowance (UB1 = 8710 francs); or they receive the average unemployment benefits paid to the unemployed under 25 (UB2 = 16795 francs).[7]

Social costs have been calculated under two hypotheses. The first is that the civilian opportunity costs substitute for the cash military earnings only, to wit the wages and the allowances (Social cost 1). The second assumes that civilian earnings substitute in addition for food and the costs of the Home Department—i.e., these components of draftees' income not shared with volunteers' wages (Social cost 2).

The opportunity costs and social costs, reported in Table 2, result from averaging the costs of the employed and the unemployed. These costs are respectively weighted by the employment and the unemployment rate in the population aged less than 25. Note again that these costs are a lower bound. Observe that the social cost of the draft is at least twice its budgetary cost. It we compare these social costs with the social costs of an AVF (i.e., the corrected budgetary costs of volunteers) we have a first indication about the feasibility of both manpower systems. Recall that the social costs of young volunteers substituting for draftees are about 515000 francs, and that these can be interpreted as an upper bound. It is clear that the gap between the

[7] RVA (1983) Steekproef, Brussel and own calculations.

Table 2 Average social costs of the draft (1982 BEF)

Educational levels	Opportunity costs		Social cost 1		Social cost 2	
	UB1	UB2	UB1	UB2	UB1	UB2
Primary school	254168	277220	408827	431879	454065	477117
L. trades[a]	267599	290651	422258	445310	467496	490548
H. trades	296009	319061	450668	473720	495906	518958
L. technical	267599	290651	422258	445310	467496	490548
H. technical	307706	326240	462365	480899	507603	526137
L. g. second.[a]	267789	290755	422448	445414	467686	490652
H. g. second.[a]	304169	324069	458828	478728	504066	523966
H. degrees	412433	424333	567092	578992	612330	624230
Weighted mean	307483	327154	462142	481813	507380	527051

[a]L. = Lower; H. = Higher; g. second. = general secondary.

minimal social costs of the draft and the maximal social costs of an AVF is not that wide.

An allocation model for the Belgian army

In this section we estimate an allocation model for the Belgian army. These estimates are used to simulate the effects of changes in relative factor prices and of quantity rationing on the optimal choice of the factor demands.

Assuming that the defence department is faced with an exogeneously determined output level (e.g., fixed by NATO) its behaviour can be described by a cost model. Costs are minimized with respect to the factor inputs subject to the fixed output. We distinguish four inputs: volunteers, draftees, capital goods, and consumption goods. Note that the factor prices are partly determined by institutional factors (e.g., the price of draftees) and partly by the market (e.g., the prices of consumption and capital goods). Note also that the model focuses on determining allocative inefficiencies, but does not allow for technical inefficiency. Postulating cost minimization as an appropriate behavioural goal, the Defence Department can be analyzed using an econometric allocation system (see Appendix C for details). A CBS version of a system of factor demand equations is estimated imposing only the homogeneity restriction (Keller and Van Driel, 1985). The symmetry and negativity restrictions were rejected by the data when tested against the homogeneity variant.

In Table 3 the scale elasticities and the compensated price elasticities are reported (uncompensated price elasticities: Appendix C). The scale effect allows for a change in the attainable output. The compensated price elasticities measure the effect of a price change as one moves in the factor input space along the production isoquant. Observe that capital is a superior production factor, since its scale elasticity is highly positive. Draftees on the contrary seem to be an inferior input. Note further that the demand for draftees increases when the price of capital goods increases, but declines when the price of consumption or the wages of volunteers increase.

Starting from this estimated allocation system, we simulate the impact on the use of factor inputs both from imputing the social costs of draftees and from a transition to an AVF. Table 4 presents simulation results for 1982 for the following scenarios:

(i) Keeping the output target constant, we calculate the changes in the factor inputs

Table 3 Scale elasticities and compensated price elasticities, evaluated at the mean[a,b]

	dlog q_v	dlog q_d	dlog q_c	d log q_k
dlog Q	0.3073	−0.0213	0.5150	3.6330
	(0.1421)	(0.3489)	(0.2781)	(0.6100)
dlog p_v	−0.4253	−0.1852	0.2536	0.9309
	(0.1315)	(0.3222)	(0.2568)	(0.5639)
dlog p_d	0.0331	0.2469	−0.1769	0.1231
	(0.0514)	(0.1263)	(0.1007)	(0.2210)
dlog p_c	0.5749	−0.9985	0.0844	−1.7895
	(0.2406)	(0.5905)	(0.4707)	(1.0334)
dlog p_k	−0.1826	0.9368	−0.1610	0.7354
	(0.1884)	(0.4626)	(0.3687)	(0.8095)

[a]Q = scale; q and p are respectively the quantities and prices of volunteers (v), draftees (d), consumption (c) and capital (k). [b]Standard errors between brackets.

Table 4 Simulations: Alternative scenario's for 1982

Scenario	% change in nominal budget	% change in q_v	% change in q_d	% change in q_c	% change in q_k
(1)	1,626	8,01	−60,47	−42,79	29,77
(2)	23,843	−9,88	−100,00	−19,61	168,66

and in the nominal budget from a rise in the draftees' pay which takes into account their average social costs (see Table 2).

(ii) Rationing the number of draftees to zero, keeping the output target constant, and raising the volunteers' wage to substitute for all draftees, the changes in the factor mix and in the budget are calculated. This simulation of a shift to an AVF requires the use of a rationed version of the CBS allocation system (see Appendix D).

If draftees are valued at their social costs while keeping the output constant, then the change in the demand for draftees drops by 60%. At the same time the demand for capital goods increases sharply and the number of volunteers grows moderately. The demand for consumption goods on the contrary changes negatively. This factor re-allocation increases the nominal budget by only 2%.

In the second scenario the number of draftees is restricted to zero and the Defence Department is again obliged to perform the same tasks. In addition the volunteers' pay is raised to substitute for all draftees by volunteers. In this case the demand for capital goods increases most sharply and the demand for volunteers declines. The latter is the net result of two effects. First, there is the increased demand for volunteers to substitute for draftees, since the rationing of draftees increases their virtual labour costs. Second, there is the reduced demand following the increase in the volunteers' wages. Clearly, in this case the latter effect dominates the former. Once more the demand for consumption goods changes negatively. This switch to an AVF requires a substantial increase in the nominal budget (23%).

Table 5 The schooling levels of draftees, volunteers and non-draftees[a]

Years of schooling	Drafted soldiers	Professional soldiers	Drafted NCO's	Professional NCO's	Working population	Professional army	Non-draftees
Primary school	13.4%	27.8%	2.3%	5.9%	43.9%	21.6%	38.0%
9 years	42.8%	62.6%	18.5%	75.7%	24.6%	64.8%	34.4%
Secondary school	21.6%	8.9%	29.8%	17.1%	19.6%	12.4%	20.8%
Non-university degrees	12.7%	0.6%	27.2%	1.3%	6.1%	1.2%	4.2%
University degrees	9.5%	0.1%	22.2%	0.0%	5.8%	0.0%	2.6%
Mean X	10.55	8.47	12.74	9.40	8.98	8.78	8.87
Variance S	8.58	3.20	6.55	2.23	10.09	3.32	7.58

[a]Sources: Drafted soldiers, Drafted NCO's: MVL (1983) Beschrijvende statistiek van de dienstplichtigen militieklasse 1982, Brussel, 18–19, 74–75. Professional soldiers: Danau (1984), 64–65. professional NCO's, Professional army: Manigart (1985), 187. Working population, Non-draftees: NIS (1978) Sociaal-economisch onderzoek April 1977, Brussel, deel 2: 150.

In short, pricing draftees by their social costs or opting for an AVF both result in a more capital intensive army. There is an indication that especially the current mixed manpower system allocates resources inefficiently from a social point of view. Clearly, the Defence Department ignores the social costs of draftees. However, there is an indication that an AVF has a larger impact on the budget.

Labour quality

An indication of the recruited labour quality is found if the distribution of the levels of education of draftees and volunteers are compared. The draftees' labour quality, as correlated with the distribution of the schooling levels, is higher than that of the professional army personnel (see Table 5). Both drafted soldiers and non-commissioned officers (NCO) are better educated than the corresponding volunteers. The mean difference can be tested to be at least 2 years for soldiers and 3 years for NCO's.

Two qualifications have to be made. Firstly, the distribution of schooling levels in the professional army is significantly lower than in the population. Secondly, the results may be biased due to age cohort effects. But in 1982 draftees were on average 19.7 years old while professional soldiers and NCO's were respectively aged about 29.5 years and 38.5 years.[8] Hence age cohort effects explain only a minor part of the difference.

These results indicate the overqualification of the recruited draftees. This is a further indication of the allocative inefficiencies of the mixed manpower system: the army not only selects too many draftees, it also chooses over-qualified draftees.

[8] Draftees: MVL (1983) Beschrijvende statistiek van de dienstplichtigen militieklasse 1982, Brussel; volunteers: MVL (1987) Statistisch jaarboek, Brussel.

Distributive Effects

Concerning the distributive effects of the draft two questions are central. The first relates to the distribution of the burden between the draftees and the draft-eligible population; the second to the distribution of the burden among the draftees. These effects are empirically assessed in two ways. Firstly, we compare the schooling level of draftees and the potential draft-eligible population to find an indication of who pays for military deterrence. Secondly, the individual costs of the draft and the implied implicit tax rates are estimated.

Draftees and non-draftees: who pays?

The problem of horizontal equity is pertinent as Belgian conscription is very selective: in the seventies about 50% of each male age cohort effectively served (Manigart, 1985). This is lower than the Europeam average of 57% (Mellors and McKean, 1984). Note that women are exempted. Exemptions of men are based on a variety of principles: psychical and physical health conditions, family income, among others. To evaluate the distribution of taxation between draftees and non-draftees we look at the distribution of some income-related characteristic. The only information available on the draftees' earning power is the level of education. We therefore compared their schooling level with that of the relevant male population aged 14 to 24 years (Table 5).

We tested whether there was a difference between the average years of schooling of both samples. The null hypothesis of no difference is rejected: draftees have at least one and a half year more schooling. Thus the draft tends to recruit people skilled above the population average. Note that this result must be interpreted with care. Since the population data cover the draft-eligible ages incompletely, the schooling level in the population is downwardly biased and the difference is over-estimated.

A further test indicates that the variance of the educational level of draftees is significantly higher than the variance of schooling among the relevant male population. Note that the variance of the level of education of the professional army is significantly lower than that of the working population (see Table 5). It is tempting to conclude that the recruitment of the costly professional personnel is much more selective than that of draftees.

Note also that the tax incidence of the draft, defined by the ratio of drafted to eligible men per category, increases monotonously. Hence contrary to the U.S., tax progressivity is not eased by a shifting of the burden (Davis and Palomba, 1968).

As a provisional conclusion the draft is not fully "representative" with respect to the distribution of schooling levels. It selects among the more able citizens, implying a progressive taxation of abilities.

Individual costs of the draft

The individual costs of the draft which we consider are the opportunity costs and the additional costs of unemployment caused by the draft. The opportunity costs have been discussed. We add to these the estimated costs caused by the prolonged unemployment of draft-eligible persons.

The expected prolonged unemployment spell lengths have been estimated for different educational categories while controlling for draft obligations (see Appendix B). The extra spell lengths caused by the draft are reported in Table 6. During this additional spell the unemployed suffer a loss equal to the difference between his

Table 6 Individual costs of the draft for the unemployed in 1982

Educational levels	Extra unemployment spell in months	Extra income loss		Individual costs of the unemployed	
		UB1	UB2	UB1	UB2
Primary school	−2.56	−41971	−21225	62549	180315
L. trades	5.06	90302	49344	194822	250884
H. trades	3.43	71951	44158	176471	245698
L. technical	3.06	54625	29849	159145	231389
H. technical	3.51	79608	56749	233360	288503
L. g. second.	9.14	163343	89667	268663	291644
H. g. second.	5.96	131882	90273	270746	312890
H. degrees	5.52	184993	161918	459297	486306
Weighted average	3.87	93982	68864	246628	304300

normal wage income and the unemployment benefits. Table 6 reveals that the resulting income loss is substantial. Adding this loss to the opportunity costs of unemployed draftees (not reported in Table 2) yields the individual costs for the draftees experiencing unemployment. Draftees unaffected by unemployment in their civil careers bear, in our analysis, only the opportunity costs (see Table 2). Note that draftees are not only confronted with longer unemployment spells but also, despite their above average educational qualifications, have an unemployment rate about twice as high as that in the population.[9]

The implicit income tax rate per level of education is defined as the difference between the individual costs and the military income divided by the opportunity costs. It is the ratio of the income lost due to the draft and the normal civil wage income. For the unemployed we again made two assumptions about the unemployment benefits received. Concerning the wage earnings of draftees one can either consider the cash income only (Implicit tax 1) or add to this the in-kind benefits (Implicit tax 2). For the unemployed we have added the additional income loss because of the draft-induced unemployment spell. The average implicit taxes paid by draftees (Table 7) result from averaging the taxes of the employed and the unemployed, weighted by the employment and the unemployment rate in the population aged less than 25.

These tax rates are extremely high compared with the income tax rates for non-draftees. The average income tax rates in 1982 range from 4.1% for the first decile up to 42.3% for the tenth decile, while the maximum average tax rate for the highest percentile was 53.1%.[10] Tax progressivity was also reported for the U.S. draft prior to 1973 (Davis and Palomba, 1968; Oi, 1967).

But also among the draftees implicit tax rates vary considerably between the different educational levels. Note that casual evidence on war-time draftees reveals

[9] This can be inferred from the category of draftees without profession and provides an upper bound on their unemployment rate: MVL (1983) Beschrijvende statistiek van de dienstplichtigen militieklasse 1982, Brussel.

[10] NIS (1984) Financiële Statistieken, nr. 34.

Table 7 Average implicit taxes paid by draftees in 1982 percentages (%)

Educational levels	Implicit taxes 1		Implicit taxes 2	
	UB1	UB2	UB1	UB2
Primary school	81.96	85.24	42.81	49.34
L. trades	94.61	91.69	57.42	57.45
H. trades	93.66	92.04	60.03	60.85
L. technical	91.44	90.10	54.25	55.86
H. technical	94.49	93.14	62.14	62.63
L. g. second.	101.10	94.99	63.93	60.76
H. g. second.	98.51	95.55	65.79	64.84
H. degrees	101.96	100.61	77.83	77.16
Weighted average	94.69	93.27	61.23	62.07

the same pattern of vertical inequity with respect to the risk of casualties (Berney and Leigh, 1974).

It remains an open question whether the reported implicit tax rates are compatible with the equity considerations implicit in the income tax. Since the draft is a second best policy instrument, a prudent interpretation of the observed tax progressivity is required. A more detailed analysis is beyond the scope of this article.

CONCLUSIONS

In this final section we summarize our main empirical findings. The empirical analysis covered both the issues of allocative efficiency and equity of the draft.

The budgetary cost were calculated and corrected to derive the social costs of both draftees and volunteers. For the draftees a minimal shadow price was calculated while differentiating between the employed and unemployed. For the volunteers we predicted the wage cost in the absence of draftees after correcting for draft-induction. This analysis prepared the ground for the simulations considering the effect on the choice of factor inputs of imputing the shadow price of draftees and the social costs of an AVF. It turns out that in both cases the military production shifts drastically to more capital intensive techniques. This reveals the allocative inefficiency of the current mixed manpower system. An analysis of the recruited labour quality confirms this conclusion: too many and too able men are drafted.

The issue of equity has been studied in two ways. Firstly, a comparison of the educational levels of draftees and non-draftees indicates that the former are better educated. This can be interpreted as an in-kind progressive taxation of talents. This tax progressivity is unaffected by the tax incidence. Secondly, we studied the differences in individual costs among draftees and the resulting implicit taxes. This included the estimation of the hitherto neglected impact of the draft on expected unemployment spells. It turns out that there are large differences between draftees, but all pay implicit taxes much above the observed average income tax rates In view of our interpretation of the draft as a second best policy tool the equity of the observed tax progressivity requires further investigation.

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