Recruiting Effective Soldiers: Comparing Danish Conscripts and Volunteers Deployed to Peace-Keeping and Peace-Enforcing Missions

Paul Bingley[*] and Stéphanie Vincent Lyk-Jensen[†]

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Abstract

Several countries have changed between conscription and volunteer militaries, yet very little is known about the outcomes of conscripts compared with volunteers. Denmark is one of the few countries that recruits conscripts and volunteers for military service and assigns conscripts through a draft lottery—a uniquely informative combination. While deployment to the missions we study was voluntary, we use the initial assignment mechanism to estimate the relationships between recruitment methods and a variety of military and post-military deployment outcomes. We find that conscription improves the deployed intelligence pool compared to a volunteer force. However, the intelligence of deployed conscripts varies more over the business cycle than that of volunteers. Denmark's mixed recruitment method is able to recruit effective soldiers as we find no other significant associations between recruitment method and outcomes while deployed.

JEL Classification: H56, J24, J38, J45

Keywords: Conscription, Military deployment, Volunteers, Army recruitment

[*]VIVE-The Danish Center for Social Science Research, Herluf Trolles Gade 11, 1052 Copenhagen, Denmark, pab@vive.dk

[†]VIVE, svj@vive.dk

Research Highlights:

- We examine the effects of a conscript versus a volunteer force in a single setting.
- We use a mixed initial recruitment of volunteers and randomly assigned conscripts.
- Conscripts' intelligence varies more over the cycle than volunteers' intelligence.
- Recruitment method affects the characteristics of recruits, but not outcomes while deployed.

1 Introduction

Since the end of the Cold War, and especially since the start of the Global War on Terrorism in 2001, many European armed forces have abolished conscription in favour of an all-volunteer force, as they changed their function from mass civil defence to deployment in international operations. However, in recent years, some European countries have reintroduced conscription, with Norway, Sweden and the Netherlands extending conscription to women in 2015, 2018 and 2020, respectively (Persson and Sundevall, 2019). Many countries encounter recruitment challenges as they increase military spending in response to evolving security conditions.

Effective recruitment and retention strategies are especially important for the military, which, due to its distinctive career structure, relies exclusively on internal promotion rather than external recruitment to fill the higher ranks. The military personnel system depends on recruitment to the lower ranks of soldiers and officers because ranks from sergeants to generals cannot be recruited externally from the civilian labour market. Understanding how the recruitment system affects the characteristics and performance of those serving is crucial because of the special nature of military careers.

Competition from civilian employers adds to the military recruitment and retention challenges. In the context of volunteer forces, the number of volunteers was found to be countercyclical in Belgium (Balcaen and Du Bois, 2023), Sweden (Bäckström, 2019), and the US (Ellwood and Wise, 1987; Asch et al., 2010; Simon and Warner, 2007; Warner et al., 2003).[1] Several studies have used changes in the recruitment mode between cohorts to identify the effects of military service on various outcomes.[2] However, differences in the economic conditions between cohorts at the age of potential military service make it difficult to infer the effects of recruitment mode *per se*. By virtue of a system of military recruitment that is a mixture of volunteering and conscription, Denmark can better inform the effects of recruitment mode across the business cycle.

When examining the effects of the recruitment mode, it is also important to consider why soldiers choose to serve. In an influential study of soldiers' motivations for serving, Moskos and

[1] Holcner et al. (2021) find an insignificant relationship between the civilian unemployment rate and the number of volunteers in the Czech Republic.

[2] For example, Bauer et al. (2012) consider labour market outcomes in Germany, Hubers and Webbink (2015) analyse education attainment and wages in the Netherlands, and Grenet et al. (2011) consider earnings for the UK.

Wood (1988) distinguished between institutional motivation — how organisational practices, norms, and values create and sustain a personal sense of obligation, loyalty, and a sense of duty — and occupational motivation — viewing a military occupation similarly to a civilian job. Battistelli (1997) adds a third motivation of self-benefit, often associated with a desire for adventure. Using this trichotomy, studies of service and deployment motivations in the US, Sweden, and Denmark have found support for occupational motivations (Eighmey, 2006), self-benefit motivations (Hedlund, 2011), and a mixture of institutional and self-benefit motivations (Lyk-Jensen and Glad, 2018), respectively. Who serves in the military and who is deployed depends on individual service motivations and selection processes. As soldiers do not constitute a representative sample of the population, it is important to consider self-selection issues when studying the effects of type of recruitment.

Denmark has deployed soldiers to peace-keeping missions in the Balkans, and peace-enforcing missions in Afghanistan and Iraq.[3] While deployment is voluntary, initial recruitment for military service relies partly on volunteers and partly on the random assignment of conscripts. This assignment mechanism is key for understanding the self-selection process.[4] The mixed initial recruitment, combined with comprehensive military data and administrative records, makes Denmark uniquely informative for investigating soldier outcomes by recruitment mode.

Studies of the quality of military recruits find that schooling is a good predictor of general task performance (Warner et al., 2003), Armed Forces Qualification Test (AFQT) scores are a good predictor of performance during military service (Carlstedt, 1999), and the length of service is a good predictor of military effectiveness (Golding and Adedeji, 2007). We measure soldier effectiveness at the individual level using the predictors of performance AFQT scores, repatriations, promotions, and length of service.

Bäckström (2022) studies the relationship between municipal unemployment rates and mean AFQT scores for military volunteers in Sweden, finding the quality of recruits is counter-cyclical – higher local unemployment rates are associated with higher AFQT scores for volunteers. Hence, the effect of competition from the civilian labour market in reducing the number of

[3]The missions in Iraq and Afghanistan were characterised by asymmetric warfare with enemies of lesser military power, whereas the missions in the Balkans were mostly peace-keeping under a United Nations mandate with little direct combat exposure.

[4]In both the US and Denmark, enlisted personnel serving beyond their initial obligation have always been volunteers. During the Vietnam era, US conscripts made up half of the enlisted force Warner and Asch, 2001.

volunteers (Bäckström, 2019) is exacerbated by a reduction in volunteer quality. A limitation of Bäckström (2022) is that Swedish AFQT scores are only observed for volunteers taking assessments. Because AFQT scores are observed in Denmark for all fit-for-service men, regardless of military service status, we can observe self-selection into and out of the military.

To understand the selection process, we use Angrist, Imbens, and Rubin's (1996) distinction of four response types relative to assignment to a treatment—compliers, defiers, always-takers and never-takers.[5] In our context, always-takers are volunteers, never-takers are refusers, compliers serve according to their draft assignment, and we assume there are no defiers. Imbens and Rubin (1997), making the distinction between compliers who are treated and those who are not, introduce the concept of complier weights. Using complier weights from the initial random assignment, we can compare background characteristics, the cyclicality of AFQT scores, and the military and civilian outcomes of volunteers and conscripts.

We find that the intelligence pool of men who serve is counter-cyclical and is driven not by the selection of volunteers into the military, but by the selection of never-takers with lower AFQT scores out of the military in periods of high unemployment. While conscription improves the intelligence pool for the deployed, the intelligence of deployed conscripts varies more over the cycle than the intelligence of deployed volunteers. Although we find no significant associations between the mode of initial recruitment and outcomes while deployed, volunteers are less likely to remain in the military after deployment, and their exits are pro-cyclical. After deployment, leaving the military for education is counter-cyclical.

Our novel use of complier types allows us to identify how volunteering and refusing to serve change over the business cycle to affect the intelligence pool of serving and deployed men, their outcomes while deployed, and subsequent outcomes. We contribute to four strands of literature. First, many studies analyse the effect of military service or deployment on subsequent individual outcomes by employing identification strategies that purge the sample of self-selection into the military. Identification of service effects comes from changes in conscription – its introduction or removal – or the nature of the conscription process, where draft lotteries provide exogenous

[5]The four response types are: First, some individuals consistently follow instructions, referred to as "compliers." Second, in contrast, some will always act contrary to what is directed, referred to as "defiers." Third, some individuals will receive the treatment no matter the instructions, referred to as "always-takers." Fourth, regardless of the instructions, others will never receive the treatment, referred to as "never-takers."

variation within cohorts.[6] During the Vietnam War, Australia and the US deployed a mixture of conscripts and volunteers, and studies have used draft lotteries to provide exogenous variation in the deployment probability *per se* to identify causal effects free from selection (Siminski and Ville, 2011; Angrist, 1990).[7] To better understand how selection processes affect the pool of recruits and their outcomes, the contrasts between volunteers, compliers and refusers become central to our analysis.

Second, our results speak to the merits of conscription and volunteering in a mixed recruitment system regarding the quality of recruits. While the advantages of military conscription over an all-volunteer force have long been debated (Franklin, 1818; Friedman, 1962), one advantage of a mixed recruitment system is that it broadens the recruitment pool and ensures a stable number of recruits (Gates et al., 1970). The choice is often not between an all-volunteer force and an all-conscript force, since officers and enlisted personnel who serve beyond their initial commitment have always been volunteers, and even at the height of the Vietnam War, draftees made up only about half of the enlisted force (Warner and Asch, 2001). A more relevant choice is between an all-volunteer force and a mixed force of volunteers (some draft-induced) and draftees. The Nordic countries have this mixed system, but Denmark is the only country using a lottery to assign men for initial recruitment. Denmark therefore offers a unique opportunity to compare volunteers and conscripts.

Third, we contribute to the literature on the civil-military gap in terms of values (Janowitz, 1960) and characteristics of the personnel (Huntington, 1957). Among those who are fit for service, men who serve grew up in families with, on average, lower socio-economic status than men who did not serve. While the deployed men are positively selected regarding AFQT scores, they are from lower socio-economic status families on average compared to other men who serve but are not deployed. The intelligence pool of the deployed is pro-cyclical. For the US, Carter et al. (2017) find that the proportion of active-duty enlistees from high-income

[6]For example, regarding educational achievements, Cipollone and Rosolia (2007) demonstrate how regional exceptions to the Italian conscription law increased male high school graduation rates by reducing interruptions in their education. Maurin and Xenogiani (2007) found that the abolition of conscription in France led to a decline in the educational levels of young men, as the motivation to remain in school to avoid the draft diminished. Furthermore, Bauer et al. (2014) explore how draft evasion influenced educational enrollment when the draft was introduced in Germany.

[7]Several studies have used the Danish draft lottery to identify the effects of military service on various outcomes. Albæk et al. (2017) and Lyk-Jensen (2018) focus on crime, Bingley et al. (2020) look at earnings, Bingley et al. (2021) analyse behavioural spillovers, and Bingley et al. (2022) focus on skill acquisition.

neighbourhoods increased during 2000-2010. In contrast, Bruhn et al. (2022) find that recent falls in US veterans' well-being are best explained by changes in whom is allowed to serve rather than by the effects of war, with lower AFQT scores and more moral waivers for recruits in the mid-2000s. Comparisons of these results show how large demands on the number of soldiers can affect their quality and profile, thus widening the civil-military gap.

Finally, our findings about the cyclicality of intelligence pool of conscripts and volunteers contribute to the literature on the interaction between the labour market conditions and military recruitment (Bäckström, 2019; Asch et al., 2010). In contrast to previous results, the unique feature of the Danish recruitment system allows us to provide a more complete analysis of the nature of self-selection into the military, as we observe the AFQT score distribution for all eligible men and we can estimate their complier type (Bäckström, 2022). Moreover, we can compare outcomes in a single setting and for a European country, as experiences and lessons from the US on how to overcome the challenges related to an all-volunteer military may not apply to European militaries due to fundamental differences in demographics, social programmes and labour markets (Williams, 2005).

The paper proceeds as follows. Section 2 describes the institutional setting in Denmark. Section 3 presents our empirical approach, and Section 4 describes the data we use. Section 5 presents our results, and Section 6 provides a discussion of them, while Section 7 concludes.

2 Military Recruitment and Training

While conscription has declined among OECD and NATO countries—half of the 24 countries that conscripted in 1995 no longer do so—Denmark has maintained a mixed conscription and volunteer military, following recommendations from Bruun et al. (2003).

Upon turning 18 years, men in Denmark must participate in an Armed Forces Day (AFD), which is a military recruitment event, during which they undergo a variety of tests.[8]

[8]Since 2004, 15–20 percent of recruits have been women (Ministry of Defence Personnel Administration). Because women do not take part in the draft lottery, we focus exclusively on men.

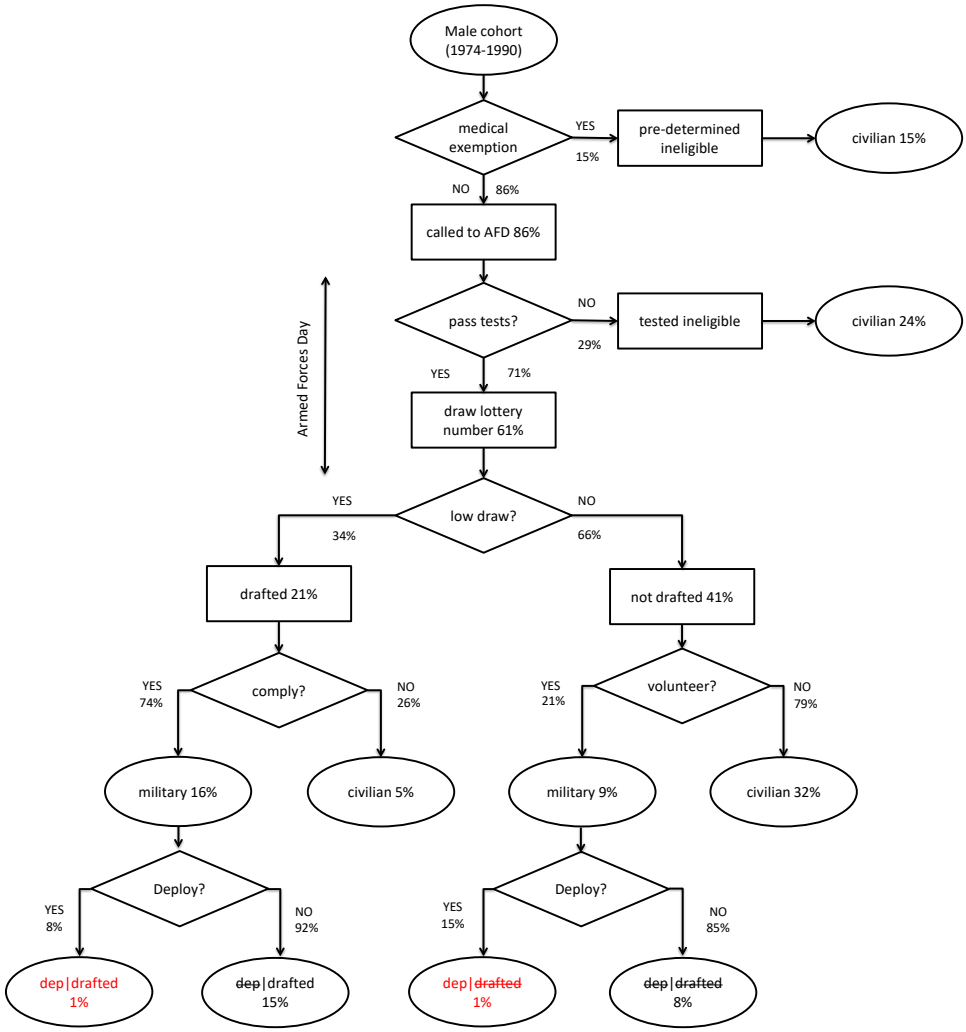


Figure 1: Flow Chart of the Selection Process for Military Service and Deployment.

Notes: Numbers inside the shapes denote average percentages of birth cohorts 1974-90. Numbers beside the arrows denote average percentages for taking each route conditional on reaching the junction. The AFD includes test-taking and drawing lottery numbers. Our data set contains information on all those who drew a lottery number and those who attended the AFD and all the males from birth cohorts 1974-90 subsequently deployed (dep.) on missions. The strikethrough drafted and dep. indicate not drafted and not deployed, respectively.

Each year, about two-thirds of a male cohort are assessed to be fit for military service. These fit-for-service men draw lottery numbers and are given dates when their military service might start. Regardless of the lottery outcome at the AFD, anyone declared fit for service can volunteer to serve; volunteers' preferences for service type and location are prioritised. Every six months, the Ministry of Defence announces a lottery number threshold for the cohort of po-

tential conscripts during that period. Men who draw a lottery number below the threshold are assigned to serve (drafted). About one-quarter of drafted men do not serve in the military because of subsequent poor health, criminal convictions, or conscientious objections. Therefore, we also consider the service status independently of the draft status.

After completing the mandatory military service, eligible men can continue in the military and sign a contract to be deployed on missions. As military capacity is limited, not all men who want to sign up necessarily obtain a contract. Although men sign a contract voluntarily, they cannot volunteer for a deployment to a specific country. Between 1994 and 2010, 7,000 men on average performed their military service each year. From 1992 to 2009, about 2,000 to 4,000 soldiers were deployed on international missions annually. These soldiers sign contracts of varying lengths. Figure 1 illustrates the selection process before deployment and shows that two percent of men from cohorts born between 1974-1990 have been deployed.

Since the 1990s, several changes have occurred in recruiting soldiers and the types of missions they are deployed on. The missions have changed from being mainly peace-keeping to peace-enforcing. Deployments and engagements in combat situations have become a norm for Danish soldiers. From 1994 to 2005, the Danish International Brigade was a peace-keeping force that offered soldiers a three-year contract for international missions. Most soldiers deployed during 1994-2009 were recruited through these contracts.

Since 2005, the recruits have undergone basic Army training (Hærens Basisuddannelse, HBU) for four months.[9] After completing the HBU basic training, soldiers can apply for the eight-month Army Reaction Forces Training (Hærens Reaktionsstyrke Uddannelse, HRU).[10] This training constitutes the foundation for later deployment, and deployments typically last six months. During HBU, the military group leaders evaluate the soldiers who want to continue in HRU (informal screening) and can reject some candidates. Soldiers are also screened during the HRU to see if they react as expected and to check their physical ability. The intensity and extent of the screening differ according to the personnel groups—privates, non-commissioned

[9]HBU standard training includes several modules: basic military education, field training, fire training, combat training, service in civil society (environment tasks or rescue techniques), and an introduction to peace-keeping operations. The basic military training enables soldiers to operarate in dangerous environments, administer first aid, operate handguns, and use other equipment and supplies.

[10]HRU training encompasses 34 training weeks, including fire training for handguns and light machine guns. Afterwards, there is unit-related training in the platoon and the company, including several days in the shooting camp, where the focus is on cooperation between the different weapon types.

and regular officers. While HRU prepares soldiers for deployment to international military missions as privates, officers tend to bypass HRU, going straight to a military training college for four years. Importantly, only personnel who volunteer for deployment can be deployed.

From 2006, the media reported extensively on increased numbers of wounded and killed Danish soldiers in Afghanistan, highlighting the danger associated with these missions. The financial crisis worsened civilian job opportunities in Denmark, especially for the young and unskilled, making an army career relatively more attractive to this group. The media coverage and the crisis likely influenced military recruitment, making a military career more appealing for some and less appealing for others.

As described by Tresch et al. (2008), the main purpose of drafting young men is to provide the army with a natural reservoir for voluntary commitments. In 2008, the military authorities estimated that they could recruit about 13 percent of the conscripts (those who were not volunteers) through subsequent voluntary applications to join the army and be deployed.[11]

Between 2006 and 2012, the number of deployments increased. In 2007, military service was reduced from about eight to four months. Following political discussions about abolishing the draft lottery, in 2012, the government decided to keep it but to reduce the number of conscripts from about 5,000 to 4,200. By retaining the draft lottery, the military can draft more conscripts if economic conditions change and fewer people volunteer.

3 Empirical Strategy

Because of randomisation, draft status is independent of response type (always-takers, compliers, never-takers), and we can calculate the population frequencies of each response type.[12] While we know that everyone who is not drafted but serves is an always-taker, the remaining always-takers cannot be identified individually because they are mixed with serving compliers among those who are drafted and serve. In a statistical sense, even though we do not know which individuals are compliers, we can describe them using a probability weighting scheme. The always-takers group consists of individuals we can identify with certainty and others for

[11] Memorandum on increasing the annual number of conscripts [Notat om Forøgelse af det årlige antal værnepligt], Defence Commission of 2008, 26 January 2009.

[12] Appendix Table A.1 shows the relation between draft status, service status and complier types.

whom we can estimate the probability of being always-takers. Similarly, never-takers can be identified among individuals not serving with certainty or an estimable probability.

To characterise volunteers, conscripts and refusers, we need to calculate the expectations of covariates given four response types (always-takers, compliers who serve, compliers who do not serve, and never-takers). We apply the insight of Imbens and Rubin (1997) to estimate these expectations. Appendix B derives the expectations we use for our compliers analysis and elaborates on the response type probabilities for each individual to explain soldier outcomes. Using this probability weighting scheme we can run the following Weighted Least Squares regression with dependent variable outcome indicator P for individual i on the sample of men who serve:

$$P^i = U^{ym(i)}\beta_0 + R^i_{AT}\beta_1 + U^{ym(i)}R^i_{AT}\beta_2 + X^i\beta_3 + \varepsilon^i, \qquad i \in S_1 \tag{1}$$

where S_s is service status with $s = 1$ indicating serving, $U^{ym(i)}$ is the unemployment rate in the year of service y and municipality of residence m for individual i, R^i_r is response type with $r = AT$ indicating always-takers, X^i is a vector of individual characteristics, β_0 through β_3 are associated coefficients and ε^i is an error term. We can interpret a positive β_0 as an indicator for a counter-cyclical outcome measure — the higher the unemployment rate, the worse the outcome. β_1 indicates how volunteers perform compared to compliers who serve, and a positive β_2 indicates the outcome measure for always-takers is more counter-cyclical than for compliers who serve. We can run similar regressions to explain the outcomes of deployed men, using the unemployment rate in the year of deployment and the municipality of residence. Analogous to the regressions explaining outcomes while serving, we can run regressions using probability weights for never-takers to explain the outcomes of men who do not serve.

4 Data

Military records contain information on the population of fit-for-service men and on the population of deployed men. The AFD data set includes the AFQT scores for men born between 1974 and 1990.[13] For men deployed on missions 1992-2012, military personnel records contain

[13] We denote by AFQT the Børge Prien-Prøven, i.e., the Danish Armed Forces Qualification (intelligence) Test. The test has been used since 1957. See Teasdale (2009) for psychometric properties of the Børge Prien Pr/ove and

rank, type and location of mission, and whether the soldier was repatriated before the end of the mission and why. Unique civil registration numbers allow us to link the military records to a range of socio-demographic characteristics in the general administrative registers curated by Statistics Denmark.

We consider men deployed for peace-keeping missions in the Balkans and peace-enforcing missions in Afghanistan and Iraq, and use AFQT scores, length of service, reasons for repatriation, and promotion (moving to a higher rank, e.g., from sergeant to sergeant major) to measure individual effectiveness. Using the general administrative registers, we can follow the deployed soldiers to investigate their employment, education, disability and vital status. We use a register-based measure of unemployment that Statistics Denmark compiles at the municipality and year level and match this to the municipality of residence in the year of (potential) service or deployment.[14]

a review of its applications. Mortensen et al. (1989) show that the Børge Prien Prøve is correlated 0.82 with the Wechsler Adult Intelligence Scale.

[14] A reform of local government administration reduced the number of municipalities from 271 to 98 in 2007. Until 2006, we use unemployment as a percentage of the labour force. From 2007, we use full-time unemployment as a percentage of the labour force.

Table 1: Summary Statistics, Men Born 1974-1990

	Population	FFS	Served	Deployed
No. of brothers	0.7306	0.7244	0.7201	0.7281
	(0.7109)	(0.7055)	(0.7053)	(0.7094)
No. of sisters	0.6917	0.6879	0.6943	0.7118
	(0.6867)	(0.6821)	(0.6839)	(0.6870)
No. of half-siblings	0.4792	0.4464	0.4686	0.5415
	(0.9067)	(0.8775)	(0.8982)	(0.9519)
Mother married	0.7082	0.7285	0.7234	0.6973
Living in urban area	0.2955	0.2933	0.2995	0.3329
Living in rural area	0.1810	0.1805	0.1743	0.1579
Household income at age 15 (1,000 USD)	28.7237	29.3712	28.6415	27.4068
	(14.4072)	(14.5174)	(13.7734)	(11.1300)
Mother with college education	0.2291	0.2499	0.2290	0.2031
Father with college education	0.2345	0.2549	0.2367	0.2183
Mother with high school education	0.4133	0.4252	0.4275	0.4337
Father with high school education	0.4618	0.4699	0.4761	0.4866
Birth weight lowest quartile	0.2759	0.2610	0.2835	0.2982
Birth weight top quartile	0.2405	0.2490	0.2367	0.2308
Standardized AFQT score		0.0000	-0.0062	0.0152
		(1.0000)	(0.9772)	(0.9404)
Height (cm)		180.4585	180.4962	180.4587
		(6.5860)	(6.5263)	(6.5431)
Draft status=1		0.3504	0.6495	0.5163
Service status=1		0.4068	1.0000	1.0000
Individuals	472,851	292,022	118,794	10,131

NOTE.—Means, standard deviations in parentheses. The population covers men born 1974-1990 who are Danish citizens and resident in Denmark on 1 January of the year they turn 18. Brothers, sisters and half-siblings are counts, top-coded at 2, 2 and 3. Urban and rural indicates living in a municipality with the highest or lowest third population density respectively. Disposable income at 15 is equivalised according to the formula (sum of income in the household plus transfers minus taxes)/(1*first_adult+0.7*second_adult+0.5*number_of_children) and deflated to 2018 prices by the CPI and converted to '000 USD at exchange rate 1DKK=0.147USD. AFQT score, height and draft status are observed on the AFD. AFQT scores are standardised for the fit-for-service sample. Service status is observed at the latest in 2010. Birth weight is measured by the midwife. Missing birth weight is due to births outside Denmark. Mother's and father's schooling are observed on 1 January of the year the son turns age 15, and may be missing if parents have no qualifications obtained in Denmark or the parents are unregistered.

Table 1 summarises our data, comparing the population of men born 1974-90 to men assessed to be fit for service, those serving in the military, and men deployed to Afghanistan, the Balkans or Iraq. Compared to the general population, fit-for-service men had two percent higher household income at age 15 and were two percentage points more likely to have college-educated parents. In contrast, men who served are similar to the general population in these respects. However, serving men have 0.6 percentage points lower AFQT scores on average than fit-for-service men. Deployed men are less likely to have college-educated parents and have four per cent lower household income at age 15 compared to the means for all men who serve in the military. The deployed have two percent higher AFQT scores than men who serve on average and one percent higher scores than the average fit-for-service man. Among fit-for-service men, those with lower socioeconomic status are more likely to serve, and those with even lower socioeconomic status are more likely to be deployed.

4.1 Draft Relevance and Randomisation Balance

In a context where volunteering and refusing to serve are allowed, it is important to show whether the draft is relevant to military service. We therefore estimate the effect of draft status on military service status (Appendix Table A.2). Having a lottery number below the threshold and being drafted increases service probability by 54 percentage points, and the effect is highly significant. Moreover, adding control variables has very little impact on the estimated effect of the draft, as would be expected when the draft is balanced on individuals' characteristics. These individuals' characteristics (controls) should only matter for increasing the estimates' precision. Thus, draft status is a very relevant instrument for service status.

To interpret draft assignment as a causal intention-to-treat, lottery draws must be random and unrelated to individual characteristics. A balancing test (see Appendix Table A.3) confirms that the draft is balanced on individuals' observed characteristics, and as expected, no covariates predict the draft status. The F-statistics across all specifications are insignificant (p-values larger than 0.19), and the coefficients for pre-assignment variables are both small and insignificant. These results confirm that the lottery is a balanced random assignment.

4.2 Compliers Analysis

This subsection describes background characteristics by complier type following Imbens and Rubin (1997) in three ways. First, we present descriptive statistics for the deployed by draft status and complier type to benchmark our weighting scheme. This exercise compares a naive definition of always-takers based on non-drafted men who serve with a weighted definition incorporating a proportion of drafted men who serve (those who would have served regardless of the draft). Second, to set the civilian labour market context, we show how recruitment varies over cohorts by unemployment rate and complier type. Third, we present the (probability) distributions of AFQT scores for conscripts and volunteers because opportunity costs of serving have been shown to vary by AFQT score quantile (Bingley et al., 2020).

Table 2: Compliers Analysis - Background for all Men Deployed by Complier Type

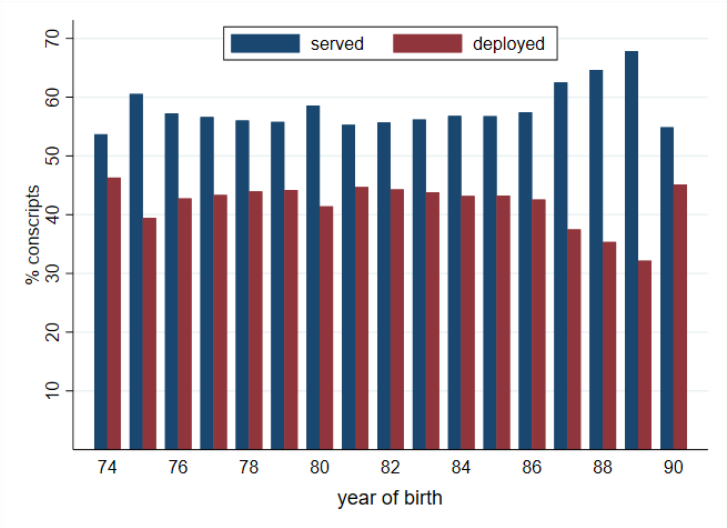
	(1) Drafted served	(2) Not Drafted served (AT)	(3) (1)-(2)	(4) Complier served (C1)	(5) C1-AT	(6) Significance level
Year of birth	1980	1982	-1.569	1979	-3.0652	***
	0.0591	0.0662	0.0882	0.1400	0.1796	
Standardized AFQT score	0.0008	0.0305	-0.0297	-0.0295	-0.0600	
	0.0166	0.0109	0.0195	0.0272	0.0393	
Height (m)	1.8038	1.8054	-0.0016	1.8021	-0.0033	
	0.0009	0.0008	0.0012	0.0019	0.0025	
No. Brothers	0.7180	0.7388	-0.0207	0.6968	-0.0419	
	0.0107	0.0093	0.0138	0.0214	0.0280	
No. sisters	0.7199	0.7031	0.0169	0.7372	0.0341	
	0.0095	0.0099	0.0136	0.0221	0.0275	
No. Of half-siblings	0.5536	0.5286	0.0251	0.5792	0.0506	
	0.0150	0.0124	0.0196	0.0298	0.0398	
Mother married	0.6851	0.7102	-0.0251	0.6596	-0.0506	***
	0.0062	0.0058	0.0084	0.0134	0.0171	
Living in urban area	0.3240	0.3424	-0.0184	0.3052	-0.0372	**
	0.0061	0.0067	0.0088	0.0146	0.0178	
Living in rural area	0.1619	0.1537	0.0082	0.1703	0.0167	
	0.0056	0.0046	0.0069	0.0105	0.0140	
Household income at age 15 (1.000 USD)	26.8549	27.9960	-1.1411	25.6902	-2.3059	***
	0.1511	0.1381	0.2090	0.3250	0.4201	
Birth weight lowest quartile	0.3143	0.2810	0.0333	0.3482	0.0672	***
	0.0060	0.0061	0.0097	0.0154	0.0196	
Birth weight top quartile	0.2254	0.2365	-0.0111	0.2140	-0.0225	
	0.0055	0.0059	0.0086	0.0139	0.0174	
Mother college	0.1835	0.2241	-0.0406	0.1421	-0.0820	***
	0.0056	0.0052	0.0077	0.0123	0.0158	
Father college	0.2059	0.2316	-0.0257	0.1796	-0.0520	***
	0.0067	0.0057	0.0094	0.0142	0.0190	
Mother high school	0.4297	0.4380	-0.0082	0.4214	-0.0166	
	0.0070	0.0066	0.0098	0.0154	0.0199	
Father high school	0.4930	0.4798	0.0132	0.5065	0.0267	
	0.0073	0.0065	0.0107	0.0164	0.0217	
Individuals	5,231	4,900		2,589	10,131	

NOTE.—The population covers men born 1974-1990 who are Danish citizens and resident in Denmark on 1 January of the year they turn 18 and who have been deployed in the period 1992-2012. Columns 1 and 2 split deployed men into whether they were initially drafted or not drafted. Column 4 describes deployed men who complied with the draft using a weighting scheme described in Appendix B. Column 5 presents the difference between compliers and volunteers. Variable definitions are as in Table 1. Means (standard errors). For differences in Columns 3 and 5: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

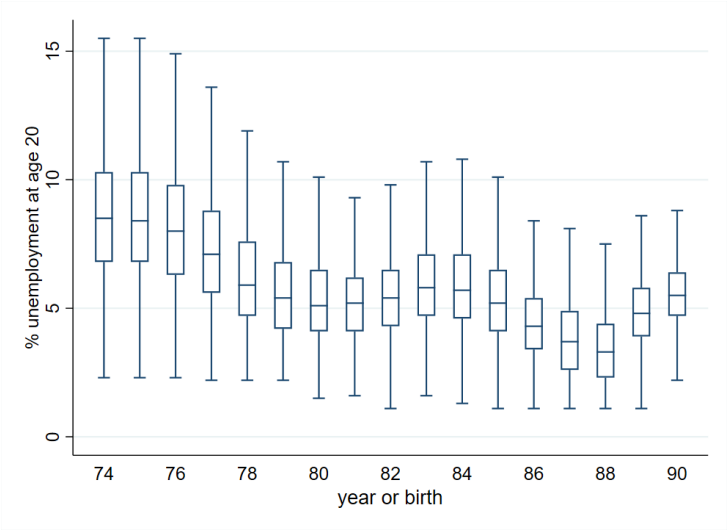
Differences between the background characteristics of deployed men by draft status and complier type are presented in Table 2. The raw data shows differences between the first two columns according to draft status. We know that all men who serve but were not drafted are always-takers (AT, volunteers). However, the column of drafted men who serve contains compliers who serve (C1, conscripts) and some always-takers (AT, volunteers). Hence, calculating the difference between columns (1) and (2) might not be informative about the differences between conscripts and volunteers because of this overlap. To describe conscripts, we need to net out volunteers from draftees who serve by calculating weighted averages (see Appendix B).

As we can see from Column 5 of Table 2 for deployed men, there are no differences in height or AFQT scores. However, deployed conscripts have, on average, lower socio-economic status than deployed men who initially volunteered, with lower birth weight, eight percent lower

household income at age 15, and mothers (fathers) eight (five) percentage points less likely to have a college degree. Appendix Table A.4 shows that among men who serve (but are not necessarily deployed), volunteers have higher socioeconomic status than conscripts. Indeed, serving volunteers have higher socioeconomic status than other fit-for-service men. We have seen that the balanced randomization drafts fit-for-service men evenly by socioeconomic status. The fact that compliers who serve have lower socioeconomic status than other fit-for-service men who serve indicates that never-takers are, on average, from high socioeconomic status households (since together, these two groups comprise all draftees).



(a) Percentage Conscripts by Cohort



(b) Unemployment Rate at Age 20 by Cohort

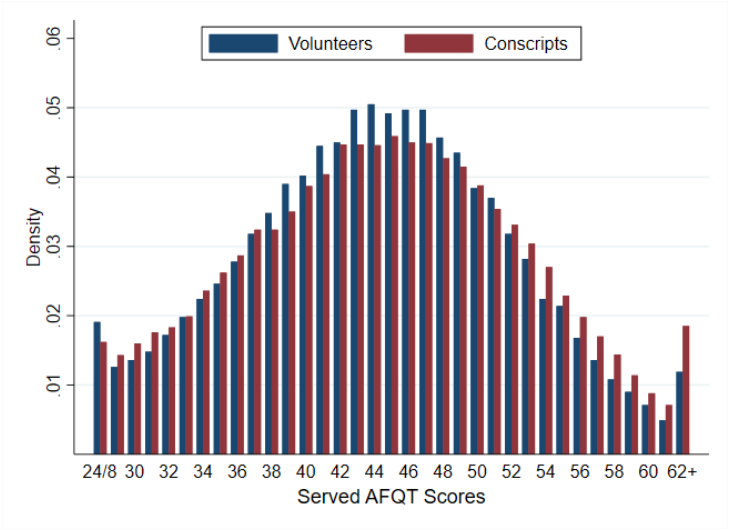
Figure 2: Conscription and Unemployment by Birth Cohort

Notes: Defining conscripts as men drafted into service who would otherwise not have served (compliers), and volunteers as men who would serve regardless of draft status (always-takers). Panel A presents the percentages of men who served and men who were deployed that were initially conscripts. Panel B presents the municipal unemployment rate these men faced at age 20.

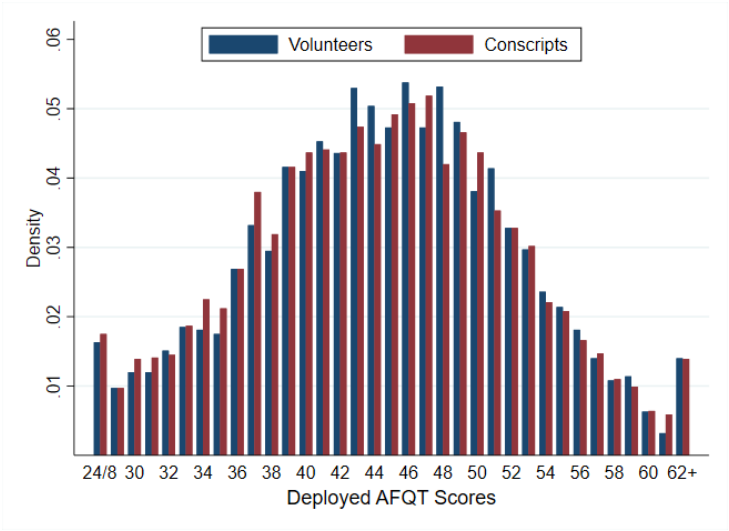
We compute the distribution of AFQT scores for always-takers (volunteers) and compliers (conscripts) by calculating the probability of receiving each raw AFQT score by complier type, and present the probability distribution of raw AFQT scores for men who served in the military in Figure 3a. Scores for conscripts have greater variance and are more likely to be in the top quartile of the distribution. Figure 3b presents a similar split of the raw AFQT score probability distribution for the deployed. These distributions are noisy, reflecting the fact that only a fraction of men who serve are deployed. The variances of deployed scores appear similar by initial

recruitment mode.

Calculating probability weights for compliers by year of (potential) service and deployment,[15] we can infer the percentage of compliers (conscripts) among men who serve and among the deployed. Figure 2, panel A presents these percentages by birth cohort. Conscripts constitute just over half of serving men and just under half of the deployed. This gap is stable at 10 percentage points until 1986, but widens to 30 percentage points by 1989. Volunteers constitute a falling share of men who serve but a rising share of the deployed for recent cohorts.



(a) At Military Service



(b) At Deployment

Figure 3: AFQT Scores by Initial Recruitment Mode

Notes: Distributions of AFQT scores are split into conscripts (compliers) and volunteers (never-takers) according to the weighting scheme described in Appendix B. Expectations are calculated for individual scores in the range 29-61; scores outside this range are pooled. A score of 24 was a minimum requirement for fit-for-service status in our sample.

[15] See Appendix Equation (A.5).

Conditions in the civilian labour market reflect the opportunity costs of military service (Angrist, 1998). Figure 2, panel B shows the local unemployment rate faced by our cohorts when they were aged 20. High civilian unemployment rates when the earlier cohorts served, followed by a secular decline in unemployment across later cohorts, suggest that fewer civilian opportunities for the early cohorts might have driven compositional changes in the recruitment base.[16]

5 Results

While conscription widens the recruitment base (by broadening the intelligence pool of recruits) compared to a volunteer force, this wider base at recruitment does not carry through to deployment. These differences in AFQT score distributions by mode of recruitment motivate regression analyses controlling for alternative civilian labour market opportunities to understand better the consequences of recruitment on the intelligence pool of recruits, and their deployed and civilian life outcomes.

5.1 The Intelligence Pool for Service and Deployment

This subsection examines the relationship between civilian labour market opportunities and the AFQT scores of conscripts and volunteers. Columns 1 to 3 of Table 3 present unweighted estimates, reflecting the observed drafted-served dichotomy. They do not account for the fact that some never-takers might not have been drafted, while some always-takers might be drafted (but would have served anyway). In contrast, Columns 4 to 6 present estimates weighted to account for this mismatch. Column 4 of Table 3 shows the association between the local unemployment rate, complier type, and AFQT scores for men who do not serve in the military. Among these men, never-takers have four percent of a standard deviation lower AFQT scores than compliers who do not serve. While the unemployment rate in the year of potential service is unrelated to AFQT scores on average, for each percentage increase in the unemployment rate, never-takers have three percent lower AFQT scores. As unemployment increases, never-takers display lower AFQT scores.

[16]Earlier cohorts were more likely to be deployed to the Balkans and Iraq, and later cohorts to Afghanistan.

Table 3: Initial Recruitment and AFQT Scores

	(1)	(2)	(3)	(4)	(5)	(6)
		Unweighted			Weighted	
	Served=0	Served=1	Deployed	Served=0	Served=1	Deployed
Unemp. rate	0.007	0.003	-0.118***	0.008	0.004	-0.126***
	(0.009)	(0.009)	(0.037)	(0.007)	(0.007)	(0.029)
Never-Taker	0.072***			0.040***		
	(0.024)			(0.014)		
NT * Unemp.	-0.054***			-0.028***		
	(0.007)			(0.004)		
Always-Taker		0.064***	-0.138**		0.039**	-0.175***
		(0.021)	(0.064)		(0.015)	(0.046)
AT * Unemp.		-0.012**	0.037**		-0.007	0.045***
		(0.006)	(0.017)		(0.004)	(0.012)
Mean AFQT Score	0.026	0.010	0.038	0.034	0.008	0.034
Mean Unemp.	5.683	6.206	5.519	5.707	6.149	5.510
R^2	0.021	0.014	0.053	0.020	0.014	0.054
Observations	173,228	118,794	10,131	173,228	118,794	10,131

NOTE.—The Table presents estimates from separate OLS regressions in each column with the dependent variable AFQT score. Columns 1 and 4 consider fit-for-service men who do not serve in the military; columns 2 and 5 consider men who serve in the military; columns 3 and 6 consider deployed men. Columns 4-6 present weighted estimates, accounting for the fact that some drafted men would have volunteered and that some non-drafted men would not have served if drafted. Covariates are municipality unemployment rate in the year of potential service, actual service, or deployment, respectively, binary indicators for never-takers, always-takers, and interactions with the unemployment rate. Other covariates not shown are dummies for birth cohort, year of potential service, actual service or deployment, and municipality of residence. Standard errors clustered by the municipality are in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Among men who serve, Column 5 of Table 3 shows that volunteers (always-takers) have four percent of a standard deviation higher AFQT scores than conscripts (compliers who serve). The local unemployment rate in the year of service has no association with AFQT scores on average, and volunteers and conscripts have similar AFQT scores across unemployment levels. Taken together, the estimates in Columns 4 and 5 show that volunteers have higher AFQT scores than conscripts. The unemployment rate in the year of (potential) service is only relevant for never-takers, where higher unemployment is associated with lower AFQT scores. The intelligence of the pool of never-takers is pro-cyclical. To the extent that AFQT scores reflect the opportunity costs of civilian employment alternatives, only never-takers react to these alternatives, whereas volunteers do not.

Among deployed men, Column 6 of Table 3 shows that AFQT scores are 13 percent of a standard deviation lower for each percentage increase in the local unemployment rate at the time of deployment. Men who initially volunteered have 18 percent of a standard deviation lower AFQT scores than deployed men who were conscripts. However, initial volunteers have five percent of a standard deviation higher AFQT scores for each percentage increase in unem-

ployment. These results for deployed men contrast sharply with those who serve in the military but do not necessarily go on to be deployed. The intelligence of the pool of deployed men is pro-cyclical, especially for compliers.

Overall, Table 3 shows the business cycle affects the intelligence pool of recruits to military service only through selection among never-takers – men who do not serve and would not serve if they were drafted – whereas complier and conscript recruitment is unaffected by the cycle. This result is consistent with the independence of the draft lottery's outcome and the intrinsic motivation of volunteers, both of which are unaffected by the business cycle. However, the intelligence pool of all deployed men responds to the business cycle through selection into missions by men who initially volunteered, especially men who complied with the draft.

Abstracting from the business cycle, the effects on the intelligence pool of men serving due to never-takers selecting out of military service is exactly offset by volunteers selecting into service. However, among deployed men, those who initially volunteered for service have significantly lower intelligence on average than those who complied with the draft. Hence conscription improves the deployed intelligence pool compared to a volunteer force, although the intelligence of deployed conscripts does vary more over the cycle than the intelligence of volunteers.

5.2 Deployed and Civilian Outcomes

This subsection examines the relationships between recruitment mode, local unemployment and deployment and civilian outcomes. Table 4 shows the association between the mode of initial recruitment, the local unemployment rate in the year of deployment, and military outcomes for the deployed. We find an association between repatriation for mental health reasons and the unemployment rate, which is pro-cyclical. While these reports are uncommon (less than one percent of the deployed), local unemployment can explain a large share. This negative relationship between unemployment and repatriation for mental health problems could be related to the fact that the intelligence pool of deployed personnel is pro-cyclical. Thus, deployed soldiers may be more resilient in periods of high unemployment, as higher AFQT scores protect against the development of mental disorders (Lyk-Jensen et al., 2016).

Table 4: Initial Recruitment and Military Outcomes for the Deployed

	(1) Repatriated All	(2) Repatriated Health	(3) Promoted	(4) Military 2 Year Later	(5) Militarý 4 years later	(6) Military 6 years later
Unemp. rate	-0.002	-0.003**	0.002	-0.006	-0.004	-0.005
	(0.002)	(0.001)	(0.003)	(0.006)	(0.006)	(0.006)
Always-Taker	0.002	-0.002	-0.008	-0.128***	-0.111***	-0.082***
	(0.007)	(0.003)	(0.011)	(0.020)	(0.020)	(0.019)
AT * Unemp.	-0.000	0.000	0.002	0.019***	0.017***	0.013***
	(0.001)	(0.000)	(0.002)	(0.003)	(0.003)	(0.003)
Mean Dep. Var.	0.028	0.007	0.091	0.578	0.438	0.329
Mean Unemp.	5.510	5.510	5.510	5.510	5.510	5.510
R^2	0.053	0.037	0.111	0.059	0.066	0.064
Observations	10,131	10,131	10,131	10,131	10,131	10,131

NOTE.—The Table presents estimates from separate OLS regressions in each column with the dependent variable specified in the column header. All dependent variables are binary indicators. Columns 1-4 show outcomes during the first deployment; columns 5 and 6 show subsequent military careers. Estimates are weighted to account for the fact that some drafted men would have volunteered. Covariates are the municipality unemployment rate in the year deployment, binary indicators for always-takers, and interactions with the unemployment rate. Other covariates not shown are dummies for birth cohort, year of deployment, and municipality of residence. Standard errors clustered by the municipality are in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

While we find no association between promotion and type of initial recruitment, Columns 4 to 6 of Table 4 show that the mode of initial recruitment is associated with the length of military careers after deployment. Men who initially volunteered for military service are less likely to stay in the military after returning from deployment compared to men who were initially conscripted. Furthermore, the exit of volunteers from military careers is pro-cyclical, reflecting civilian labour market opportunities.

Table 5: Initial Recruitment and Civilian Outcomes After Deployment

	(1) Suicide Attempt	(2) Deceased	(3) Employed	(4) Enroled Education	(5) Unemployed	(6) Disability Insurance
Unemp. rate	-0.005	-0.005	0.008	0.013***	-0.008	0.000
	(0.005)	(0.004)	(0.012)	(0.004)	(0.008)	(0.005)
Always-Taker	-0.006	0.007	-0.021	0.014*	-0.009	-0.000
	(0.009)	(0.007)	(0.021)	(0.008)	(0.013)	(0.008)
AT * Unemp.	-0.000	-0.002	0.008	-0.003	0.002	-0.002
	(0.002)	(0.002)	(0.005)	(0.002)	(0.003)	(0.002)
Mean AFQT Score	0.019	0.012	0.891	0.014	0.039	0.016
Mean Unemp.	5.510	5.510	5.510	5.510	5.510	5.510
R^2	0.047	0.042	0.040	0.047	0.046	0.037
Observations	10,131	10,131	10,131	10,131	10,131	10,131

NOTE.—The Table presents estimates from separate OLS regressions in each column with the dependent variable specified in the column header.All dependent variables are binary indicators. A suicide attempt is a binary indicator if registered after deployment. Columns 2-6 show outcomes in 2019 – our last year of observation. Employed, unemployed, and disability insurance are defined according to primary income source during the year. We distinguish two group of 'probable suicide attempts' (1) a primary psychiatric diagnosis in combination with secondary diagnoses: cutting with sharp objects (S51, S55, S59, S61, S65, S69), poisoning by drugs (T36-T50), (poisoning by non-pharmaceutical substances(T52-T60; (2) a primary diagnosis of poisoning by mild analgesics (T39, T40). Estimates are weighted to account for the fact that some drafted men would have volunteered. Covariates are the municipality unemployment rate in the year of deployment, binary indicators for always-takers, and interactions with the unemployment rate. Other covariates not shown are dummies for birth cohort, year of deployment, and municipality of residence. Standard errors clustered by the municipality are in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5 shows associations between initial recruitment and civilian outcomes after deployment that are only significant for enrolment in education. While volunteers are somewhat more likely to study after deployment than are conscripts, enrolling in education is anti-cyclical for the deployed on average. Education is an attractive civilian alternative for the deployed when there are fewer civilian employment opportunities.

6 Discussion

We examine the effects of initial recruitment as a conscript or volunteer on soldiers' outcomes. Because of Denmark's mixed recruitment method, we can compare the effectiveness of deployed soldiers by initial recruitment mode in a single setting. We measure effectiveness at the individual level using the predictors of performance AFQT scores, repatriations, promotions, and length of service. However, while our predictors of individual performance are only a part of what makes an effective soldier, these individuals, in turn, are only one part of military effectiveness—the ability to produce favourable military outcomes. The organisation of the military in the context of mixed recruits may cause interactions that do not carry over to

all-conscription or all-volunteer forces. Furthermore, while deployments to Afghanistan, Iraq and the Balkans were Denmark's main military missions during our study period, Danish soldiers suffered the highest rate of fatalities per capita among countries deploying soldiers in Afghanistan. Insights from these specific Danish missions are difficult to generalise to deployments elsewhere.

We find that men who served in the military grew up in families with lower socio-economic status than fit-for-service men in general, and deployed men came from even lower socio-economic status families. While serving men have lower AFQT scores than other fit-for-service men on average, deployed men's scores are higher. Results from Bruhn et al. (2022) for the US show that recruits from the mid-2000s had lower AFQT scores and were more likely to have a criminal background as the requirements for enlistment were lowered to attract enough recruits. Denmark's mixed recruitment system may help mitigate a falling quality of recruits when more soldiers are needed.

Bäckström (2019) and Bäckström (2022) examined the relationship between civilian labour market conditions and the supply of volunteers to the military in Sweden, finding, respectively, the quantity and quality of recruits to be anti-cyclical. For Denmark, we find similarly anti-cyclical AFQT scores for men who serve. In our mixed system, we can further distinguish the business cycle's impact by the initial recruitment mode. Conscription improves the pool of deployed intelligence compared to an all-volunteer force. However, the intelligence of deployed conscripts varies more over the cycle than the intelligence of volunteers. These findings are relevant to European countries considering introducing or reintroducing conscription. It is important to know how the Danish military manages to motivate conscripts to sign up for deployment, and a pertinent question is whether, with the end of the missions to Afghanistan and improved economic conditions, new military roles will still be attractive to young people.

Another predictor of soldier performance is the length of service. Warner and Asch (2001) finds that for the US, service was longer on average with an all-volunteer system than with conscription. However, as our results show, civilian opportunities can also influence the length of service. We find that men who initially volunteered for military service are less likely to stay in the military after returning from deployment than men initially conscripted. Moreover, the exit of volunteers is pro-cyclical, reflecting civilian job opportunities. This finding has important

policy implications, showing that despite the volunteers' intrinsic motivation, they are less likely to pursue a military career after deployment. The recruitment selection system faces the difficult task of balancing the military's personnel requirements with individual opportunity costs and preferences, highlighting the need for the armed forces to retain those already in service by adjusting the monetary compensation and benefits.

Biddle and Zirkle (1996) argue that states with larger pools of healthy, mentally and physically capable people should tend to field militaries that are better prepared to operate sophisticated weapons or employ complex tactics. Despite the differences in characteristics and AFQT scores by recruitment mode, we find no other differences in outcomes while deployed. Because the critical factors in having effective armed forces are having enough personnel enlisted at the right time and having that personnel be able to do the job efficiently (Golding and Adedeji, 2007), the improved intelligence pool due to conscription is an important feature of a mixed recruitment system that should help face future challenges.

To meet these future challenges, while in 2021 Denmark's public sector workforce accounted for a substantial 28 percent of total employment, with the military accounting for one percent (OECD, 2023), Denmark has committed to spending $21 billion on its military over the next decade, to support military aid to Ukraine and align with NATO's goal that member states spend two percent of their GDP on defense and security initiatives. On 13 March 2024, the Danish government announced a $6 billion increase in military spending, including $1.7 billion to expand conscription by proposing to extend it from four to 11 months and make it compulsory for men and women.

7 Conclusion

Since the end of the Cold War, NATO armed forces have shifted from mass civil defence to international deployment operations. Concurrently, and partly due to these evolving demands, several countries have replaced conscription with all-volunteer military forces. In recent years, the debate has shifted, with many countries considering the reintroduction of conscription to meet staffing needs rapidly.

Despite a long history of variation in how personnel are recruited to the military, there is no

evidence of how conscripts compare to volunteers as effective soldiers in a common environment. To make this comparison, we use the uniquely informative case of Denmark, recruiting a mix of volunteers and conscripts, randomly assigning 300,000 men to serve since the 1990s. While deployment on a military mission is a voluntary choice for soldiers, the initial random assignment allows us to estimate the relationship between the recruitment method (conscript vs. volunteer) and soldiers' outcomes.

Conscription improves the deployed intelligence pool compared to an all-volunteer force, although the intelligence of deployed conscripts varies more over the cycle than the intelligence of volunteers. We find AFQT score differences but no other significant associations between the mode of initial recruitment and outcomes while deployed. Volunteers are less likely to stay in the military after deployment, and their exits from the military are pro-cyclical. After deployment, transitions from the military to education are anti-cyclical.

Taken together, our findings have important implications for military recruitment and retention of personnel by illustrating how the composition of the flow of recruits responds to the economic environment. Nevertheless, motivations and the political environment are also important in determining young people's career choices. Denmark—with its mixture of conscripts and volunteers in the initial recruitment process—has been able to recruit and retain effective soldiers, with no difference in outcomes observed while deployed among conscripts and volunteers. Moreover, during a period of relatively low volunteering for military service, this mixed initial recruitment enabled Denmark to retain and deploy soldiers initially recruited as conscripts.

Declaration of competing interest

The authors declare that they have no conflict of interest.

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Appendix

A Additional tables

Table A.1: Draft status, service status and complier types

	Served=0	Served=1
Drafted=0	Never-takers and compliers	Always-takers and defiers
Drafted=1	Never-takers and defiers	Always-takers and compliers

NOTE.—Fit-for-service men are grouped into four different complier types, each corresponding to two combinations of draft and service status. Always-takers serve and may or may not be drafted. Never-takers do not serve and may or may not be drafted. Compliers serve if drafted and do not serve if not drafted. Defiers do not serve if drafted and serve if not drafted.

Table A.2: Relevance of Draft Status for Explaining Military Service

	(1) None	(2) Basic	(3) Extended I	(4) Extended II
Draft status=1	0.535***	0.539***	0.539***	0.539***
	(0.00165)	(0.00184)	(0.00184)	(0.00184)
Adjusted R^2	0.270	0.298	0.299	0.300
Mean of dep var	0.407	0.407	0.407	0.407
Std dev of dep var	0.491	0.491	0.491	0.491
Individuals	292,022	292,022	292,022	292,022

NOTE.— The Table presents estimates from separate OLS regressions in each column, with dependent variable a binary indicator for serving in the military. Columns differ according to the set of other explanatory variables included. Columns 1 uses no covariates. Column 2 uses a basic specification including year-of-birth dummies, month-of-birth dummies, and quadratic function of AFQT scores. Column 3 uses an extended specification which also includes quadratic function of height and controls for family composition (no. of brothers, no. of sisters, half-siblings), mother marital status, household income when individual age 15, dummies for urban or rural residence. Column 4 additionally includes type of education for mother and father and birth weight top and lowest quartile dummies. Standard errors are in parentheses. All specifications also control for year and month of birth, half-year for service and AFD year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3: Draft Lottery Randomization Balancing Tests

	(1) Basic	(2) Extended I	(3) Extended II
Height (cm)	-0.0061	-0.0061	-0.0062
	(0.0044)	(0.0044)	(0.0044)
Height squared	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
Standardized AFQT score	0.0014	0.0013	0.0014
	(0.0008)	(0.0008)	(0.0008)
Standardized AFQT score square	-0.0003	-0.0003	-0.0003
	(0.0006)	(0.0006)	(0.0006)
No. of brothers		-0.0002	-0.0001
		(0.0012)	(0.0012)
No. of sisters		0.0007	0.0009
		(0.0012)	(0.0012)
No. of half-siblings		-0.0000	-0.0000
		(0.0009)	(0.0009)
Mother married		0.0021	0.0017
		(0.0018)	(0.0018)
Living in urban area		0.0021	0.0021
		(0.0018)	(0.0018)
Living in rural area		0.0050*	0.0051*
		(0.0021)	(0.0021)
Household income at age 15 (1,000 USD)			0.0001
			(0.0001)
Mother with college education			-0.0019
			(0.0023)
Father with college education			0.0013
			(0.0023)
Mother with high school education			-0.0014
			(0.0019)
Father with high school education			0.0021
			(0.0019)
Birth weight lowest quartile			-0.0012
			(0.0020)
Birth weight top quartile			-0.0010
			(0.0019)
F-Statistic	1.4416	1.3615	1.0058
F-Stat p-value	0.2173	0.1913	0.4477
Partial-R^2	0.0000	0.0000	0.0001
Observations	292,022	292,022	292,022

NOTE.— The Table presents estimates from separate OLS regressions in each column, with dependent variable a binary indicator for being drafted. Columns differ according to the set of other explanatory variables included. Column 1 uses a basic specification including quadratic function of AFQT scores and height. Columns 3 uses an extended specification which also includes controls for family composition (no. of brothers, no. of sisters, half-siblings), mother marital status, household income when individual age 15, dummies for urban or rural residence. Column 4 additionally includes dummies for birth weight and type of education for mother and father. All regressions control for year of birth dummies, month of birth dummies, and dummies for half-year of service and AFD year. Standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4: Compliers Analysis - Background for all Men Serving by Complier Type

	(1) Drafted served	(2) Not Drafted served (AT)	(3) (1)-(2)	(4) Complier served (C1)	(5) (4)-(2) C1-AT
Standardized AFQT score	0.0049	-0.0267	0.0316***	0.0179	0.0446***
	(0.0034)	(0.0050)	(0.0057)	(0.0050)	(0.0080)
Height (m)	1.8036	1.8075	-0.0039***	1.8020	-0.0055***
	(0.0002)	(0.0003)	(0.0004)	(0.0004)	(0.0006)
No. brothers	0.7183	0.7236	-0.0053	0.7161	-0.0074
	(0.0027)	(0.0033)	(0.0039)	(0.0038)	(0.0055)
No. sisters	0.6857	0.7101	-0.0244***	0.6757	-0.0344***
	(0.0028)	(0.0036)	(0.0045)	(0.0042)	(0.0064)
No. half-siblings	0.4562	0.4917	-0.0355***	0.4416	-0.0501***
	(0.0032)	(0.0045)	(0.0051)	(0.0046)	(0.0072)
Household income at age 15 (1.000 USD)	28.168	29.516	-1.348***	27.614	-1.902***
	(0.052)	(0.074)	(0.092)	(0.080)	(0.130)
Mother married	0.7266	0.7176	0.0090***	0.7303	0.0128***
Living in urban area	0.2936	0.3105	-0.0169***	0.2866	-0.0239***
Living in rural area	0.1795	0.1647	0.0148***	0.1855	0.0208***
Birth weight lowest quartile	0.3041	0.2453	0.0588***	0.3282	0.0829***
Birth weight top quartile	0.2237	0.2607	-0.0370***	0.2086	-0.0522***
Mother college	0.2272	0.2325	-0.0053***	0.2250	-0.0075**
Father college	0.2382	0.2340	0.0042***	0.2399	0.0059
Mother high school	0.4156	0.4496	-0.0340***	0.4016	-0.0479***
Father high school	0.4722	0.4833	-0.0111***	0.4677	-0.0157***
Deployed	0.0678	0.1177	-0.0499***	0.0473	-0.0704***
Individuals	77,157	41,637	118,794		118,794

NOTE.—The population covers men born 1974-1990 who are Danish citizens and resident in Denmark on 1 January of the year they turn 18 and who have served in the military. Columns 1 and 2 split the sample by whether or not they were drafted. Column 4 describes serving men who complied with the draft using a weighting scheme described in Appendix B. Column 5 presents the difference between compliers and volunteers. Variable definitions are as in Table 1. Means (standard errors). For differences in Columns 3 and 5: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B Compliers analysis calculations

This Appendix shows the calculations made for the compliers analysis, by applying the notation of Imbens and Rubin (1997) to our context. Define service indicator S_s for service status s (taking the value 0 or 1), and draft indicator D_d for draft status d (taking the value 0 or 1). We split the population into response types R_r where $r = NT$ indicates never-takers, $r = AT$ indicates always-takers and $r = C$ indicates compliers. Because of randomisation, D is independent of R and we can compute the population frequencies of these response types. The fraction of men who do not serve among the sub-sample of men who are drafted, estimates the population share of never-takers:

$$\phi_{NT} = P[S_0 \mid D_1] \tag{A.1}$$

The fraction of men who serve among the sub-sample of men who are not drafted estimates the population share of always-takers:

$$\phi_{AT} = P[S_1 \mid D_0] \tag{A.2}$$

The fraction of men who serve among the sub-sample of men who are drafted estimates the combined population share of always-takers and compliers:

$$\phi_{AT} + \phi_C = P[S_1 \mid D_1] \tag{A.3}$$

The fraction of men who do not serve among the sub-sample of men who are not drafted estimates the combined population share of never-takers and compliers:

$$\phi_{NT} + \phi_C = P[S_0 \mid D_0] \tag{A.4}$$

Subtracting (A.2) from (A.3) we obtain the population share of compliers:

$$\phi_C = P[S_1 \mid D_1] - P[S_1 \mid D_0] \tag{A.5}$$

Distinguishing among compliers those who serve, *C1*, and those who do not serve, *C0*,

the expectation of covariates, V, given draft status and service status can be estimated directly. Men who are not drafted and do not serve are a mixture of compliers who do not serve and never-takers, with mixing probabilities the relative proportions of these two sub-populations:

$$E[V \mid D_0 S_0] = \frac{\phi_C}{\phi_{NT} + \phi_C} E[V \mid R_{C0}] + \frac{\phi_{NT}}{\phi_{NT} + \phi_C} E[V \mid R_{NT}] \tag{A.6}$$

Men who are not drafted and serve correspond to always-takers:

$$E[V \mid D_0 S_1] = E[V \mid R_{AT}] \tag{A.7}$$

Men who are drafted and do not serve correspond to never-takers:

$$E[V \mid D_1 S_0] = E[V \mid R_{NT}] \tag{A.8}$$

Men who are drafted and serve are a mixture of compliers who serve and always-takers, with mixing probabilities the relative proportions of these two sub-populations:

$$E[V \mid D_1 S_1] = \frac{\phi_C}{\phi_{AT} + \phi_C} E[V \mid R_{C1}] + \frac{\phi_{AT}}{\phi_{AT} + \phi_C} E[V \mid R_{AT}] \tag{A.9}$$

Inverting equation (A.6) and substituting from equation (A.8) we can express expectations of covariates conditional on complying by not serving:

$$E[V \mid R_{C0}] = \frac{\phi_{NT} + \phi_C}{\phi_C} E[V \mid D_0 S_0] - \frac{\phi_{NT}}{\phi_C} E[V \mid D_1 S_0] \tag{A.10}$$

Substituting from equations (A.1), (A.4) and (A.5) in equation (A.10) we obtain a function of objects that can be estimated directly:

$$E[V \mid R_{C0}] = \frac{P[S_0 \mid D_0] E[V \mid D_0 S_0] - P[S_0 \mid D_1] E[V \mid D_1 S_0]}{P[S_1 \mid D_1] - P[S_1 \mid D_0]} \tag{A.11}$$

Inverting equation (A.9) and substituting from equation (A.7) we can express expectations

of covariates conditional on complying by serving:

$$E\left[V \mid R_{C1}\right] = \frac{\phi_{AT} + \phi_C}{\phi_C} E\left[V \mid D_1 S_1\right] - \frac{\phi_{AT}}{\phi_C} E\left[V \mid D_0 S_1\right] \tag{A.12}$$

Substituting from equations (A.2), (A.3) and (A.5) in equation (A.12) we obtain a function of objects that can be estimated directly:

$$E\left[V \mid R_{C1}\right] = \frac{P\left[S_1 \mid D_1\right] E\left[V \mid D_1 S_1\right] - P\left[S_1 \mid D_0\right] E\left[V \mid D_0 S_1\right]}{P\left[S_1 \mid D_1\right] - P\left[S_1 \mid D_0\right]} \tag{A.13}$$

Hence we have obtained the expectation of covariates given the four response types (always-takers, compliers who serve, compliers who do not serve, and never-takers) as a function of objects that can be estimated directly.

While we know that everyone who is not drafted but serves belongs to the group R_{AT}, the remaining members of the R_{AT} group cannot be identified individually because they are mixed together with R_{C1} among those who are drafted and serve. We know whether each individual i in year y is R_{AT} with certainty, or with an estimable probability:

$$R_{AT}^i = D_0^i S_1^i + \frac{\phi_{AT}^{y(i)}}{\phi_{AT}^{y(i)} + \phi_C^{y(i)}} D_1^i S_1^i \tag{A.14}$$

Similarly, while we know that everyone who is drafted but does not serve belongs to the group R_{NT}, the remaining members of the R_{NT} group cannot be identified individually because they are mixed together with R_{C0} among those who are not drafted and do not serve. We know whether each individual i in year y is R_{NT} with certainty, or with an estimable probability:

$$R_{NT}^i = D_1^i S_0^i + \frac{\phi_{NT}^{y(i)}}{\phi_{NT}^{y(i)} + \phi_C^{y(i)}} D_0^i S_0^i \tag{A.15}$$

Hence, every individual can be classified as an always-taker or a never-taker with certainty or an estimable probability.