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Abstract:

I found no effect of military service on earnings in Britain using OLS. Using the abolition of conscription as an IV, I found that ex-military personnel earn about 20% less than comparable non-veterans. Men from wealthier backgrounds were penalized the most. Using OLS, there was no difference in earnings between former soldiers and those who never served. However, former air force and navy personnel earned more compared to those who did not serve in the military. Using IV to model for selection into the different military branches, there were no statistically significant effects on earnings.

Key Words: Conscription, Military Service

JEL Codes: J3 Wages, Compensation and Labor Costs

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Throughout history, warfare and defence have become less labour intensive because of improvements in technology and changes in the nature of conflict. However, many countries will maintain relatively large armed forces for the foreseeable future because of current and potential conflicts across the world. To ensure that those who serve in the military are rewarded, recognised and cared for by the society that they defend, it is important to investigate the well-being of former service people after they have left the military.

In this paper, I estimated the effect of military service on later earnings. My contribution to the literature on the economic effects of military service is to use survey data where respondents were asked if they had served in the military as a conscript, as a volunteer or not all, and, if they had served, which branch of the military they served in. I controlled for factors such as education, health and socio-economic background which affect both military service and later earnings. Furthermore, I used the exogenous variation in military service resulting from the abolition of conscription in Great Britain to estimate the causal effect of military service on later earnings.

For the majority of military personnel, especially those who are not officers, military careers are relatively short. Most service men and women will need to pursue another career after they leave the military. While some skills learnt during military service (such as a trade or driving) may be "general human capital" that is useful in the civilian world, other skills developed in the military may be "specific human capital" that are not likely to be useful in civilian labour markets.

Furthermore, military personnel may experience stressful and traumatic events during their service and those events may affect physical and/or mental health in later years. Thus, some ex-service people may find it difficult to adjust to civilian life and it might be necessary to design policies to improve their wellbeing. On the other hand, there might be beneficial effects (for instance, on health or earnings) associated with military service through heightened self-discipline and experience of teamwork.

The effects of military service on civilian outcomes might depend on which branches of the military a person has served in. There may be greater opportunity to learn general skills in the navy and air-force, particularly technical skills learnt through seafaring, aviation and the maintenance of technical equipment. While some roles in the army may provide beneficial experience which is useful in the civilian world (such as catering and logistics), many roles in the army, particular those in the "teeth" corps such as the infantry, armour and

artillery, involve more military-specific skills. Furthermore, soldiers may be more likely to experience trauma, both physical and psychological, in land-based warfare and peacekeeping, whereas sailors and aircrew, although not insulated from the horrors of modern warfare, are usually more distant from frontlines.

It is difficult to estimate the causal effect of military service on later outcomes because of selection issues. Individuals self-select into military careers and the military authorities screen those who apply. To overcome the problem of self-selection into the military, the abolition of conscription of Britain, known as National Service, is used as a natural experiment. I examined the later earnings of a group of men who either were subjected to conscription or born too late to be eligible.

A study of the effects of conscription might also be of policy interest. Whilst the return of National Service is not a serious policy proposal in the UK, studying the National Service era is of interest to policy makers in other countries. The vast majority of European countries either currently have conscription (Finland, Switzerland, Norway for example) or previously had conscription, in some form, during peacetime in the not too distant past (such as France, Spain and Italy).[1]

Using OLS, there was no effect of military service on earnings. However, using IV, I found that ex-military personnel earn about 15% less than comparable non-veterans. Men from better-off socio-economic backgrounds were penalized the most. Using OLS, there was no difference in earnings between men who served in the army and those who did not serve at all. However, men who were in the air force or navy may have earned more compared to those who did not serve in the military. However, using IV to model for selection into military service and assignment to the different branches of the military, there were no statistically significant effects on earnings.

The paper proceeds as follows: Section I is a review of the literature on the effects of military service on earnings, Section II is a discussion of the history of conscription in Britain, in Section III, I describe the dataset used in this study, in Section IV, the results are presented and the discussion concludes in Section V.

[1] Ireland, Malta, Andorra, Liechtenstein and Iceland are the only European countries to have never had conscription.

I. Literature Review

In a highly cited paper, Angrist (1990) used the Vietnam Draft Lottery as a natural experiment to estimate the causal impact of military service on the earnings of veterans. Using data from the US Social Security Administration, he found that white veterans earned 15% less when compared to similar non-veterans about ten years after the time of the draft. However, the data used in that research did not include an indicator of actual veteran status and, instead, relied on Two-Sample IV estimation. To address this issue, Angrist, Song and Chen (2011), using Social Security Administration data which better allows the identification of ex-military personnel, also found a similar sized gap between the earnings of white veterans and non-veterans in the 1980s. Extending previous research on the earnings of Vietnam veterans to more recent times, Angrist and Chen (2011), using micro-data from the 2000 US Census, found that the difference between veterans and non-veterans had disappeared.

Imbens and van der Klaauw (1995) examined the post-military service earnings of Dutch peace-time conscripts. By exploiting the rules that governed the administration of conscription in the Netherlands, Imbens and van der Klaauw found that, compared to similar non-conscripts, ex-conscripts suffered a penalty of about 5% in their earnings, 10 years after their service ended. More recent work by Hubers and Webbink (2015) found that Dutch conscripts still experienced a penalty of 3-4% in earnings more than 18 years after their military service ended. However, in both of these studies of the Dutch experience, the veteran status of the individuals was not observed and the researchers had to rely on aggregate data on the share of cohorts who were conscripted nationally as a proxy variable for an individual's actual military service record.

Not all studies find a negative effect of military service on earnings. Card & Cardoso (2012) found that Portuguese conscripts suffered no penalty and for those who were the least educated, there were positive earnings effects of about 4-5%.

Some other studies found neither positive nor negative effects of military service. Bauer, Bender, Paloyo and Schmidt (2012) examined peacetime conscription in Germany using data which allowed them to identify veteran status. Using the discontinuity in veteran status created by the re-introduction of conscription in West Germany after World War Two, they found no effect of military service on earnings. Siminski (2013) found that there were no

statistically significant effects on the later earnings of Australian men who were drafted during the Vietnam era.

Grenet, Hart and Roberts (2011) is, as far as I know, the only published econometric study of the effect of British National Service on earnings.[2] They examined the labour market outcomes of former National Servicemen in middle age and later life and found, broadly speaking, no effect on labour market outcomes. However, in their study, they did not observe the actual military service record of men in their dataset. The present paper builds on the work of Grenet et. al. by examining earlier labour market outcomes and by using data that records whether the men served in the military, instead of inferring their military service record from their date of birth, and the branch of the military that they served in, as well as controlling for family background effects.

II. National Service in Great Britain

For most of modern history, Great Britain has had fully professional and all-volunteer armed forces. However, men were conscripted into the military during World War One and World War Two. Conscription in Great Britain initially continued after World War Two using war-time legislation until the National Service Act (1948) came into force in January 1949. Call-ups to the military ended in 1960 and the last conscripts left service in 1963.

Conscription was introduced because of shortages of recruits to the armed forces, especially to the army, relative to the manpower needs of the military. Historically, with no major land frontier to defend, Britain's army had been, relative to Britain's power in the world, a small army. British military power had been built using its navy and maintenance of security within the British Empire often relied on locally recruited colonial troops. However, twice in the first half of the twentieth century, UK military authorities had found their land army was not adequately large enough to deal with existential threats from mainland Europe. To avoid repeating the mistakes of the past after World War Two, military planners were determined to have a large enough army to deal with potential conflict with Soviet forces and their allies.

[2] Buonanno (2006) is, as far as I can tell, an unpublished study. He found a negative effect of conscription on earnings using data overlapping with that used in Grenet, Hart and Roberts (2011). However, Buonanno (2006) incorrectly stated that the last cohort to be conscripted was born in 1943.

Also, the UK needed a large military to oversee the end of the British Empire in a way favourable to British interests. Counter-insurgency wars were fought in Kenya, Cyprus, Malaya and in other places to protect British economic interests and, in Kenya, British colonial settlers, and to ensure that post-independence governments of former colonies were friendly to Britain and its allies.

The need for more servicemen came at a time of reduced supply of young men. In Figure 1, we can there was a falling number of births in the 1930s, so the supply of men in their late teens or early twenties in the 1950s was low. The consensus across both major political parties in the UK was that conscription was the best solution to the lack of supply of military personnel. Under the initial post-war legislation, conscripts served 18 full-time. However, in 1950, the service period was extended to two years. After discharge from full-time service, a few weeks of part-time service was required.

All male British subjects[3] aged at least 18 but not yet 26[4], who were ordinarily resident[5] in Great Britain, were required to register for National Service. Around their 18th birthday, men first received a letter ordering them to register for National Service.[6] Compliance with the law seems to have been high. The Ministry of Labour and National Service used records from schools and the National Health Service to locate eligible men. The average male birth cohort size in the 1930s was about 372,000 and the average number of National Service registrations for each cohort was around 298,000, so just about 80% of a birth cohort registered. Given the likely number of deaths before age 18, net migration and volunteers joining as regulars before the age of 18, it appears that the conscription law was widely obeyed.[7]

Once registered, men could apply for a deferment. Deferments from conscription were available to those who wanted to complete an apprenticeship, for those who were

[3] Those with dual nationality could defer registration until aged 21 and then had to choose between waiving their British nationality or registering for National Service.
[4] Medical practitioners were liable for call-up until their 30th birthday so as to take the length of their education into account.
[5] In the early years of National Service, a few thousand men claimed not to be eligible on the grounds of not being ordinarily resident. By the late 1950s, many tens of thousands of men were claiming not to be eligible based on residency.
[6] A small number of young men applied for an early registration after their seventeenth birthday.
[7] A small number of men, less than 0.5% of the total National Service registrations, applied for conscientious objector status. Local Tribunals decided whether to grant conscientious objector status.

studying in higher education or training to be an accountant or lawyer, those carrying out scientific work and for those who were working in agriculture, down the mines or at sea. After registration, or, if after a deferment had been granted, after the deferment had expired, the men were sent for a medical examination. If the men were passed as fit, they were posted to the armed forces.

Figure 2a shows the status of the cohort born in 1930 who had registered for National Service. By the year they had turned 19, about 57% of the cohort had been posted to the forces as either a conscript or a volunteer. Around 17% of the men received a deferment to undertake an apprenticeship, this number fell slightly a year later and was nearly zero once the men turned 21. About 10% of men were given a deferment because they were working in agriculture, mining or at sea. The proportion granted a deferment because of occupation declined slightly as the cohort got older. Only about 2% were granted a deferment to pursue higher education, to work as a scientist or undertake training as an articled clerk (that is an apprentice solicitor or accountant). As deferments expired as the men grew older, more and more men were given medical examinations and those who were deemed fit, were posted to the forces. Ultimately, by the time the men turned 26, 14% were deemed unfit, about 10% were working in the designated occupations and about 75% were posted to the forces.

Figure 2b, 2c, 2d and 2e shows the conscription and deferment status of the 1932, 1934, 1936 and 1938 cohorts. Overall the pattern is the same; deferments which had been initially granted to pursue apprenticeships and higher education expired as the men grew older, and then following the medical examination, the men were either deemed unfit or posted to the forces. However, the percentage of men granted deferments for apprenticeships and education increased in every cohort. For the 1936 cohort, just under a quarter of men were granted a deferment for apprenticeships and about 8% were granted a deferment for higher education and training in the professions. Also, the number deemed to be unfit rose to about one fifth of the 1936 cohort. By the time the men of the 1936 cohort had reached their twenty-fourth birthday, only about two thirds of men were posted to the forces.

Table 1a shows the branch of the military the men were posted to in each year. The number sent to all three forces fell over time. Over time, the army's share of the annual intake rose from two thirds to three quarters. The number of men posted to the navy remained quite low throughout the period of conscription.

An aspect of conscription rarely discussed in the literature are the incentives created for men to volunteer for the armed services rather than be conscripted.[8] After passing the medical, the men could opt to volunteer for a regular engagement. Volunteers received better pay and greater weight was given to their preferences as to which branch of the military they would serve in. However, volunteers had to serve for a minimum of three years as opposed to two years under conscription. From the annual reports of the Ministry of Labour and National Service, it is difficult to estimate the exact proportion of a cohort who joined the forces as regulars because some men volunteered before their 18th birthday when they would have registered for National Service and come under the administrative aegis of the Ministry. However, from Table 1b, we can see for each annual intake of National Service registrations who were posted to the forces, the ratio of conscripts to volunteers for regular engagements fluctuated a little from year to year but averaged around 2.77.

In the left panel of Table 2, we can see the preferences of men for particular branches of the military when registering for National Service, both for those who subsequently volunteered and for those who were conscripted. The Royal Navy was a distant third choice of preference among prospective servicemen. The next most popular choice was the Royal Air Force. About half of the men expressed a preference for the Army.

However, the demand for places in the Royal Navy and RAF was far in excess of the actual manpower requirements of those service branches. In general, the navy restricted their intake to those who had previously served in the Royal Navy Volunteer Reserve, Sea Scouts, Sea Cadets, those with family connections to the navy and certain types of tradesmen. A large number of those who were turned down for the navy expressed a second preference for the Royal Air Force.

By volunteering to serve as regular, a man was more likely to gain entry to their service of choice. The second and third panels of Table 2 show that the overall distribution of postings to the different service branches is closer to the distribution of initial preferences for those who opted to volunteer for service than for those who were conscripted.

Over time, the need of the military for personnel fell for several reasons. For example, most parts of the British Empire had gained independence by the early 1960s. Also, it seemed less likely that there would be a large-scale conventional war with the Eastern Bloc. NATO

[8] In the United States, during the Vietnam War era, the President's Commission on an All-Volunteer Armed Force (1970) estimated that about half of all volunteers had volunteered because of the threat of conscription.

decided not to intervene in Soviet dominated countries such as Hungary and Britain developed her own nuclear deterrent in the 1950s. Furthermore, the Suez Crisis was also a stark revelation of Britain's place in the world in the Cold War. In 1957, a report prepared by the Ministry of Defence, known as the Sandys Review, recommended huge reductions in the size the armed forces. In the 17th of April 1957, the Minister for Labour and National Service, Iain MacLeod, announced in the House of Commons that men born in 1940 were unlikely to be called up.[9] The last conscripts posted to the British Armed forces entered service in late 1960 and left in mid-1963.

It appears that the medical examination, and indeed, delays in carrying out the medical examination, were the main means by which the military could control the size of the intake of recruits. Figure 2e shows that by the time of the last year of call-ups, slightly over one fifth of the 1938 cohort (the last complete birth cohort to be called up) were deemed unfit. Furthermore, by the time the last call-ups took place, 5% of the 1938 cohort were still awaiting their medical. Also about 2% of the 1938 cohort were granted deferments because of economic and social hardship. Slightly less than half of the 1938 cohort were posted to the forces.

III. Data

In my analysis, I used the 1972 General Household Survey (GHS). GHS 1972 is a rare case of a survey where questions about military service are asked alongside questions about labour market activity, demographics and socio-economic background. In GHS 1972, respondents were asked whether the served in the military, in which branch they served and whether they volunteered or were conscripts.

The actual details of military experience are seldom discussed in the literature about the effects of military service. In an ideal world, one would like to know, for example, the exact length of military service, whether the serviceperson was in combat, their function in the military and the rank they attained. Most likely, these data would be held military authorities and it would be difficult, to obtain the necessary permission to merge military records with later earnings data from, for example, tax records. The next best option is to use survey data with some information about military service as well as later earnings.

[9] It transpired that no-man born later than October 1940 was required to be a National Servicemen. A very small number of men born in 1940 opted to become National Servicemen before their 18th birthday.

The GHS was a repeated annual cross-section survey collected from 1971 to 2011. Information was collected at the household and individual level. The main themes of the survey were employment, education, health and housing. Redfern (1974) discussed the early development and design of GHS.

The 1972 GHS was a 0.1 percent sample of private households in Great Britain drawn from the electoral register. The initial dataset contains 12,970 households made up of a total 36,718 individuals. Women were excluded from my analysis because they were not subject to National Service and the number of women who served as volunteers in the military was small.[10] After excluding women, the sample size was 17,783 males of all ages in 1972.

I analysed the data using birth cohorts born a certain number of years before and after the final birth cohort to have been conscripted. Of the 17,783 male observations in the sample, there were 4,579 men born between 1930 and 1949. Year of birth and month of birth were not recorded in the publicly available version of GHS 72. Year of birth was imputed using year of interview (a very small number of interviews took place in late 1971), month of interview and age at last birthday. Therefore, the imputed year of birth and, hence, eligibility for National Service, used throughout my analysis was not correct for some of the observations in the sample.

A small number (twenty-four) of respondents were excluded from the sample because they claimed to have done National Service even though they were born after 1939. According to official records, a tiny number of men born in 1940 served as National Servicemen because they opted for an early registration after the seventeenth birthday. However, in the GHS dataset, some of the men who reported doing National Service were born even after 1940.

A further 403 observations were dropped from the analysis because the respondent did not answer questions about military service. The distribution of age and region of residence of those who did not respond to the military service questions was similar to those who responded. The distribution of socio-economic group and employment status of the responders and non-responders were similar although about a third of non-responders to the

[10] About 4% of women in the sample had served in the armed forces, nearly all as part of War Service during the Second World War. Of the women who served, 46% had been in the Army, 36% had been in the Royal Air Force and about 17% had been in the Royal Navy.

military service questions did not also respond to the socioeconomic and employment status questions.

A further 791 observations were dropped from the analysis because of missing values for key variables used in the analysis. For about 200 of these cases, the respondents were not in employment at the time of the survey and, hence, did not have annual labour income data. For the majority of the remainder of the missing cases, the observations were dropped because of non-response to the income questions or the occupation of the respondent's father, a variable used as an instrumental variable in the analysis. There were 3,369 men in the final working sample.

Table 3a shows the percentage of each birth cohort who did not serve in the military according to the GHS and the official records of the Ministry of Labour and National Service. The percentage of men who say they never served was broadly in line with the official Ministry of Labour and National Service statistics for the birth cohorts subjected to conscription. However, the Ministry of Labour and National Service Statistics only consider those who actually registered for National Service. The some of the GHS respondents might have volunteered for the armed forces before they were 18 when they would have registered for National Service. From the GHS sample, we can see that once conscription was abolished, the percentage of men who never served rose immediately to about 90% and then gradually to about 95%.

Table 3b shows the distribution of branch of military amongst those who did serve. For those born during 1939 or before, the ratio of ex-soldiers to other types of servicemen is lower than the official statistics from the Ministry of Labour and National Service shown in Table 1a. Perhaps this discrepancy is because the official Ministry statistics do not include men who volunteered for the military before they were called up to register for national service and for those who did so, they were more likely to have joined the navy or air force than the army. Indeed, their motivation for volunteering at a young age may have been to secure a posting to the air force or navy rather than the army. For the post-1939 cohort, the percentage of those in the different service branches fluctuates considerably from year to year, this is because the percentage of men born during those years in the sample who were in the forces was quite small (between 5% and 10%). Table 3c shows that for those who did serve, the ratio of National Servicemen to volunteers is 2.5 which is broadly in line with what

one would expect for each cohort based on the official Ministry of Labour and National Service statistics (Table 1b).

Table 4 shows descriptive statistics for the variables used in the analysis broken down by military service branch. Former servicemen earned more than those who never served. Ex-airmen and sailors earned more than former soldiers. However, these ex-servicemen were also older than those who did not serve and, so, might be expected to have earned more because of longer job tenure or work experience. Those who served in the army were less-likely to hold a qualification than those who never served, whereas former airmen and sailors were more likely to hold an academic qualification. The distribution of region of residence at the time of the survey was broadly similar for those who never served, for those who were in the army and for those who served in the navy or air force. There were a few differences, for example, the proportion of ex-sailors and aircrew who lived in East Anglia and the South West is higher than for ex-soldiers and service people. This difference is due to the location of RAF bases in East Anglia and naval bases in South West England.

Figure 3 shows the distribution of educational qualifications by year of birth. Perhaps one might have thought that once the British government announced that conscription was to be abolished, men would have entered education and training so as to gain a deferment in the hope that National Service would have ceased by the time they finished their studies. However, Figure 3 shows that the educational attainment of men born before and after the cut-off for conscription eligibility remained relatively stable.

IV. Results

The following model was estimated:

(1) $Log(Annual\ Labour\ Income_i)=\beta_0 + \beta_1*Ever\ in\ Military_i + \beta_2*Any\ Qualifications_i + \beta_3*Chronic\ Illness_i + \beta_4*Irish\ Heritage_i + \psi*Regional\ Dummy\ Variables_i + f(Year\ of\ Birth_i)+\varepsilon_i.$

In Table 5a, I present the estimated coefficients corresponding to previous military service. This linear model was estimated using different samples of men born before and after the eligibility cut-off. Using OLS, the estimated effect of military service was small in magnitude and not statistically significant. The results shown in Table 5a are from regressions where year of birth enters the model as a simple linear function. However, similar results were obtained using higher order polynomials in year of birth.

For the sake of brevity, the coefficients corresponding to the other control variables are not displayed in the main tables. However, the magnitude and direction of the respective coefficients are in line with what one would expect. The results are available on request.

For example, health may affect both military service and later earnings. The GHS records whether the respondent reports a long standing chronic illness. If we assume that the illness was present at the time of their call-up to military service, men with an illness would have been less likely to have been conscripted.[11] On the other hand, one would expect having a chronic illness to have a negative effect on later earnings.

Another factor affecting both military service and later earnings is whether the man was born outside of Great Britain or whether his parents were. About 7% of the sample reported being born outside of Britain and another 7% reported being British born to parents who were born outside of Britain. Men who arrived in the UK after the age of call-up or after the abolition of conscription did not perform National Service. Those who arrived in Britain during the National Service era had to be resident in Britain for at least two years to be eligible. During the last few years of National Service being in effect, many tens of thousands of men disputed their eligibility on the grounds of residency. The authorities had difficultly in proving residency when the young man's interaction with the British state was limited.

Of those born outside of Britain or with parents born outside of Britain, about 45% were of Irish heritage. For young men born to Irish immigrant parents, it was possible to avoid conscription by being or claiming to be, away from Britain, especially given the proximity of the Republic of Ireland and the existence of family networks in Ireland. However, immigrant status would also matter for later wages. In the early 1970s, labour market discrimination in Britain against immigrants, especially non-whites and the Irish, may have existed, so it was important to control for this factor in the earnings equation.

In general, OLS estimates of the effect of military service on later wages can be biased for a number of reasons. Individuals self-select into the military and the military select from their pool of applicants. Individuals may want to serve in the military for many reasons: adventure, for travel, out of a sense of patriotic duty and, in some contexts, the joining the military can be a route out of poverty. All of these motives may affect earnings in later life and may not be observable to the econometrician nor can a proxy variable be found. The

[11] The illness could have begun after their eligibility for National Service or even as a result of their National Service, but it is not possible to know more about the history of the illness.

military authorities will usually screen potential recruits to find those who are physically and mentally suitable for roles within the military. However, the results of those tests may not be observable to the econometrician examining post-military careers.

The abolition of National Service created exogenous variation in military service. I estimated the effect of military service on earnings using Two Stage Least Squares based on the following first stage equation:

(2) $Ever\ in\ Military_i = \alpha_0 + \alpha_1 * Any\ Qualification_i + \alpha_2 * Chronic\ Illness_i + \alpha_3 * Irish\ Heritage_i + \Phi * Regional\ Dummy\ Variables_i + f(Year\ of\ Birth_i) + g(Year\ of\ Birth_i * Born\ Post\ 1939_i) + \omega_i$.

Where g(.) was a polynomial function of the interaction of year of birth with being born after 1939 (and hence not eligible for National Service). Table 5B shows the estimates of the effect of military service when both f(.) and g(.) were linear functions of year of birth. In that case, the effect of military service is generally negative and between about 10% and 25% per annum. When the sample included those born at least 8 years before and after the cut-off, the estimates were significant at the 5% level and were of large magnitude. However, although not statistically significant, the point estimates for the narrower window around the cut-off were smaller in absolute terms but still negative and of the order of 10%-15%. Table 5b also shows the first stage estimates of factors affecting the probability of being in the military. Essentially there was a downward trend in being in the military by year of birth, a large drop for those born after 1939 and then a flat trend in year of birth for those born after 1939.

Table 5c shows the estimates of the effect of military service when both f(.) and g(.) were quadratic functions of year of birth. Again, when the sample included those born at least 8 years before and after cut-off, the estimates were significant at the 5% level and were of large magnitude. However, when the sample was narrowed around the cut-off, the estimates became much smaller in absolute terms and were no longer significant, yet the coefficients were still negative. The corresponding first stage estimates are shown in the lower panel of Table 5c.

Table 5d shows the estimated coefficients for military service when f(.) and g(.) were cubic functions of year of birth. Here, the effect of military service on earnings was not statistically significant and the coefficients vary from sample to sample. Recent work by Gelman and Imbens (2014) warned against using higher order polynomials for regression

models which are based on a regression discontinuity design. From the lower portion of Table dc, we can see the first stage estimates. The cubed terms with respect to year of birth before and after the cut-off were often not statistically significant. Thus the second stage coefficients displayed in Table 5d may not be reliable.

The negative effect of military service appears to be driven by the experiences of those from better-off backgrounds. Tables 6a and 6b show the effect of military service, using the linear trend in year of birth and a quadratic trend in year of birth respectively, when the sample was restricted to the sons of professionals, managers and non-manual workers. For the samples of men born at least eight years before and after the cut-off, the effect of military service was at least a penalty of thirty percent of earnings compared to men who did not serve. Tables 6c and 6d show the estimated effect of military service using a sample of sons of manual workers, both skilled and unskilled. Here, we can see that the coefficients are smaller in absolute terms and are generally not statistically significant.

One may suspect that the experience of serving in the army may be different from that of serving in the air force or navy. One might hypothesise that recruits to the army would have engaged in more military-specific roles than recruits to the navy and air force. Vinen (2015) reports that about 26% of the Army's 1954 intake were posted to the infantry and another 16% to the artillery and armoured corp. However, Grenet et al (2011) pointed out, that even within combat units, many men would have non-combat roles such as driving trucks. The Royal Navy and Royal Airforce also have combat units, the Royal Marines Commandos and the RAF Regiment, where the personnel are trained to perform roles similar to that of the army's infantry but these units made up less than 10% and 5% of the total strengths of the navy and air force in the early 1950s.

To examine the effect of serving in the Army relative to the Navy or Air Force, the following equation was estimated:

(3) $Log(Annual\ Labour\ Income_i)=\pi_0+\pi_1*Army_i+\pi_2*Navy/Air\ Force_i+\ \pi_3*Any\ Qualifications_i+\pi_4*Chronic\ Illness_i+\pi_5*Irish\ Heritage_i+\Omega*Regional\ Dummy\ Variables_i+h(Age_i)+\xi_i.$

Table 8a shows the effects of serving in the army and the air force or navy with never having served as the default category. Under OLS, the effect of serving in the army was small and not statistically significant. However, the estimates of effect of serving in the air force or navy, although only about 5%, was statistically significant in some of the samples. However,

these estimates may not be a causal effect, but instead reflect a self-selection into these service branches either through men having volunteered for the air force or navy rather than being conscripted into the army or through the air force and navy having cherry-picked the best recruits.

Finding separate instrumental variables for being selected into the army or the navy/air force is a difficult but there are some possibilities. Firstly, having a family connection to the armed forces may influence which branch a man served in. In GHS, the occupation of the father of the respondent was recorded. A small percentage, 4%, of ex-sailors or aircrew report that their father's main occupation was in the military. However, the percentage of ex-soldiers and those who never served whose father was in the military is just under 2%. Sons of former military personnel might have better understood the military, in particular, which were the better units to serve with – in terms of providing prestige, useful skills, better treatment and so forth. They might have better understood the trade-off between volunteering as a regular for a longer period but with more say in where they served relative to being a conscript. In Table 7a and Table 7b, we can see that having a father who worked in the military had a positive effect on the respondent serving in the navy/air force with a roughly equal and opposite effect on serving in the army.

Secondly, it appears those who lived in the South West of England or in East Anglia prior to the survey were more likely to have joined as sailors or aircrew. This is not surprising because more RAF and naval bases were, and still are, located in these areas, relative to the size of their local population, than other regions of the UK. From Table 7a and Table 7b, we can see that previously living in areas with many naval or air force bases, had a negative effect on serving in the navy/air force. This is a counterintuitive finding. One must consider that in the first stage equations, I also controlled for region of residence at the time of the GHS survey because it would have affected earnings and appears both the second stage equation and the first stage equation. Thus previous region of residence will identify the probability of joining the navy/air force for those who moved to or from East Anglia or the South West of England rather than for people who never or always lived in those areas. Men might have moved to these regions to join the navy or air force. However, the effect of moving to these regions on joining the navy/air force is erased for better educated men because their migration may not have been motivated by careers in the armed forces.

Finding a separate instrument for having served in the Army is more difficult. One potential instrument is whether the respondent was of Irish heritage. As discussed above, in the earnings equation, I controlled for whether the man observed in GHS 1972 was of Irish heritage because there may have been labour market discrimination against Irish people in Britain in the early 1970s.

The interaction of being born after 1939 and being of Irish heritage is used was as an instrumental variable for being in the military, specifically the army, in the earnings equation. Being of Irish heritage might have effected earnings directly but the exclusion restriction is based on the assumption that anti-Irish earnings discrimination did not vary by year of birth. Those of Irish extraction were less likely to have served in the military because they either arrived in Britain from Ireland after they would have been called up (the Republic of Ireland being a separate country and National Service not applying to Northern Ireland even though it is within the UK). For those born in Great Britain to Irish parents, it would have been easier to avoid conscription for the reasons discussed above.

Furthermore, Irish people from nationalist backgrounds, may have been averse to serving in the British Army. After the independence of southern Ireland, Irish people continued to serve in the British Armed Forces, particularly during the Second World War when southern Ireland was a neutral country. Indeed, to this day, many people from the Republic of Ireland serve in the British military, especially in the Irish Regiments of the British Army that recruit from both sides of the Irish border. However, one could argue, given the complexities in the relationship between Ireland and Britain, even before the conflict in Northern Ireland broke out, Irish people and people of Irish heritage were, on average, less likely to serve in the British Armed Forces. However, this negative effect of being Irish on serving in the British Armed Forces would have been relatively stronger for the British Army, given that the RAF and Royal Navy played less of a role in previous conflicts in Ireland. In Table 7a and Table 7b, we can see that being of Irish heritage had a large negative effect on having served in the British Army but there was no effect on having served in the Royal Navy or Royal Air Force. The interaction of being Irish and being born after 1939 is positive. This is because, with the end of National Service and the huge reduction in the size of the forces, the probability of serving in the army for the non-Irish people converged with the low probability of Irish people joining the British army.

Another potential source of exogenous variation in military service that appears to have affected the probability of serving in the army more than the other branches of the military, was the interaction of the respondent's year of birth with their self-report of chronic illness. As discussed above, the military authorities used the medical examination as a means of regulating the size of the intake of recruits. When man-power demands were less severe, a greater proportion of men were deemed as being unfit for service. About 15% of the cohorts born in the early 1930s were deemed unfit, whereas for the last few cohorts born in the 1930s about 22% were deemed unfit. Men who would have been deemed fit in earlier cohorts were deemed unfit in later years. The interaction of year of birth and having a chronic illness appears to have affected the probability of serving in the army more than the probability of serving in the navy or air force, perhaps reflecting a greater emphasis on physical fitness in the army. In Table 7b, we can see that having a chronic illness had a large negative effect on having served in the British Army, twice as large as the effect of having a chronic illness on having served in the Royal Navy or Royal Air Force. The interaction of having a chronic illness and being born after 1939 was positive. This is because, with the end of National Service and the huge reduction in the size of the forces, the probability of serving in the army for those without an illness converged with the low probability of serving for those with an illness.

In Table 8b & Table 8c, we can see the IV estimates of the effect of serving in the army and of serving in the navy/air force. Nearly all of the coefficients are negative but there are no statistically significant effects. The coefficients for serving in the army are generally smaller in absolute terms than the navy/air force coefficients. The F-Statistics for all of the instruments in each equation are generally above the rule of thumb of ten. According to Stock and Yogo (2005), for two endogenous variables with six instrumental variables, the critical values are 15.72, 9.48 & 6.08 for desired maximal bias of IV relative to OLS of 0.05, 0.1 and 0.2 respectively. The Sanderson & Windmeijer (2016) conditional F-Test Statistics are also reported. Sanderson & Windmeijer (2016) demonstrated that IV estimates may be misleading when the conditional F-statistic is low. Thus one should place more weight on the estimates using the sample of men born four or five years before and after the cut-off than on the estimates derived from the larger samples. In general, once IV is used, the positive effect on earnings of serving in the navy/air force, found under OLS, disappears.

Tables 9a and Tables 9b show the IV estimates of the effect of being in the military (regardless of branch) using the same instruments used to estimate the results in Tables 8b

and 8c. Using father's military service, previously living near naval/air bases, the interaction of Irish heritage or having a chronic illness with the abolition of conscription as instrumental variables produces estimates of the effect of being in the military that are very similar to those estimates based on using the discontinuity in National Service alone (see Tables 5b, 5c, 5d).

V. Conclusion

In general, there was some evidence of a negative effect of military service on civilian earnings at least ten years after the men left the military. Grenet, Hart and Roberts (2011) found that the disparity in earnings disappears once the men are in middle age and older. Both of these findings are in line with Angrist (1990) who found a similar sized earnings disparity between veterans and non-veterans 10-15 years after the Vietnam War and Angrist, Chen and Song (2011) who found that the difference in earnings disappeared once the men became older. A factor common to both British National Service and US Vietnam-era conscription was that, men had to serve for two years. A difference between British and American conscription, was that those drafted to Vietnam would likely have found themselves in an intensive combat zone whereas only some British National Servicemen would have been sent to a combat zone.[12] The similarities of the British and American research results, in terms of the size and timing of the earnings penalty, perhaps suggest that the loss of earnings is due to lost labour market experience rather than a traumatizing effect of military combat.

I also find that the earnings penalty affects men from better-off backgrounds the most. Men from less-well off backgrounds may have gained useful experience during their time of the military whereas military experience is not a good substitute for civilian labour market experience for those from better off-backgrounds.

Another finding is that the positive effect of having served in the navy or air force on later earnings appears to have been because of self-selection or the selectivity of the military authorities. My results suggest that policies are needed to ensure that training and education are available to service-people, regardless of pre-entry education and background and

[12] Vinen (2015) estimated that 19,521 British service people died world-wide between 1948 and 1960. Around 1,600 people died in combat. The remainder of deaths were due to transportation accidents, training accidents and disease. In contrast, around 58,000 American service people died during the Vietnam War, about 41,000 of whom were killed in action.

regardless of the branch of military they serve in, so they can successfully adjust to the civilian labour market.

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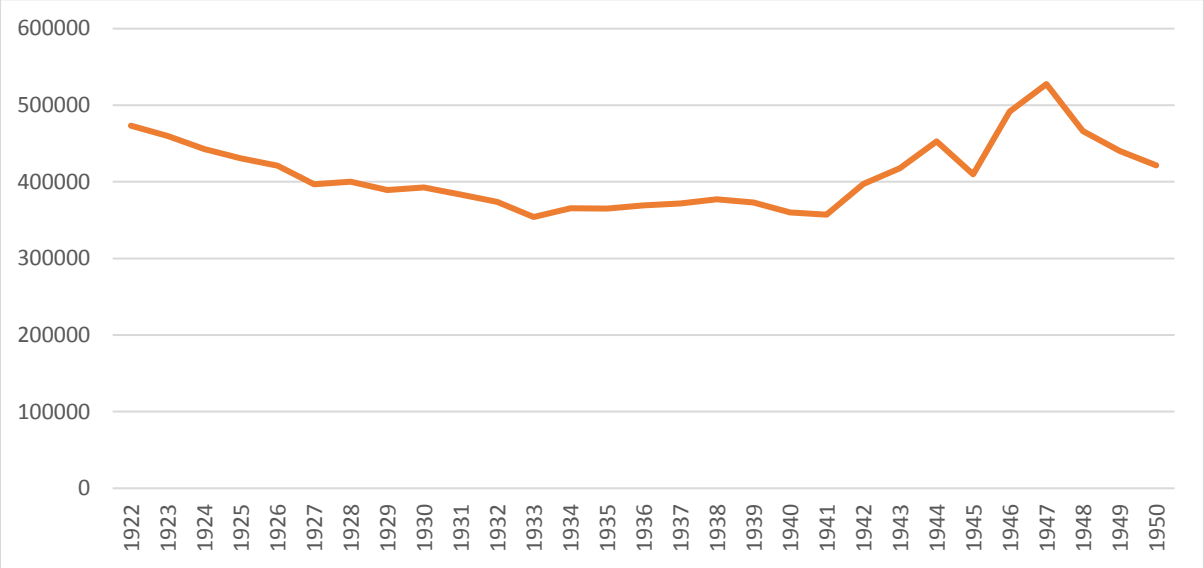
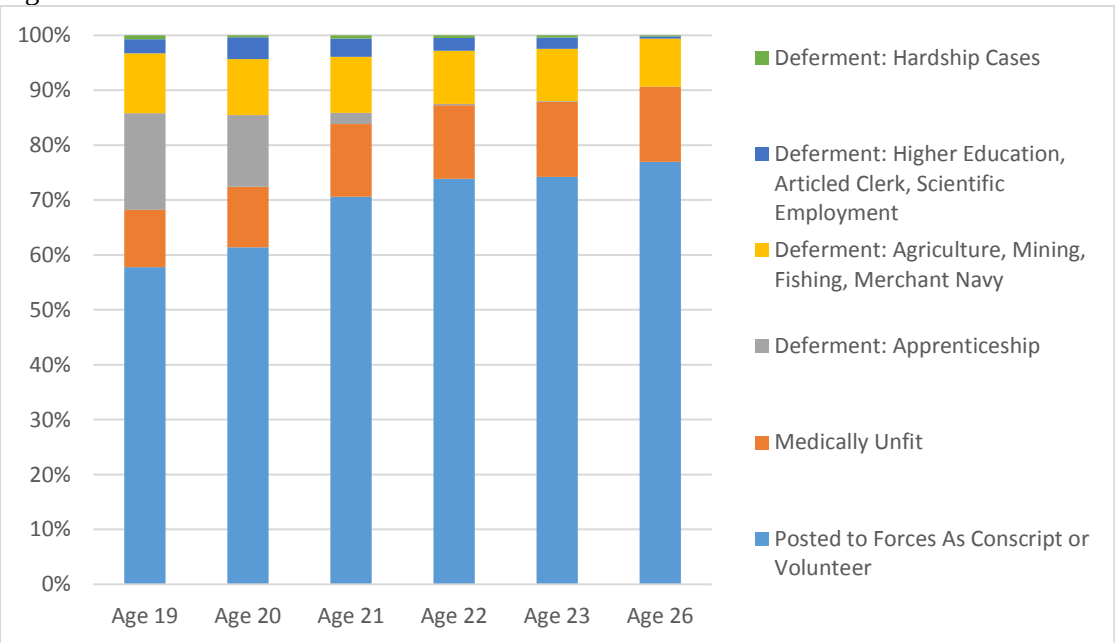
Figures:

Figure 1: Male births in the UK by year



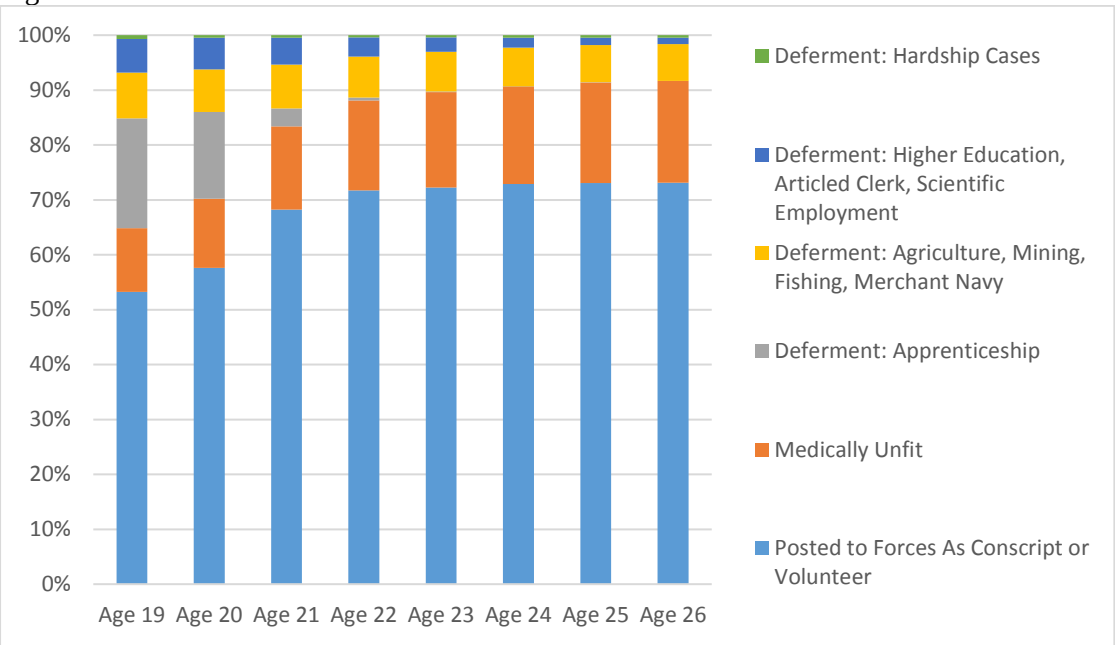
Source: Human Mortality Database http://www.mortality.org/cgi-bin/hmd/country.php?cntr=GBR&level=2

Figure 2a: National Service status of 1930 birth cohort



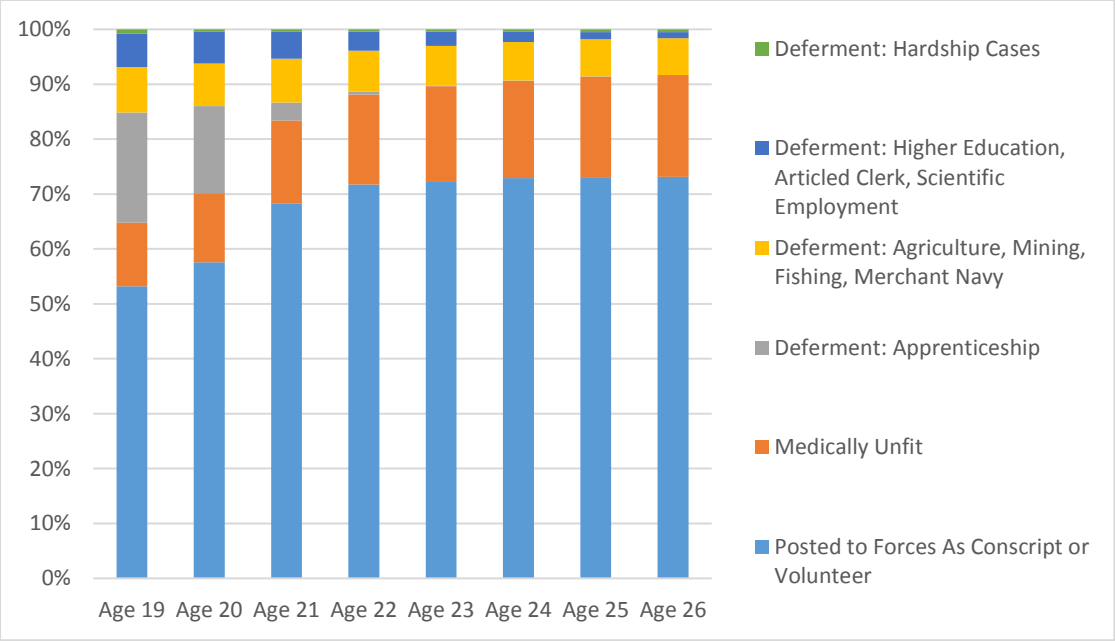
Source: Appendix V of Vinen (2015), derived from Ministry of Labour Gazette, 1948-1960.

Figure 2b: National service status of 1932 birth cohort



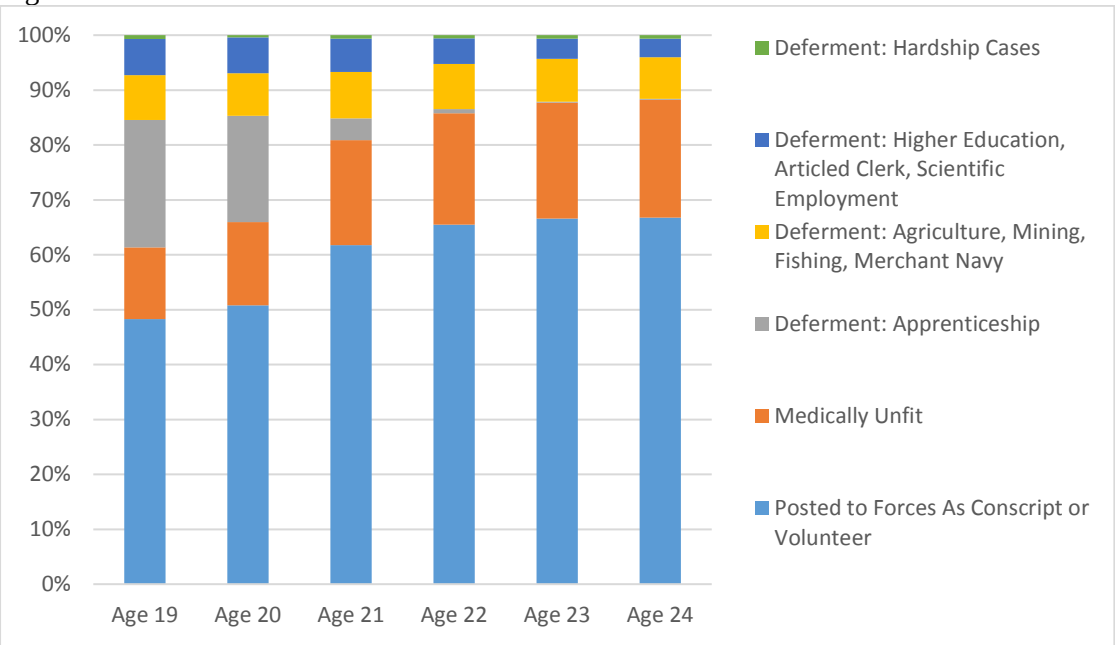
Source: Appendix V of Vinen (2015), derived from Ministry of Labour Gazette, 1948-1960.

Figure 2c: National Service status of 1934 birth cohort



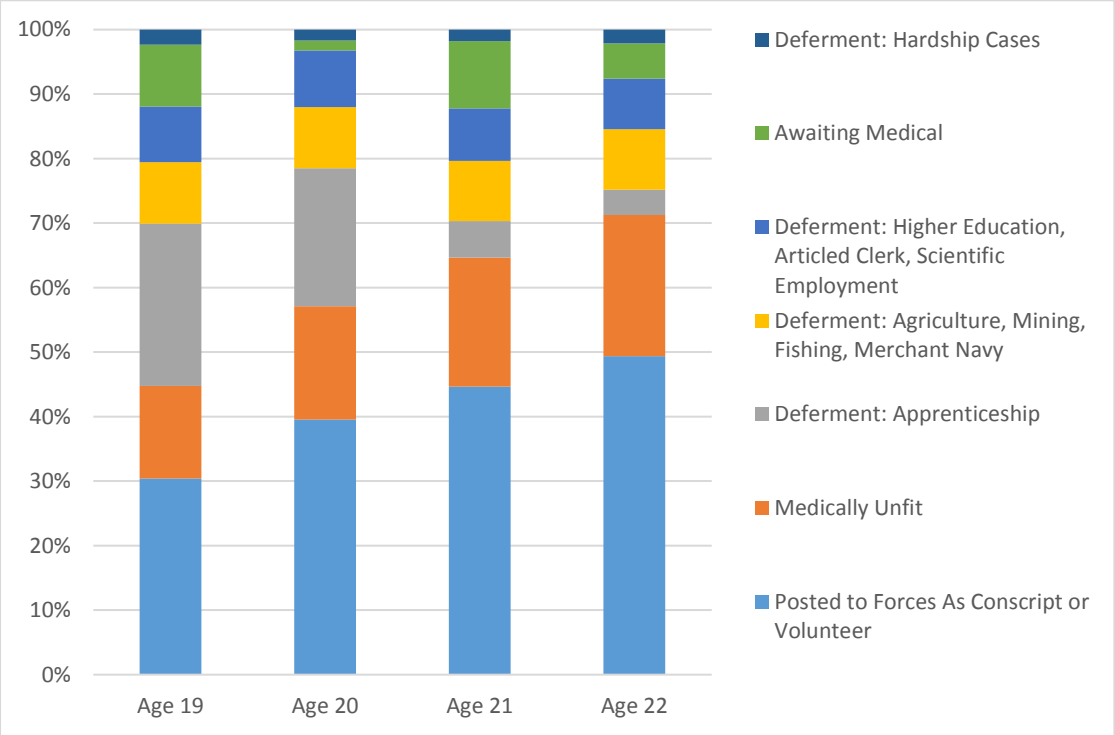
Source: Appendix V of Vinen (2015), derived from Ministry of Labour Gazette, 1948-1960.

Figure 2d: National Service status of 1936 birth cohort



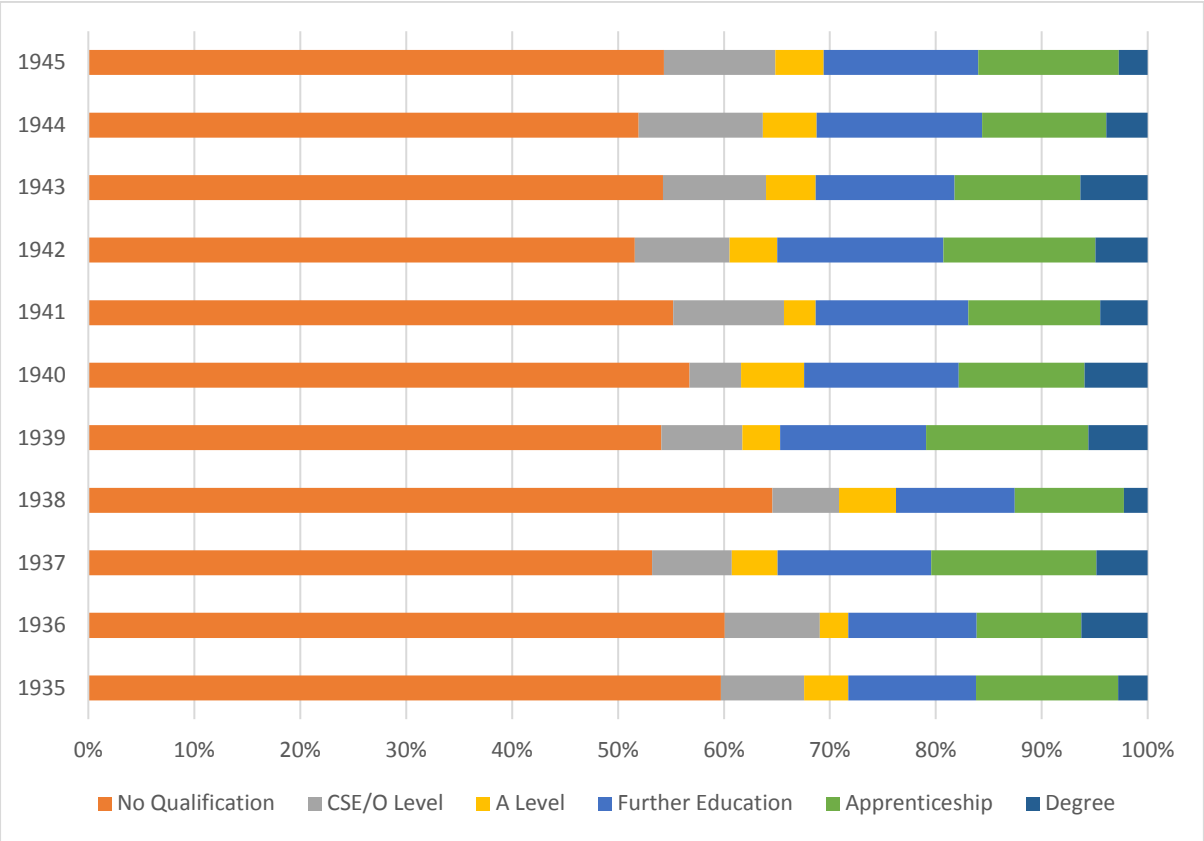
Source: Appendix V of Vinen (2015), derived from Ministry of Labour Gazette, 1948-1960.

Figure 2e: National Service status of 1938 birth cohort



Source: Appendix V of Vinen (2015), derived from Ministry of Labour Gazette, 1948-1960.

Figure 3: Distribution of educational qualifications by year of birth.



Source: GHS 1972.

Tables:

Table 1a: Postings to branches of military

Year of Posting	Total Number of Men			Distribution			Ratio of Army to Other Services
	Army	Air Force	Navy	Army	Air Force	Navy	
1952	159,024	70,975	6,731	67.18	29.98	2.84	2.05
1953	143,336	62,082	6,506	67.64	29.29	3.07	2.09
1954	136,419	56,048	8,348	67.93	27.91	4.16	2.12
1955	135,348	58,576	8,684	66.80	28.91	4.29	2.01
1956	118,777	51,522	6,744	67.09	29.10	3.81	2.04
1957	98,751	31,786	4,739	73.00	23.50	3.50	2.70
1958	88,348	25,500	3,818	75.08	21.67	3.24	3.01

Source: Ministry of Labour and National Service. Reports for the year 1952 to 1958.
Includes postings of men who volunteered as regulars from National Service field of call up.

Table 1b: Posting of conscripts and volunteers from National Service registrations

Year of Posting	Total Conscripts	Total Volunteers	Ratio of Conscripts to Volunteers
1952	170,384	66,346	2.57
1953	154,064	57,860	2.66
1954	147,975	52,840	2.80
1955	156,833	45,775	3.43
1956	130,023	47,020	2.77
1957	101,165	34,111	2.97
1958	81,208	36,458	2.23

Source: Ministry of Labour and National Service. Reports for the year 1952 to 1958.

Table 2: Distribution of initial preferences of branch and actual posting

Registration Year	Initial Preferences			Actual Posting of Volunteers			Actual Postings of Conscripts		
	Army	Air Force	Navy	Army	Air Force	Navy	Army	Air Force	Navy
1952	47.25	41.92	10.83	48.69	46.77	4.54	74.37	23.45	2.18
1953	51.01	39.31	9.68	51.37	43.51	5.12	73.74	23.96	2.30
1954	52.55	37.74	9.71	52.62	42.70	4.68	73.40	22.63	3.97
1955	52.51	36.01	11.47	58.31	36.05	5.63	69.28	26.83	3.89
1956	52.38	36.81	10.81	62.31	32.60	5.09	68.82	27.84	3.35
1957	54.59	32.71	12.70	61.27	32.83	5.90	76.96	20.35	2.70
1958	56.26	33.92	9.82	55.57	36.92	7.52	83.85	14.83	1.33

Source: Ministry of Labour and National Service. Reports for the year 1952 to 1958.

Table 3a: Percentage of birth cohort who never served

Birth Cohort	GHS 1972	Ministry of Labour & National Service
1930	27.45	23.76
1931	28.95	27.42
1932	33.56	30.59
1933	23.13	27.15
1934	25.57	27.61
1935	35.12	31.37
1936	31.71	34.05
1937	40.24	38.43
1938	48.07	51.10
1939	71.53	71.13
1940	90.34	n/a
1941	88.17	n/a
1942	93.75	n/a
1943	92.11	n/a
1944	93.64	n/a
1945	94.18	n/a
1946	93.91	n/a
1947	92.39	n/a
1948	95.07	n/a
1949	96.72	n/a

*Ministry of Labour and National Service estimate is based on the proportion of National Service registrations who were posted to the forces.

**Ministry of Labour and National Service re-organised as Ministry of Labour after the last group of conscripts entered service in 1960 and, so, stopped collecting detailed information on the proportion of birth cohorts who entered the military.

Table 3b: Distribution of men across branch of military by year of birth

Year of Birth	Army	Air Force	Navy	Ratio of Army to Other Services:
1930	59.46	30.63	9.91	1.47
1931	60.19	28.70	11.11	1.51
1932	59.60	36.36	4.04	1.48
1933	56.64	35.40	7.96	1.31
1934	64.89	25.95	9.16	1.85
1935	58.72	32.11	9.17	1.42
1936	63.39	31.25	5.36	1.73
1937	65.31	31.63	3.06	1.88
1938	67.02	21.28	11.70	2.03
1939	63.41	24.39	12.20	1.73
1940	82.35	17.65	0.00	4.67
1941	50.00	25.00	25.00	1.00
1942	53.85	23.08	23.08	1.17
1943	53.33	26.67	20.00	1.14
1944	36.36	45.45	18.18	0.57
1945	63.64	18.18	18.18	1.75
1946	41.67	25.00	33.33	0.71
1947	46.67	26.67	26.67	0.87
1948	57.14	42.86	0.00	1.33
1949	50.00	50.00	0.00	1.00

Source: GHS 1972.

Table 3c: Percentage of birth cohort conscripted or volunteered

Year of Birth	Conscripted	Volunteered	Ratio of Conscripts to Volunteers
1930	77.48	22.52	3.44
1931	76.85	23.15	3.32
1932	69.70	30.30	2.30
1933	69.91	30.09	2.32
1934	74.81	25.19	2.97
1935	66.06	33.94	1.95
1936	62.50	37.50	1.67
1937	70.41	29.59	2.38
1938	64.89	35.11	1.85
1939	53.66	46.34	1.16

Source: GHS 1972.

Table 4: Descriptive statistics

	Never Served	Army	Navy/Air Force	p-value of difference of Army vs. Never Served	p-value of difference of Navy/Air Force vs. Never Served
Annual Labour Income	1736.6	1840.39	2028.16	0.01	0.00
	(22.48)	(34.65)	(53.78)		
Year of Birth	1942.03	1935.17	1935.31	0.00	0.00
	(0.1)	(0.15)	(0.21)		
Any Qualifications	0.55	0.37	0.6	0.00	0.03
	(0.01)	(0.01)	(0.02)		
<u>Region of Residence at Time of Survey:</u>					
North	0.06	0.06	0.05	0.77	0.41
	(0.01)	(0.01)	(0.01)		
Yorkshire & Humberside	0.09	0.07	0.08	0.14	0.63
	(0.01)	(0.01)	(0.01)		
North West	0.12	0.1	0.09	0.06	0.06
	(0.01)	(0.01)	(0.01)		
East Midland	0.07	0.07	0.06	0.87	0.63
	(0.01)	(0.01)	(0.01)		
West Midlands	0.11	0.11	0.08	0.97	0.11
	(0.01)	(0.01)	(0.01)		
East Anglia	0.03	0.04	0.07	0.25	0.00
	(0)	(0.01)	(0.01)		
Greater London	0.12	0.12	0.08	0.87	0.01
	(0.01)	(0.01)	(0.01)		
South East	0.18	0.21	0.22	0.11	0.08
	(0.01)	(0.02)	(0.02)		
South West	0.06	0.08	0.11	0.14	0.01
	(0.01)	(0.01)	(0.02)		
Wales	0.06	0.05	0.04	0.75	0.12
	(0.01)	(0.01)	(0.01)		
Scotland	0.1	0.09	0.11	0.81	0.32
	(0)	(0.01)	(0.01)		
Long Standing Illness	0.14	0.12	0.12	0.06	0.23
	(0.01)	(0.01)	(0.02)		
Immigrant or son of an immigrant	0.16	0.1	0.1	0.00	0.00
	(0.01)	(0.01)	(0.01)		
Irish born or of Irish Heritage	0.07	0.05	0.05	0.02	0.07
	(0.01)	(0.01)	(0.01)		
Father Served	0.02	0.01	0.04	0.64	0.03
	(0)	(0)	(0.01)		
Previously lived in South West/East Anglia	0.09	0.1	0.14	0.47	0.01
	(0.01)	(0.01)	(0.02)		

Source: GHS 1972.
Standard errors in parentheses.

Table 5a: OLS estimates of serving in armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Armed Forces	-0.005	0.016	0.018	0.021	0.015	-0.005	-0.004	-0.026
	(0.032)	(0.03)	(0.027)	(0.025)	(0.023)	(0.025)	(0.023)	(0.024)
n	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, whether any qualification held, having a chronic illness, being of Irish heritage and eleven dummy variables indicating region of residence are also included in each model but are not displayed here for brevity. Standard errors in parentheses.

Table 5b: IV estimates of serving in armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Second Stage Estimates:								
Served in Armed Forces	-0.003	-0.106	-0.126	-0.152	-0.151	-0.223	-0.251	-0.425
	(0.22)	(0.178)	(0.14)	(0.119)	(0.105)	(0.095)	(0.087)	(0.094)
First Stage Estimates:								
Year of Birth	-0.129	-0.087	-0.072	-0.064	-0.047	-0.039	-0.033	-0.033
	(0.016)	(0.012)	(0.009)	(0.007)	(0.006)	(0.005)	(0.004)	(0.004)
Born After 1939	-0.219	-0.28	-0.3	-0.316	-0.352	-0.378	-0.395	-0.397
	(0.047)	(0.042)	(0.037)	(0.034)	(0.031)	(0.03)	(0.028)	(0.027)
Year of Birth*Born After 1939	0.111	0.077	0.062	0.055	0.039	0.034	0.027	0.028
	(0.022)	(0.015)	(0.011)	(0.009)	(0.007)	(0.006)	(0.005)	(0.005)
F-Stat	22.43	36.27	52.40	77.59	99.90	123.79	145.63	174.07
n	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 and its the interaction with year of birth. Standard errors in parentheses.

Table 5c: IV estimates of serving in armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Second Stage Estimates:								
Served in Armed Forces	-0.314	-0.061	-0.029	-0.105	-0.055	-0.208	-0.192	-0.274
	(0.22)	(0.144)	(0.121)	(0.11)	(0.093)	(0.085)	(0.077)	(0.079)
First Stage Estimates:								
Year of Birth	-0.249	-0.254	-0.195	-0.16	-0.163	-0.14	-0.123	-0.123
	(0.059)	(0.042)	(0.031)	(0.025)	(0.021)	(0.018)	(0.015)	(0.015)
Year of Birth Squared	-0.039	-0.041	-0.024	-0.016	-0.017	-0.013	-0.01	-0.01
	(0.019)	(0.01)	(0.006)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)
Born After 1939	-0.339	-0.192	-0.216	-0.228	-0.227	-0.233	-0.254	-0.257
	(0.115)	(0.071)	(0.059)	(0.052)	(0.048)	(0.045)	(0.042)	(0.04)
Year of Birth*Born After 1939	0.428	0.247	0.187	0.146	0.15	0.12	0.107	0.109
	(0.137)	(0.069)	(0.046)	(0.035)	(0.028)	(0.023)	(0.02)	(0.018)
Year of Birth Squared*Born After 1939	-0.01	0.041	0.024	0.017	0.017	0.014	0.011	0.011
	(0.036)	(0.015)	(0.008)	(0.005)	(0.004)	(0.003)	(0.002)	(0.002)
F-Stat	9.20	20.81	28.01	35.92	55.47	70.57	85.23	86.53
n	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, year of birth squared, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 and its the interaction with year of birth and year of birth squared. Standard errors in parentheses.

Table 5d: IV estimates of serving in armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Second Stage Estimates:								
Served in Armed Forces	-0.507	-0.267	-0.198	-0.062	-0.088	0.041	-0.022	0.152
	(0.425)	(0.315)	(0.212)	(0.172)	(0.16)	(0.142)	(0.124)	(0.129)
First Stage Estimates:								
Year of Birth	-0.33	-0.262	-0.316	-0.294	-0.224	-0.228	-0.218	-0.218
	(0.144)	(0.094)	(0.071)	(0.056)	(0.047)	(0.04)	(0.035)	(0.035)
Year of Birth Squared	-0.117	-0.047	-0.09	-0.076	-0.04	-0.041	-0.038	-0.038
	(0.127)	(0.059)	(0.035)	(0.023)	(0.016)	(0.012)	(0.009)	(0.009)
Year of Birth Cubed	-0.017	-0.001	-0.009	-0.007	-0.002	-0.002	-0.002	-0.002
	(0.028)	(0.01)	(0.005)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Born After 1939	-0.055	-0.501	-0.247	-0.213	-0.213	-0.22	-0.202	-0.197
	(0.112)	(0.203)	(0.121)	(0.088)	(0.073)	(0.065)	(0.06)	(0.056)
Year of Birth*Born After 1939		0.745	0.395	0.319	0.225	0.239	0.204	0.199
		(0.315)	(0.167)	(0.107)	(0.077)	(0.061)	(0.051)	(0.046)
Year of Birth Squared*Born After 1939	0.346	-0.171	0.056	0.064	0.036	0.035	0.038	0.039
	(0.208)	(0.143)	(0.066)	(0.037)	(0.023)	(0.017)	(0.012)	(0.011)
Year of Birth Cubed*Born After 1939	-0.029	0.03	0.012	0.008	0.003	0.003	0.002	0.002
	(0.02)	(0.019)	(0.008)	(0.004)	(0.002)	(0.001)	(0.001)	(0.001)
F-Stat	4.77	5.63	9.69	13.50	17.82	21.23	29.08	36.89
n	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, year of birth squared, year of birth cubed, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 and its the interaction with year of birth, year of birth squared and year of birth cubed. Standard errors in parentheses.

Table 6a: IV estimates of serving in armed forces on log earnings
(sons of professionals, managers & non-manual workers only)

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Armed Forces	0.137	-0.002	-0.115	-0.182	-0.273	-0.314	-0.371	-0.561
	(0.269)	(0.267)	(0.207)	(0.17)	(0.158)	(0.144)	(0.13)	(0.14)
F-Stat	17.95	23.52	34.89	50.92	63.90	79.22	93.26	113.09
n	686	904	1120	1328	1544	1737	1912	1989

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 and its interaction with year of birth. Standard errors in parentheses.

Table 6b: IV estimates of serving in armed forces on log earnings
(sons of professionals, managers & non-manual workers)

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Armed Forces	-0.290	0.006	0.025	-0.123	-0.196	-0.288	-0.319	-0.393
	(0.259)	(0.2)	(0.186)	(0.173)	(0.15)	(0.138)	(0.117)	(0.12)
F-Stat	8.36	14.37	16.33	19.68	28.20	35.91	48.10	48.31
n	686	904	1120	1328	1544	1737	1912	1989

Year of birth, year of birth squared, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 and its interaction with year of birth and year of birth squared. Standard errors in parentheses.

Table 6c: IV estimates of serving in armed forces on log earnings (sons of manual workers)

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Armed Forces	-0.269	-0.213	-0.105	-0.095	0.015	-0.103	-0.068	-0.221
	(0.351)	(0.191)	(0.163)	(0.149)	(0.122)	(0.11)	(0.102)	(0.112)
F-Stat	5.92	14.33	20.46	29.77	39.38	49.11	56.65	66.56
n	521	663	797	925	1056	1212	1332	1380

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 and its interaction with year of birth. Standard errors in parentheses.

Table 6d: IV estimates of serving in armed forces on log earnings (sons of manual workers)

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Armed Forces	-0.387	-0.153	-0.108	-0.063	0.130	-0.098	-0.006	-0.098
	(0.355)	(0.184)	(0.138)	(0.127)	(0.105)	(0.097)	(0.092)	(0.098)
F-Stat	2.20	7.81	12.75	17.93	29.04	34.93	38.43	39.49
n	521	663	797	925	1056	1212	1332	1380

Year of birth, year of birth squared, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 and its interaction with year of birth and year of birth squared. Standard errors in parentheses.

Table 7a: First stage estimates of served in armed forces

	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF
Number of years born before/after cut-off	+/-3	+/-3	+/-4	+/-4	+/-5	+/-5	+/-6	+/-6	+/-7	+/-7	+/-8	+/-8	+/-9	+/-9	+/-10	+/-10
Irish Heritage	-0.202	0.02	-0.202	0.02	-0.156	0.017	-0.135	-0.011	-0.122	-0.027	-0.134	-0.056	-0.139	-0.064	-0.137	-0.06
	(0.063)	(0.059)	(0.063)	(0.059)	(0.06)	(0.056)	(0.059)	(0.051)	(0.056)	(0.048)	(0.054)	(0.043)	(0.051)	(0.041)	(0.048)	(0.04)
Born After 1939	-0.137	-0.093	-0.137	-0.093	-0.183	-0.104	-0.197	-0.118	-0.219	-0.109	-0.245	-0.12	-0.262	-0.132	-0.272	-0.138
	(0.043)	(0.029)	(0.043)	(0.029)	(0.037)	(0.028)	(0.034)	(0.026)	(0.031)	(0.024)	(0.029)	(0.023)	(0.027)	(0.022)	(0.026)	(0.021)
Born After 1939*Irish Heritage	0.272	0.032	0.272	0.032	0.175	0.003	0.157	0.045	0.134	0.054	0.148	0.081	0.148	0.097	0.142	0.086
	(0.084)	(0.071)	(0.084)	(0.071)	(0.071)	(0.062)	(0.069)	(0.058)	(0.064)	(0.053)	(0.061)	(0.048)	(0.057)	(0.047)	(0.054)	(0.044)
Year of Birth	-0.08	-0.05	-0.08	-0.05	-0.045	-0.041	-0.04	-0.031	-0.035	-0.03	-0.024	-0.024	-0.019	-0.02	-0.016	-0.018
	(0.016)	(0.014)	(0.016)	(0.014)	(0.012)	(0.01)	(0.009)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Year of Birth*Born After 1939	0.056	0.054	0.056	0.054	0.028	0.046	0.028	0.036	0.027	0.029	0.017	0.023	0.015	0.019	0.011	0.016
	(0.02)	(0.016)	(0.02)	(0.016)	(0.014)	(0.012)	(0.01)	(0.009)	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)
Lived Near Base	-0.089	-0.125	-0.089	-0.125	-0.111	-0.108	-0.108	-0.115	-0.055	-0.113	-0.077	-0.115	-0.039	-0.16	-0.047	-0.136
	(0.093)	(0.114)	(0.093)	(0.114)	(0.081)	(0.099)	(0.074)	(0.087)	(0.068)	(0.077)	(0.062)	(0.068)	(0.058)	(0.062)	(0.054)	(0.06)
Lived Near Base*Any Qualification	-0.102	0.225	-0.102	0.225	-0.06	0.175	-0.023	0.154	-0.021	0.162	-0.002	0.175	-0.038	0.162	-0.025	0.116
	(0.077)	(0.079)	(0.077)	(0.079)	(0.066)	(0.071)	(0.059)	(0.065)	(0.055)	(0.059)	(0.052)	(0.054)	(0.047)	(0.048)	(0.045)	(0.046)
Father Served in Military	-0.122	0.13	-0.122	0.13	-0.151	0.181	-0.132	0.167	-0.098	0.143	-0.101	0.121	-0.105	0.105	-0.088	0.102
	(0.05)	(0.073)	(0.05)	(0.073)	(0.045)	(0.065)	(0.044)	(0.063)	(0.045)	(0.06)	(0.043)	(0.056)	(0.041)	(0.053)	(0.042)	(0.053)
n	1,207	1,207	1,567	1,567	1,917	1,917	2,253	2,253	2,600	2,600	2,949	2,949	3,244	3,244	3,369	3,369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. Standard errors in parentheses.

Table 7b: First stage estimates of served in armed forces

	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF	Army	Navy/ RAF
Number of years born before/after cut-off	+/-3	+/-3	+/-4	+/-4	+/-5	+/-5	+/-6	+/-6	+/-7	+/-7	+/-8	+/-8	+/-9	+/-9	+/-10	+/-10
Chronic Illness	-0.13	-0.068	-0.13	-0.068	-0.155	-0.075	-0.158	-0.067	-0.151	-0.078	-0.18	-0.071	-0.168	-0.063	-0.15	-0.066
	(0.046)	(0.035)	(0.046)	(0.035)	(0.04)	(0.033)	(0.038)	(0.032)	(0.036)	(0.03)	(0.034)	(0.029)	(0.032)	(0.028)	(0.031)	(0.027)
Born After 1939	-0.142	-0.097	-0.142	-0.097	-0.194	-0.111	-0.208	-0.123	-0.23	-0.114	-0.258	-0.122	-0.272	-0.133	-0.282	-0.141
	(0.043)	(0.03)	(0.043)	(0.03)	(0.037)	(0.028)	(0.034)	(0.026)	(0.031)	(0.025)	(0.029)	(0.023)	(0.027)	(0.023)	(0.026)	(0.022)
Born After 1939*Chronic Illness	0.156	0.054	0.156	0.054	0.161	0.061	0.159	0.06	0.153	0.066	0.172	0.06	0.163	0.067	0.149	0.067
	(0.06)	(0.04)	(0.06)	(0.04)	(0.05)	(0.038)	(0.045)	(0.037)	(0.043)	(0.035)	(0.039)	(0.033)	(0.037)	(0.032)	(0.036)	(0.031)
Year of Birth	-0.08	-0.05	-0.08	-0.05	-0.046	-0.041	-0.04	-0.031	-0.034	-0.03	-0.024	-0.024	-0.019	-0.021	-0.016	-0.018
	(0.016)	(0.014)	(0.016)	(0.014)	(0.011)	(0.01)	(0.009)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Year of Birth*Born After 1939	0.058	0.054	0.058	0.054	0.03	0.046	0.028	0.035	0.027	0.029	0.017	0.023	0.015	0.019	0.011	0.016
	(0.02)	(0.016)	(0.02)	(0.016)	(0.014)	(0.012)	(0.01)	(0.009)	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)
Lived Near Base	-0.08	-0.124	-0.08	-0.124	-0.107	-0.107	-0.107	-0.115	-0.052	-0.111	-0.073	-0.113	-0.034	-0.158	-0.043	-0.135
	(0.095)	(0.114)	(0.095)	(0.114)	(0.082)	(0.099)	(0.074)	(0.087)	(0.068)	(0.077)	(0.062)	(0.068)	(0.058)	(0.062)	(0.055)	(0.06)
Lived Near Base*Any Qualification	-0.103	0.225	-0.103	0.225	-0.059	0.175	-0.025	0.153	-0.022	0.161	-0.003	0.174	-0.041	0.16	-0.027	0.115
	(0.078)	(0.079)	(0.078)	(0.079)	(0.066)	(0.071)	(0.059)	(0.064)	(0.055)	(0.059)	(0.052)	(0.053)	(0.048)	(0.048)	(0.045)	(0.046)
Father Served in Military	-0.125	0.128	-0.125	0.128	-0.164	0.177	-0.144	0.162	-0.11	0.137	-0.113	0.116	-0.116	0.1	-0.098	0.097
	(0.05)	(0.073)	(0.05)	(0.073)	(0.044)	(0.065)	(0.043)	(0.063)	(0.044)	(0.06)	(0.042)	(0.056)	(0.041)	(0.053)	(0.042)	(0.053)
N	1,207	1,207	1,567	1,567	1,917	1,917	2,253	2,253	2,600	2,600	2,949	2,949	3,244	3,244	3,369	3,369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. Standard errors in parentheses.

Table 8a: OLS estimates of effect of different branches of the armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Army	-0.037	-0.010	0.001	0.000	-0.008	-0.025	-0.024	-0.050
	(0.037)	(0.034)	(0.031)	(0.028)	(0.026)	(0.026)	(0.024)	(0.026)
Served in Navy/Air Force	0.053	0.058	0.046	0.056	0.050	0.026	0.027	0.013
	(0.038)	(0.034)	(0.031)	(0.028)	(0.027)	(0.032)	(0.029)	(0.03)
n	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. Standard errors in parentheses.

Table 8b: IV estimates of effect of different branches of the armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Army	0.069	-0.032	-0.048	-0.164	-0.081	-0.150	-0.103	-0.189
	(0.197)	(0.184)	(0.195)	(0.202)	(0.188)	(0.174)	(0.188)	(0.204)
Served in Navy/Air Force	0.017	-0.113	-0.181	-0.144	-0.248	-0.272	-0.439	-0.668
	(0.197)	(0.184)	(0.195)	(0.202)	(0.188)	(0.174)	(0.188)	(0.204)
F-test for Army Equation First Stage	6.33	8.54	10.94	15.06	20.25	25.76	29.43	34.22
SW Test	7.22	10.04	7.54	6.71	6.19	6.29	3.84	3.87
F-test for Navy/Air Force Equation First Stage	7.04	9.47	11.33	13.58	16.03	18.41	19.81	22.10
SW Test	7.66	10.95	6.46	4.25	4.26	4.56	3.40	3.15
N	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 interacted with year of birth, being of Irish heritage interacted with being born after 1939, having a father who served in military and previously lived near a naval or air base. Standard errors in parentheses.

Table 8c: IV estimates of effect of different branches of the armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Army	0.083	-0.026	0.021	-0.115	-0.045	-0.180	-0.098	-0.171
	(0.223)	(0.183)	(0.187)	(0.192)	(0.171)	(0.162)	(0.176)	(0.192)
Served in Navy/Air Force	-0.010	-0.127	-0.181	-0.142	-0.241	-0.270	-0.434	-0.682
	(0.223)	(0.183)	(0.187)	(0.192)	(0.171)	(0.162)	(0.176)	(0.192)
F-test for Army Equation First Stage	5.96	9.71	12.69	16.5	22.46	27.23	30.15	34.95
SW Test	6.44	10.37	7.83	6.48	6.32	6.18	3.71	3.73
F-test for RAF/RN Equation First Stage	7.17	9.61	11.37	13.61	15.80	17.95	19.48	21.73
SW Test	6.99	9.48	6.16	4.18	4.63	4.85	3.55	3.30
N	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 interacted with year of birth, long-standing chronic illness interacted with being born after 1939, having a father who served in military and previously lived near a naval or air base. Standard errors in parentheses.

Table 9a: IV estimates of serving in armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Armed Forces	0.048	-0.067	-0.106	-0.155	-0.149	-0.198	-0.231	-0.373
	(0.186)	(0.156)	(0.125)	(0.112)	(0.094)	(0.089)	(0.082)	(0.086)
F-Stat	10.55	14.88	22.33	31.71	42.17	50.74	57.92	68.21
n	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 interacted with year of birth, being of Irish heritage interacted with being born after 1939, having a father who served in military and previously lived near a naval or air base. Standard errors in parentheses.

Table 9b: IV estimates of serving in armed forces on log earnings

Window Around Cut-Off	+/-3 years	+/-4 years	+/-5 years	+/-6 years	+/-7 years	+/-8 years	+/-9 years	+/-10 years
Served in Armed Forces	0.040	-0.070	-0.066	-0.127	-0.121	-0.214	-0.223	-0.363
	(0.191)	(0.149)	(0.119)	(0.11)	(0.092)	(0.095)	(0.085)	(0.087)
F-Stat	11.93	17.36	24.75	34.37	45.30	52.19	58.80	69.05
n	1207	1567	1917	2253	2600	2949	3244	3369

Year of birth, whether any qualification held, longstanding chronic illness, Irish heritage and eleven dummy variables indicating region of residence are included in the first and second stage equations. The Instrumental Variables are a dummy variable indicating born after 1939 interacted with year of birth, chronic longstanding illness interacted with being born after 1939, having a father who served in military, previously lived near a naval or air base. Standard errors in parentheses.