

UMEÅ UNIVERSITY

Essays on Military Labour Supply in the Era of Voluntary Recruitment

Peter Bäckström

Department of Economics
Umeå School of Business, Economics and Statistics
Umeå 2020

This work is protected by the Swedish Copyright Legislation (Act 1960:729)
Licentiate thesis
ISBN: 978-91-7855-154-5
ISSN: 0348-1018
Umeå Economic Studies No. 965
Cover: *Värvare*. Painting by Gustaf Cederström, 1879. Nationalmuseum (CC BY-SA).
License terms for photo available at: https://digitaltmuseum.se/021046508457/varvare
Electronic version available at: http://umu.diva-portal.org/
Printed by: UmU Print Service at Umeå University
Umeå, Sweden 2020

Sov mitt lilla hjärta, roligt i din bädd
Inte vara ängslig, inte vara rädd

Ty i svarta natten, över skog och mark
Över vida vatten, vaktar farbror Stark

Han har skarpa ögon och en stor kanon
Och han släpper ingen jävel över bron

Ur *Vaggvisa* av Allan Edwall

Abstract

This thesis consists of an introductory part and two self-contained chapters related to the supply of volunteers to the Swedish Armed Forces.

Chapter [I] represents the first effort to explore the relationship between civilian labour market conditions and the supply of labour to the military in the all-volunteer environment that Sweden entered after the abolishment of the peacetime draft in 2010. The effect of civilian unemployment on the rate of applications from individuals aged 18 to 25 to initiate basic military training is investigated using panel data on Swedish counties for the years 2011 through 2015. A linear fixed-effects model is estimated to investigate the relationship, while controlling for a range of socio-demographic covariates and unobserved heterogeneity on the regional level, as well as aggregate trends on the national level. The results indicate a positive and statistically significant relationship between the unemployment rate and the application rate. The results are robust to non-linear form specifications, as well as allowing the civilian unemployment rate to be endogenous. As such, the results suggest that the civilian labour market environment in Sweden can give rise to non-trivial fluctuations in the supply of applications to initiate basic military training within the Swedish Armed Forces.

Chapter [II] studies how local labour market conditions influence the quality composition of those who volunteer for military service in Sweden. A fixed-effects regression model is estimated on a panel data set containing IQ scores for those who applied for military basic training across Swedish municipalities during the period 2010 to 2016. The main finding is that low civilian employment rates at the local level tend to increase the mean IQ score of those who volunteer for military service, whereas the opposite is true if employment rates in the civilian labour market move in a more favourable direction. As such, the results suggest that the negative impact of a strong civilian economy on recruitment volumes is reinforced by a deterioration in recruit quality.

Keywords: conscription; enlistment test; fixed effects model; military labour market; military labour supply; military recruitment; recruitment; Roy model; self-selection

Acknowledgments

Even though I am the sole author of this thesis, I owe gratitude to many persons that have contributed to its completion in many different ways.

I wish to thank my supervisor Gauthier Lanot and my co-supervisor Niklas Hanes for being my guides in writing this thesis. Thank you Gauthier for your critical feedback and for pushing me to keep improving my writing (*Be clear!*) and empirical analyses (*What does the data tell you?*). Thank you, Niklas, for helping me to ask the right questions and for your positive and encouraging way.

The thesis project was made possible due to the joint effort of Umeå School of Business, Economics and Statistics (USBE); the Swedish Defence Research Agency (FOI); and the Swedish Armed Forces. A big thank you to Christian Ifvarsson at FOI for encouraging me to pursue my academic ambitions. Lars Persson at USBE deserves credit for making the collaboration between FOI and USBE possible. Per Åkerblom and Anders Clareués at the Swedish Armed Forces also had a role in making the project possible at an early stage. Thank you for this.

Thank you to all my colleagues at FOI and at the Swedish Armed Forces Headquarters. It has been a pleasure working with all of you! Mattias Johansson, head of my operational research team, deserves a special thanks for providing me with the freedom necessary to combine my academic pursuits with my daily work as a human slide rule under military command. Evelina Bonnier deserves a thank you for providing valuable feedback on my work. Thanks also to Richard Langlais for excellent proof reading.

Since I spent most of the time writing this thesis away from the university, I am sorry to have missed most of the daily contact and social interaction with colleagues in Umeå. However, I wish to take the opportunity to thank Mattias Vesterberg for always having a minute to talk. I also owe thanks to Magnus, Linn, Katharina, and Olle for reading and commenting on my papers.

Thank you to my family and to all my friends. I am grateful for each and every one of you. My friends for being great friends. My mother and my father for always being there and for providing their unconditional love and support. My brother and my sisters, along with their families, for being who they are. Finally, but most of all, I would like to thank and express my deepest gratitude to Ida and Ella for reminding me what truly matters in life (hint: it is not economics). I dedicate this work to the both of you.

Stockholm in December 2019

Peter Bäckström

This thesis consists of an introductory part and two self-contained chapters related to the supply of volunteers to the Swedish Armed Forces:

Chapter [I]
Bäckström, P. 2019. "Are Economic Upturns Bad for Military Recruitment? A Study on Swedish Regional Data 2011–2015." *Defence and Peace Economics* 30 (7): 813-829 (reprinted with permission)

Chapter [II]
Bäckström, P. 2019. "Self-Selection and Recruit Quality in Sweden's All Volunteer Force: Do Civilian Opportunities Matter?" *Umeå Economics Studies*, No. 964

1 Introduction

Compulsory military conscription for males formed the basis for the military manpower system in Sweden throughout the 20th century. Following a gradual decline, which began at the end of the Cold War, in the volumes of individuals needed for military service, peacetime conscription was officially suspended in July 2010. The relatively small number of soldiers and sailors needed (in a historical context) for the Swedish Armed Forces was now to be recruited on a voluntary basis and employed as professionals.

In a conscripted army, soldiers serve because they fulfil a socially-defined role, whereas in a voluntary military force, they serve in order to fulfil the conditions of an employment contract (Lindberg 2019). The all-volunteer environment also meant a new role for the Armed Forces. In order for voluntary recruitment to be successful, the Armed Forces would have to become "an attractive employer, requiring favourable conditions for those serving" (Total Defence Service Commission 2009: 54). Concerns were raised in connection with the reform about how the Armed Forces would be able to tackle the competition with other employers in the labour market. In a parliamentary debate in May 2010, several members of the Riksdag raised fears that recruitment outcomes would become sensitive to the business cycle (Parliament of Sweden 2010). Similarly, the Armed Forces, in a report on long-term defence planning from 2007, identified economic booms as a major risk for recruitment opportunities and employee turnover (Swedish Armed Forces 2007).

A starting point in an economic analysis of the enlistment decision in a voluntary manpower system must be that those who desire to enlist prefer a military occupation to all other alternatives open to them in the civilian labour market. Economists typically operationalise the idea of preference (in this case for a kind of occupation) in terms of *utility*. The utility associated with a specific occupation depends, among other things, on the characteristics of the job as well as on the level of pay and benefits that come with it. From the perspective of an individual who is thinking about whether or not to enlist, the utility associated with the best alternative in the civilian labour market represents the *opportunity cost* of serving in the military. If civilian wages rise, or if the probability of finding a civilian job increases, the expected value of what an individual must sacrifice in order to enlist increases, all else being equal. Consequently, relying on volunteers, rather than conscripts, to staff the military force means that recruitment outcomes become more sensitive to disturbances from the outside world.

The assumption that individuals make choices to maximize their expected utility says little about the degree to which conditions in the civilian economy actually matter for the supply of people willing to work in the military, however. People are likely to differ in respect to their taste for military work. Individuals who are deciding whether or not to join the military can be seen as weighing their personal valuations of the non-pecuniary attributes of a military job against wage differences (Rosen 1974; 1986). This means that some will demand very lit-

tle monetary compensation in order to be willing to serve, whereas others will be very hesitant in choosing a military career, regardless of the money paid. Indeed, if people are highly polarized in the way in which they value the non-pecuniary aspects of serving in the military, there is little reason to suspect that changes in the attractiveness of civilian jobs should have a large impact on recruitment outcomes: volunteers will show up in roughly the same numbers regardless of expected earnings in the civilian labour market. On the other hand, if people are more homogeneous in their appreciation of military life, so that there are many people who are indifferent about choosing between either occupation, recruitment outcomes are likely to be more responsive to swings in the civilian economy (Rosen 1986; Warner and Asch 1995).

All in all, the potential effect of civilian opportunities on the supply of volunteers is an empirical question with important policy implications. Most military organisations depend on the steady flow of fresh recruits entering at the bottom of the military hierarchy to avoid problems in staffing the upper-level positions later on (Asch and Warner, 2001). Does the military have to worry about swings in the civilian economy? Should recruitment policies be active in the sense that they try to counter swings in the business cycle? Even though the transition to voluntary recruitment represented a major policy change, no published studies address these issues from a Swedish perspective.

The chapters in this thesis contribute to the literature by empirically analysing different aspects of military labour supply during the voluntary era in Sweden. Two fundamental questions are asked about the supply of voluntary labour to the Swedish Armed Forces. Does the state of the civilian economy determine the number of people who are willing to join the military? Does the state of the civilian economy determine the quality composition of those who volunteer? The rest of this introduction summarizes my attempt to answer these questions and briefly discusses the implications that follow.

2 Summary of the Chapters

Chapter [I]: Are Economic Upturns Bad for Military Recruitment? A Study on Swedish Regional Data 2011–2015

The transition to an all-volunteer force in 2010 coincided with a general improvement in the state of the Swedish labour market following the financial crisis. An understanding of how such factors influence recruitment is of considerable importance to military strategists in an all-volunteer environment. In the first chapter, I explore the relationship between civilian labour market conditions and the supply of labour to the military after the abolishment of the peacetime draft in 2010.

The effect of civilian unemployment on the rate of applications from individuals aged 18 to 25 to initiate basic military training is investigated using panel data on Swedish counties for the years 2011 through 2015. A linear fixed-effects

model is estimated to investigate the relationship, while controlling for a range of socio-demographic covariates and unobserved heterogeneity on the regional level, as well as aggregate trends on the national level. In order to allow for the possibility that changes in the application rate in a region might affect the unemployment rate of that region, the empirical analysis utilizes the variation in unemployment rates for older age categories, from which military applications are unusual, as an instrument for the regional labour market conditions for the youth population.

The results indicate a positive and statistically significant relationship between the unemployment rate and the application rate. More specifically, the results suggest that a one percentage point decrease in the unemployment rate is associated with a 0.3 percentage point decrease in the application rate. Given that the average application rate on the national level was 1.4 over the studied period, the results suggest that the civilian labour market environment in Sweden can give rise to non-trivial fluctuations in the supply of applications to initiate basic training within the Swedish Armed Forces. In estimating the effect of the civilian unemployment rate on the application rate, whether using a linear functional form, or not, or allowing the civilian unemployment to be endogenous, appears to be of little practical importance. Interestingly, however, the effect from the civilian unemployment rate becomes much stronger when the model controls for unobserved differences across regions.

Chapter [II]: Self-Selection and Recruit Quality in Sweden's All Volunteer Force: Do Civilian Opportunities Matter?

The results in Chapter 1 suggest that fewer individuals wish to join the military in Sweden when conditions in the civilian labour market improve. Studies from the U.S, on how the willingness to serve in the military differs between local labour markets, typically reach similar conclusions (see e.g. Asch et al. 2010; Asch, Heaton and Savych 2009; Simon and Warner 2007; Warner, Simon and Payne 2003; Ellwood and Wise 1987; Brown 1985). Little is known, however, about how the quality composition of volunteers responds to changes in economic circumstances. Do conditions in the civilian economy influence the way in which people select themselves into the military? Is the negative impact of a strong civilian economy on recruitment volumes exacerbated by a deterioration in recruit quality? In the second chapter, I explore these questions in the context of voluntary recruitment to the Swedish Armed Forces.

The chapter studies how local labour market conditions influence the quality composition of those who volunteer for military service. The empirical analysis is based on panel data for 290 Swedish municipalities over the years 2010 to 2016. The data set is created by averaging the IQ scores for those who applied for military basic training during this period across their home municipalities. A fixed-effects regression model is estimated in order to study the effect from local labour market conditions on the quality composition of volunteers, while

controlling for unobserved heterogeneity across municipalities.

The results show that poor labour market opportunities at the local level, as captured by civilian employment rates, tend to increase the mean IQ score of those who volunteer for military service, whereas the opposite is true if conditions in the civilian labour market move in a more favourable direction. The application rate from individuals with a high score on the IQ test is more responsive towards the employment rate in the municipality of origin, compared to the application rate from individuals with a low score: a one percentage point increase in the civilian employment rate is found to be associated with a two percentage point decrease in the share of volunteers who score high enough to qualify for commissioned officer training. Consistent with the view that a strong civilian economy favours negative self-selection into the military, the results suggest that the negative impact on recruitment volumes of a strong civilian economy is reinforced by a deterioration in recruit quality.

3 Why does it matter?

The empirical results from the studies in this thesis can be boiled down to one simple statement: conditions in the civilian economy matter for military recruitment outcomes. From the individual's perspective, it appears as if military employment opportunities might be an attractive alternative in poor economic times. On the other hand, the results imply that the Swedish Armed Forces will have difficulties attracting volunteers when conditions in the civilian economy improve. Adding to these difficulties, the results suggest that the negative impact of a strong civilian economy on recruitment volumes is exacerbated by a deterioration in the quality composition of those who show up.

The main lesson learned is that the Armed Forces cannot afford to be a passive bystander in a voluntary environment: recruiting strategies must apply active measures in order to offset shortfalls in voluntary recruitment associated with swings in the civilian business cycle. The government, however, has access to an extraordinary tool that is alien, at least in modern times, to other employers in the labour market: compulsory enlistment of people into military service. Consequently, in response to a deteriorating security environment and shortfalls in voluntary recruitment, the Swedish Government decided to re-instate peacetime military conscription from January 1, 2018, for both men and women. However, it must be emphasized that even after the re-instatement of the draft, attracting highly motivated individuals into the military must remain a priority for the Armed Forces. Since military service continues to be the starting point for a military career, there are strong arguments to be made in favour of voluntary recruitment for staffing and maintaining the professional branch of the military organization.

Even though the Swedish all-volunteer force turned out to be rather short-lived, the findings of this thesis highlight an important fact when it comes to staffing and maintaining a military force: the stronger the state of the civilian

economy, the higher the opportunity cost of allocating labour to the military sector. Whether military manpower is obtained by voluntary recruitment, or the use of compulsory conscription, is to some extent a question of how the costs to society of maintaining the military force are financed (see e.g. Friedman 1967; Hansen and Weisbord 1967; Oi 1967; Fisher 1969; Poutvaara and Wagener 2007). As long as the sizes of cohorts are substantially larger than the demand for military labour, there are important opportunities to limit the societal cost of the draft. The difficult task for the military selection system is to balance the needs of the military with individual opportunity costs and preferences. The results from the chapters in this thesis suggest that this balancing act is especially warranted in economic upturns.

References

Asch, B. J., and J.T. Warner. 2001. "A Theory of Compensation and Personnel Policy in Hierarchical Organizations with Application to the United States Military". *Journal of Labor Economics*, 19 (3): 524-562.

Asch, B. J., P. Heaton, and B. Savych. 2009. *Recruiting Minorities: What Explains Recent Trends in the Army and Navy?* RAND National Defense Research Institute. Santa Monica: RAND Corporation.

Asch, B. J., P. Heaton, J. Hosek, F. Martorell, C. Simon, and J. T. Warner. 2010. *Cash Incentives and Military Enlistment, Attrition, and Reenlistment.* RAND National Defense Research Institute. Santa Monica: RAND Corporation.

Brown, C. 1985. "Military Enlistments: What Can We Learn from Geographic Variation?" *American Economic Review* 75 (1): 228-234.

Ellwood, D. T., and D. A. Wise. 1987. "Uncle Sam Wants You – Sometimes: Military Enlistments and the Youth Labor Market." In *Public Sector Payrolls*, edited by Wise, D. A. Chicago: University of Chicago Press.

Fisher, A. C. 1969. "The Cost of the Draft and the Cost of Ending the Draft." *American Economic Review* 59 (3): 239-254.

Friedman, M. 1967. "Why Not a Volunteer Army?" *New Individualist Review* 4: 3-9.

Hansen, W. L., and B. A. Weisbord. 1967. "Economics of the Military Draft." *Quarterly Journal of Economics* 81(3): 395–421.

Lindberg, M. 2019. "Why Sweden Suspended Military Service: The Policy Process from 1990 to 2009." PhD diss., Lund University.

Oi, W. Y. 1967. "The Economic Cost of the Draft." *American Economic Review* 57 (2): 39-62.

Parliament of Sweden. 2010. Minutes of Chamber Proceedings 19 May 2010. Parliamentary Record 2009/10:121, § 5.

Poutvaara, P., and A. Wagener. 2007. "Conscription: Economic Costs and Political Allure." *Economics of Peace and Security Journal* 2 (1): 6-15.

Rosen, S. 1974. "Hedonic Prices and Implicit Markets." *Journal of Political Economy* 82: 639-651.

Rosen, S. 1986. "The Theory of Equalizing Differences." In *Handbook of Labor Economics*, vol. 1, edited by Ashenfelter, O., and R. Layard. Amsterdam: Elsevier.

Simon, C. J., and J. T. Warner. 2007. "Managing the All-Volunteer Force in a Time of War." *Economics of Peace and Security Journal* 2 (1): 20–29.

Swedish Armed Forces. 2007. *Rapport från perspektivstudien hösten 2007 – Ett hållbart försvar för framtida säkerhet* [Report on long-term defence planning autumn 2007]. Swedish Armed Forces Headquarters, Document no. 23 382:63862.

Total Defence Service Commission. 2009. *Totalförsvarsplikt och frivillighet* [Total defence duty and voluntary recruitment]. SOU 2009:63.

Warner, J. T, C. J. Simon, and D. M. Payne. 2003. "The Military Recruiting Productivity Slowdown: The Roles of Resources, Opportunity Cost and the Tastes of Youth." *Defence and Peace Economics* 14 (5): 329-342.

Warner, J. T., and B. J. Asch. 1995. "The Economics of Military Manpower." In *Handbook of Defense Economics*, vol 1, edited by Hartley, K., and T. Sandler. Amsterdam: Elsevier.