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Does Mr. Anderson have a job after the military has left?

– An investigation on unemployment rate in Swedish municipalities affected by a military closure

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Abstract

The purpose of this study is to investigate if a military base closure has any effects on unemployment in the affected municipality. In this study military base has been viewed as a cluster for the municipality where resources, infrastructure and employment in the municipality are drawn to maintain the base. When a shutdown happens they are viewed as a negative exogenous shock for the municipality in labor demand. The method chosen this study was a regression analysis based on panel data between the years 1996 to 2011. The sample covers municipalities which had or has a military development in Sweden during the period. The model which was used was based on region growth with factors of scale and agglomeration economics, also factors that effects unemployment such as income and human capital. To check if a shutdown had any effect on the unemployment rate a dummy variable was used which turned 1 at the year the closure happened and was 1 for the rest for the period when the base was closed. The overall main results indicate that a shutdown has a negative effect on unemployment rate in the affected municipality but it is on a low economic significance. Also, the results suffer from autocorrelation which makes the result not so valid along with problem of data. For further research it is suggested to investigate with micro data or the more reasonable do a case study on one municipality or several to investigate the effects of political decision after a closure.

Keywords: Regression analysis, Panel data, Military base closure, BRAC, unemployment, Region growth model

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1.0 Introduction

In recent decades after the Cold War the Swedish government has done big cut downs on military spending, today's military spending is 55% of what it was eighteen years ago (SPIRI¹; own calculations, see table 5 on p. 34). Because of this lesser demand for military the Swedish military force has downsized and several military bases have been shut down or have been merged with other units.

Since 1996 there have been several military base shutdowns which have affected 41 municipalities in Sweden which is about approximately 12 % of the municipalities and 39 % of the population in 2013 value (see table 9 on pp. 40-41; SCB, 2013; own calculations).

The place where the military bases have been build up is often chosen because of it's strategically significance from a military view point view and some municipalities have been created around the military base. One example of this is Karlskrona which became the new main base for the Swedish navy (NE, 2014). Also, it is often the case that a military base is the second biggest employer in the municipality except for the local welfare services which are provide by the public. Thereby a shutdown of the military base would be considered a great negatively shock on labor demand in the municipality and maybe the other municipalities around. So, the question is what happened to all these people and their jobs when the base was shut down? Is unemployment higher compared to the municipalities were the Swedish military forces still have their military base(s)?

The purpose of this study will investigate if the affected municipalities have a greater unemployment in comparison to those municipalities that still have military bases. This will be done by doing a regression analysis based on panel data from 1996 to 2011. The overall main results from the regression analysis indicate that the unemployment rate is lower because of a military shutdown. But, the result is suffering of autocorrelation which make the result not definite.

To start it can be conclude that military base closures are not a popular subject for economists to investigate. For example, Hooker & Knetter did a study in 2002 where they concluded "it would seem important to evaluate the economic cost of past closures. However, it appears that

¹ SPIRI (Stockholm International Peace Research Institute) an independent institute which is researching in peace, conflict etc.

little such analysis exists: a search in *EconLit* found only 11 entries for either “base closures” or “military bases”, with none of the referenced articles empirical” (p. 584). Today 13 years later a search on “military base closures” on *EconLit* gives 21 hits (done on 2014-04-27), where the vast majority doesn’t have anything with military base closures at all. To just say military base closure is misleading here and in most of the previous studies the technical term BRAC is used. BRAC stands for “Base Realignment And Closures” which also includes a movement of a regiment to another places which in reality means a shutdown for the community where it was. In overview, previous studies can be divided in three different parts. One, where they look at regional growth indicators (for example Andersson, Lundberg & Sjöström (2007)) and second, they look at effects of employment (Hooker & Knetter, 2002) and third, there are case studies of what has happened afterwards where they look at region level (for example Hill (2000)).

There is one study about military base closure in Sweden by Andersson, Lundberg & Sjöström (2007) where they look at the effects of military base closures in 1992 and 1994. The effects they analyze are net migration and income with a model based on regional growth with a two staged least squares. In their study they cannot find any indication that a military base closure has any effects. So this could mean that a military base closure does not have any effects on unemployment by assuming that income is highly correlated to unemployment (Sorensen & Whitta-Jacobsen, 2010, s. 374). In this study, unemployment will be considered as the dependent variable with another method. Also, as they are saying, because of the time period they are investigating they miss a lot of military base closures which was made after 1994 when the big cuts on military expenditures happened which makes this study interesting because it covers what happened after 1996 (Andersson, Lundberg & Sjöström, 2007).

There are two previous studies that have been found which directly look at unemployment in Germany by Paloyo, Vance & Vorell (2010) and (Moore & Spitz-Oener, A. (2012)). In Paloyo, Vance & Vorell (2010) they are using GIS to create their sample area to see if any BRAC has any effect. In their results they conclude that they could not find any large economic impacts of military base closures and for unemployment the effects are insignificant. In their conclusion they point out that in comparison to American military the German bases are smaller so a shutdown does not have the same significant effect which also could be the case for Sweden. But, a working paper by Moore & Spitz-Oener, A. (2012) where they are only focused at American bases in Germany they find that unemployment will have a higher and having a persistent effect. In their study they use a different method and an

earlier time period so they are not strictly comparable. So, there cannot be a clear conclusion on what BRAC: s will have on unemployment; it will differ depending on time and method.

The more common subject is to investigate the effects of employment level instead of unemployment level when a closure occurs. In the US, all the studies are about BRAC: s but at different time periods. The studies are based on access data that contains employee lists on each base. When dividing them into groups, they often divide them into three groups: officers, civilians working at the base and civilians working outside the base. Because of this they can trace if a shutdown has different effects on civilian working outside the military base versus civilian working on the base (and officers).

One of the earlier ones which has been found is by Krizan (1998) which is investigate employment growth in California and employment from 1989 to 1996. His results indicates that the net establishments is negative after a closure but for employment growth it is positive; it is easier to find a job after the closure but there will be fewer firms in the community. But also, he points out that there is a low economic significance so the change in military personnel indicates not to having a large impact.

The study from Hooker & Knetter (2001) is one of the popular one which every study discussing military base closures with a regression analysis does cites. The study looks at BRACS from 1970 to 1994 and look at employment and income. The method they used is at first a “what if nothing happened scenario” and compares it to what actually happened. After that they run a regression analysis with the dependent variables mentioned above. Their results indicate that employment is higher in places where a closure has happened in comparison to places where the military bases still exist, which as they say is the same for Krizan (1998). For income they cannot find any statistical results that indicate any change. So, their overall main conclusion is that a closure does not have a significant economy effect.

In what can be viewed as a follow up Hultquist & Petras (2011), which has the best literature review, they investigate BRAC: s in the period from 1977 to 2005. As method to capture closure effect they are using dummies. One thing that distinguishes this study from the others is that they believe that there are spillover effects when a closure hits the communities around so they look at employment effect also in the neighboring communities. What differs here, from previous, result is that here employment is positive correlated with changes in military personnel: when the number of military personnel decreases it also means that local

employment also go down. The results is also indicating that a neighborhood county is also affected but with a smaller economic significance.

The last study about employment that will be mentioned here is Poppert (major in the air forces) and Herzog Jr. (2003) where they investigate private employment from 1978 to 1997 with the effects on military installations and BRACS. Their results indicate that a closure has negative effect on employment in the local county area; they described it as “catastrophic job losses” (p. 480).

Another point of view to study military base closures is to do a quality study by doing case studies and see if the applied theory matches. As an example, Hill (2000) has done a case study where she looks at a specific closure in Florida and an analysis of what happens aftermath concerning job creation. One of her conclusions is that it requires good public participation mechanisms to let the local people get involved and the local government should develop their own intuitions and not rely on consultants. The reason why is that redevelopment of a military base to a civilian structure can take a long time, in this case it took decades. Another example of study so has Tzfadia, Yagil and Oren (2010) who have looked at policy implications when moving military bases to the periphery of Israel where there is Bedouin-Arabian majority. In their paper they use a methodology based on IPA (interpretive policy analysis) which they believe is a good methodology which will help scholars and also help assist policymakers when interacting with the society and activist. But as they say this relocation program cannot be predicted without taking into consideration e.g. culture or political values.

To summarize, we can see in the previous studies that the results are really mixed (nothing, positive and negative) and that there is no clear consensus on what an impact a BRAC has for impact on employment/unemployment in the local area. The theory says in all of them that a closure should have a negative effect but the actual results differ depending on the chosen time period and sample. So there is no overall main conclusion which can be drawn with the exception of using dummies for a closure and capture place/time effects.

For the rest of this paper it will be dived in at: Firstly, there will be a short history review of what has happened to the Swedish military forces in the last decades to provide context. Secondly, there will be a discussion of the theory that this study is based on which is a region growth model and human capitals effects on unemployment along with the model which will be used in the regression analysis. Thirdly, the empirical results will be discussed; the method

and the panel data used will be discussed, but also the results will be provided along with how the results have been deducted and what the results indicates. Finally, this paper will end with a concluding summary with points on further research in this subject area focusing on Sweden.

2.0 Background

2.1 Military in Sweden a short history

In 1996 the Swedish military forces was in an after period of The Cold War. The forces were built on a military doctrine called invasion defense. This meant that the forces were prepared for an invasion (in reality the Soviet Union) that would be stopped at the Swedish border. This required bases spread over the entire country and lot of military personnel which was run by civilians, officers, reserve officers and conscripts. Conscripts and reserve officers could be taken out on repeated training to practices their military training years after their military services (Swedish Military Forces, 2014a; Örlogsboken, 2003, pp. 328-332). For comparison see table 5 on p. 34 where Sweden military spending in relation to GDP with the neighboring Nordic countries and also Russia and the US. There we can see that military spending is at same level as Sweden's neighbors (except for Finland which is lower during most of the period). So, there are no main differences between the Nordic NATO-members and the non-NATO-member Nordic countries in spending. But, in comparison to the super powers the spending is much lower.

After the cold war the threat level against Sweden dropped and the military doctrine changed to an operational defense with contracted soldiers instead of having military service. With the operational defense the doctrine is that forces are now put in a small area conflict before it escalates into a full conflict within the country or as it has been historically, abroad in peacekeeping operations (Swedish Government, 2014a).

Because of all this, it became a much lesser demand for military forces and by that much lesser need for men to do military training which for example the Swedish government said in 1996 in their proposition of defense (Swedish parliament, 1996). So to adapt to the new situation the Swedish military forces started to shut down, merging units or moved them to cut in costs.

2.2 Shutdowns

The process of a shutdown starts in the committee on defense where they discuss the long term military threat against Sweden and hand out a determination which will decide the defense policy for the next defense determination.

In the defense committee, there are members from all parties represented in the Swedish parliament, experts in security/defense and members representing the government. The period to next determination varies but in this period it was every fourth year with the exception of the last on which was postponed one year (1996, 2000, 2004 & 2009). But because of a parliamentary system it is the Swedish governments who gives propositions to the parliament and executes what the parliament says to the Swedish military forces that then follow the new directions (Swedish parliament, 2014b).

So, the process from political decision on how the national defense should be, to closing a military base takes time, in some cases up to several years. But in general this can be viewed as exogenous shock which is affecting the municipality because the committee makes their decision on defending Sweden, not as governmental regional program.

A list of municipalities and shutdown/movement of military bases can be seen in table 9 on pp. 44-46 By a comparison to how the forces are organized today is what has happened is that the navy and the air force is now concentrated on few places. For the army what has happened is that there in general only one regiment of one kind instead of several outspread in the country (Swedish military forces, 2014b). To investigate how many people that have been affected in total, the total official number of employed civilians and officers in 2001 was 21.000 people and in 2011 it was 16306, a reduction about 22 %, taking into consideration that the population has also grown during the same time (Annual year report 2001;2011;own calculations).

The dismissed of officers in the military closure were offered a three year salary and some officer were offered an early retirement at an age of 55 (Annual year report of Swedish military forces 2001 & 2002; Swedish parliament, 2000, see Swedish military Forces, 2014b).It has also been found that the civilian personnel who was 58 years old and older was also offered an early retirement deal (Annual year report of Swedish military forces 2003 see Swedish military Forces, 2014b). The Swedish politicians were also aware that these shut down would affect the municipalities so there was some reorganizing of institutions. One example is The Swedish National Heritage Board which the government moved some of its institutions to Gotland (SR.se, 2005). Another example of their awareness was that they created a company which purpose was to change the military bases into civilian purposes (Vassalen, 2014).

3.0 Theory

3.1 Military base from a theoretical perspective

What impact does a military base have on a municipality? The previous studies are drawing some common conclusions. Firstly, a military base closure can be viewed as governmental subsidy for labor in the region area which will rise the labor demand (Palyo, Vance & Vorell, 2010). Secondly, the base will require some supplies which will be bought from the local area. Also, a company which handles military material wants to be close to the base to reduce cost which will also stimulate employment (Palyo, Vance & Vorell, 2010; Krugman, 1991). Finally, a military base stimulates the infrastructure; the base will have a need to easily move materials and troops easily from the base. But also, more commonly as Andersson, Lundberg & Sjöström (2007) say that it will stimulate to have favorable opportunities to commute in the region and domestic. Especially in Sweden because all the people who did military service had the right to travel home at the weekends for free. And with good infrastructure it will stimulate the region's growth and thereby by diminishing the unemployment rate. So in all, a military base is a positive stimulator for job creation and for economic growth.

So, as (Palyo, Vance & Vorell, 2010) says it will create a negative demand shock for the region when a base is closing/moving away from the region. The direct effects will be that the military and civilian personnel will lose their jobs and the indirect effect is that there will be a negative consuming shock which will occur in the region because there will be fewer persons who will be available to spend money on groceries, restaurants etc. But, as (Hooker and Knettel, 2001) says, the governments are often well aware of the negative decision it creates. So there is often governmental program which will help to restructure the base for civilian purpose or with other programs which will help to create jobs (for Sweden see p. 10). But, it will take years before the helping programs will have a full effect and the negative shock might be persistent. This is why it is interesting to see what an impact a closure has on unemployment rate and if the government's help program is working.

3.2 Regional growth model

Before the empirical analysis is presented, this paper will go through what makes some regions not only have a higher growth than others but also a lower unemployment. In this

paper, it will be argued that the reason for this is agglomeration economics. Agglomeration economics can explain what causes urbanization and why companies that is in the same business want to be close to each other. In the rest of this sub-section, I will first, explain agglomeration economics that is part in new economic geography which will also be explained. I will also add what impact a cluster has for an economy. Secondly, I will apply this by having a short overview of models which are based on the new economics geography which is focused on why some places will have a lower unemployment than others and vice versa.

The history of agglomeration and economic geography is going to back to the 19th century with von Thünen (Mäki, 2014) who constructed a model of why cities exist. One of the reasons why they exist and why some expand is by assuming different demands for farming and for housing in land rent. In 1948 Hoover release a general book of economics which is often regarded as one of the first of who discussed about agglomeration where concentration of business will create spillover effects which would lead to a higher production (Krugman, 1991).

In 1991 Krugman release a paper which many of the new economic geography is based on. In the beginning of the paper he talks in general of the effects of agglomeration and states three assumptions. First, because firms with their specialization want to allocate near each other; it will create a common pool market for labor where it will be easier to find right worker and it will also lead more probably to a lower unemployment. Second, “localized industries can support the production of nontradable (sic) specialized inputs”. And the last is that with a cluster a spillover effect will be created that will help maximize production to give more revenue.

But furthermore, Krugman expand this by arguing that by augmenting that there is also something called pecuniary externalities which do not includes the technological spillover effect. In his paper he creates a model which has two regions which to kinds of goods agriculture goods produced by peasants and manufacturing products by workers who are allowed to move between the regions. The conclusions of his model is that there will be a tendency for the manufacturing firm to be concentrated if transportation cost is low. The reason why that is these pecuniary effects which says that the manufacturing concentration will create a higher demand for their products because of sharing the same scale effects where it will be cheaper buying inputs and creates a larger demand for the output. A firm who wants

to defect and move to the other region has to offer a higher wage to attract workers which will lead to companies output being more expensive and not be bought if the output plus transportation cost are lower in the other region.

Florida (1995) has a more practical point of view in comparison to Krugman whose paper is strict theoretical. In his paper which is influenced by the 90's when the globalization really started running in the world. He states, besides of what have been said before about agglomeration economics, that the regions which are human capital intensive (he calls it learning regions) will have a higher growth. He claims that it is a new world in which manufacturing is more knowledge intensive and that workers with good human capital will connect with R & D to improve the products at a lower cost. With the globalization it will be more important with foreign direct investment (FDI) and multicounty ownership in transplant manufacturing which will stimulate more in better production. In addition, what he also claims in his paper is beside of that there should be investment in traditional infrastructure it should also be investments in human capital investments to become a learning region where it is easy to get information and continue learning to improve the human capital so the companies will be knowledge creators where new and better products will be created.

Finally, Porter (1998) discusses, from a theoretical perspective, why companies want to agglomerate. The reason why is because of 'clusters'. By Porter's definition "clusters are geographic concentrations of interconnected companies and institutions in a particular field" (p. 78). He also claims that in a cluster it is often a governmental presence in that area that supports the cluster by for example having a university which is specialized in the field of the cluster. In the paper there is a focused on manufacturing production but as an example he uses Portugal to map out different clusters and one of these clusters is focused on tourism, so it does not have to be strictly a manufacturing concentration of companies but it could also be service. This paper will only glance at what benefits a cluster can create. But in general, in a cluster the companies are benefitting from both in cooperation and competition which in turn stimulate new or better products within the field. The reasons why is that in a cluster it will be easier to get specialized information and it will be easier to hire labor and the right inputs for a lower cost. The companies can also be complements to each other and it will also be stronger rivalry to perform better products which will stimulate innovation.

So in conclusion, these papers are arguing that there are benefits for companies to be close to each other and it will favor cities which are specialized on a specific field, are human capital

intensive and when transportation cost is low. These regions will have an increase in population and will become larger in economic growth. But the problem with these theories is that they are focused on manufacturing and not on service which a military base are; they provide security to the country. But still, as said before a military base will need supplies which can be argued from Krugman (1991) statements of agglomeration theory is that in allocation theory should be close to the military base and thus promote production in military goods. But on this case for Sweden, it is not argued that all these military bases are clusters. Maybe it is for regiments which require high skilled workers to maintain the vessels (the Navy and the Air forces). Hooker & Knetter argued that the air force civilian workers would have it easier to get new employment when a base is shut down.

These papers above are focused on regional growth which agglomeration economics with scale effects stimulate the economic growth. But they are not specifically models focused on agglomeration and unemployment as we are going to do now. In the models they use they will as Krugman (1991) did begins with a two region model where it is produced two kinds of goods (often agriculture and manufacturing goods) are produced and where they connect labor and unemployment with a specialization.

Francis (2009) is doing this and has a “Schumpeterian” perspective in meaning of creative destruction in products and on job creation. In his results he concludes that if the regions are the same it will be a common equilibrium and if there is a high trade cost there will be not any migration to the other region. However, if a difference arises, e.g. one region becomes bigger than the other the bigger region will have a higher real wage according to Francis and this will create a push for the people in the smaller region to migrate to the bigger one that will create a higher job destruction but also higher job creation which will lead to higher productivity and thereby higher wages. For unemployment it will be lower in the bigger region if the job creation is higher than the job destruction. Another paper written by Zierahn (2013), which show a fairly equivalent tendency that is: people who live in agglomerated regions have a higher wage and a lower unemployment . But the assumptions are different and hence the conclusions vary. Also in this paper Zierahn argues from a real effective wage. The reason as to why there will be a lower unemployment in the center is because of the higher real effective wage and this will create a less desirable to shirk because since it is too costly to lose the job. They both agree on that lowering transportation cost will increase the agglomeration effect.

One other paper that does not draw exactly the same conclusions is from vom Bergge (2013), except about the effect of transportation cost. The reasons are vom Bergge is using an imperfect model and from one point of view in analyzing the outcomes of the model it will be a higher unemployment in the core and also lower nominal wages. The reason is that transportation cost which will be high to commute out in periphery in and because of a higher concentration of people in the core it will lead to a higher competition of fewer jobs which will lead to a lower wage and more people out of work. Another conclusion of migration to another region is people will have less intend to migrate if the region they live in has high unemployment it will distract them to move and secondly because of relative high unemployment the factories will easier find right people for vacancy and they will accept a lower wage because as a result of a high unemployment. This will lead that the firms will have an increased profit because of reduced production cost because of lower wages and of lower vacancy. Because of this higher productivity this will stimulate people to move to the region.

To summarize in total of the region growth model, the models argue that people who live in a bigger city benefit it is easier to find work, or through a firm's perspective to find workers due to scale effects and agglomeration economics. Also, spillover effects will create a higher productivity and a lower unemployment. What a government can do to stimulate this is to increase the human capital and spending on infrastructure in communication, accesses to information but at most on traditional infrastructure which will promote people to migrate to places where there is opportunities growth which will lead to higher wages and lower unemployment.

3.3 Unemployment factors

“Who are the jobless?” asks Topel (2008) in his summary article on unemployment. According to him it depends on the level of skill each person's has. If you are a high skilled person you will easier get a work, but persons who are unskilled will be more vulnerable to shocks on the labor market and will be get a higher probability to be unemployed. Moreover, he claims that this has been increased in the labor demand that is the demand of skilled persons has increased in relative to unskilled which had given higher wages and a lower unemployment. Other factors that can take part in but will not be considered due to lack of data in the estimated model is immigrants which according to an OCED paper by Pedersen & Westergird-Nielsen (2013) have in reality a higher unemployment. One of the reasons could

be the lack of language skill and thus makes it harder to receive a work. Another factor that the OCED paper addresses that could be considered is that there through a global point of view that females has it harder to get a work and get on the labor market.

In this paper there will be two factors of unemployment which will take part in the estimated model, those two are GDP which (as mentioned earlier) is highly correlated with unemployment and human capital. Human capital is often recognized as a skill factor called the market signal theory, which is based on adverse selection. In a paper done by Spence (1973) in short, he claimed that there exists asymmetric information on the labor market, which makes it hard for employers to find right skilled employee. The employee who wants to have the job and is skilled cannot be distinguished from the others because there is asymmetric information for the employer. So, the solution for the employee is to signal that he is skilled by taking an education to prove it. Spence points out that this education from a society point of view is not optimal but due to lack of full information the employee have to take an extra cost to signal that he is high skilled which the low skilled will not.

3.4 Theoretical model

This study applies a regression analysis method and will use a model based on region growth model and unemployment factors which has been described here above. The model which is used is described down here in equation 1.

$$UNEMP_{it} = \beta_0 + \beta_1 CLOUSERE_{it} + \beta_2 INC_{it} + \beta_3 POPDENS_{it} + \beta_4 HUMCAP_{it} + \beta_5 YUN_{it} + \beta_6 OLD_{it} + \beta_7 NETMIG_{it} + \beta_8 TAX_{it} + \beta_9 EXP_{it} + \beta_{10} TIME_t + \beta_{11} PLACE_i \quad (1)$$

$UNEMP_{it}$ is the dependent variable and stands for unemployment in the municipality. $CLOUSERE_{it}$ will be a dummy variable which purpose is to capture the effects of a military base closure. An effect of a military base closure should have a negative effect by as said before that a closure will affect more than the military personnel by there will be a less demand for consumption and a decreased demand for labor (for example see Hultquist & Petras, 2012). INC_{it} stands for income for the whole municipality (GDP) and it should in a theoretical point of view have a negative effect because increased income (GDP) leads to a lower unemployment, for example see Sorensen & Whitta-Jacobsen (2010, s. 374) which show it is procyclical. $POPDENS_{it}$ is the population density and it is used as a regional character. Because it is a regional character it is not directly to have an effect but it should be negative. The reason is because the theory of agglomeration economics which says that in a

more urbanized municipality it will lead be easier finding right workers and more effective workers (Francis, 2009). $HUMCAP_{it}$ stands for the human capital in each municipality and it is suspected to have a decreasing effect. Persons with higher human capital tend to have lower unemployment because they are assumed to be more productive (Florida, 1995). YUN_{it} and OLD_{it} stands for how many young respective olds are in the municipality. OLD should be positive in meaning that as pensioner you have a lower income and thus a lower consumption which would mean lower unemployment. Young should be negative in meaning that it is more likely that is more working parents in the municipality and thus a higher consumption. But it is a region character which Palyo, Vance & Vorell, 2010 have in their estimated model. $NETMIG_{it}$ stands for net migration which is a regional character for the municipality. It should also have a negative effect by the same reasoning as said about agglomeration economics in YUN_{it} and $POPDENS_{it}$. TAX_{it} is an income tax which is used to finance public expenditures in the municipality and the region which it is in. It differs from each municipality and the variable is used as a region character. An increased tax should have a positive effect by the assumption that it will lead to an increased welfare loss in consumption and thus a lower demand for labour (for example see Andersson, Lundberg & Sjöström (2007)). Finally, EXP_{it} is the level of public expenditure in the municipality and it is believed to be negative. The more that can be expanded will lead to an increased demand of consumption and demand for labor (for example see Andersson, Lundberg & Sjöström (2007)). The model will also contain place and time dummies ($TIME_t$ & $PLACE_i$) to capture if each municipality and time period has any effect, which for example Krizan (1998) uses in his study by using time dummies.

4.0 Empirical analysis

4.1 Method

The method that has been used is a regression analysis based on the model that has been described in 3.4 (pp. 16-17). The data is a panel data set that cover the municipalities which had a military base and it will be further described below in section 3.2 All the regressions has been run in EViews and the approach has been started with a slimmed model to test up if the other variables are significant in OLS. It has also been run with a fixed effect model to check for robustness. Moreover, it has been tried with a smaller sample because of changes in the data and also with a sample without the biggest municipalities and one municipality that were believed as a special case (Arvidsjaur). All the results can be seen in section 4.3 from page 21.

4.2 Data

All data that has been used is brought from Statistic Sweden's "Statistikdatabasen" (2014), the only exception is the data measuring unemployment which is from Arbetsförmedlingen. Arbetsförmedlingen (2014) is the Swedish public authority who is responsible for placement service, help increase competence for those that are unemployed and also, they are also required to track how many are unemployed and where they are registered. The data is panel data on municipality level which covers those who had or has a military base in the period which is 1996 to 2011 which gives observations of 656.

One of the limitations of this study is the length of the data and data on municipality level. This makes the originally purpose to capture just before the cold war ended cannot be done but it will start at 1996. But, still, the big cut downs on military started in 1994 (see Figure 1 on page 36) and many closures of military bases or movements were made between 1996 and 2005 (see background for more discussion). So it still captures most of the changes in the Swedish military forces when shifting military doctrine.

The dependent value is unemployment and it is valued in decimal form and is the sum of registered unemployed and those who are in work related programs which Arbetsförmedlingen is registering in the end of each month. Because of this, it will not catch up all unemployment in the municipality (especially those who are latent unemployed) and deviates from international standards. It could be that a person who should be recognized as

employed in international standard is here registered as unemployed. Still, this is closely as it can get on municipality level and these are persons who is actively is searching for jobs (Statistic Sweden, 2014c).

The dummy CLOSURE is the dummy variable, which gets active in the year for the municipality when the head military base is shut down and then gets one for the rest of the period, otherwise it is zero. There could be or are still military presence in the municipality through a detachment for example the Swedish Navy control or as more common the Swedish National security forces the Swedish National security forces (Hemvärnet) (Swedish military forces, 2014c). But, then personnel are few and cannot be counted as a big factor for labor demand in the municipality. List of the municipalities that are used in the data and the affected municipalities can be seen in appendix on pp. 44-46. The information is brought from the annual reports, which the Swedish military forces are giving each year, which is opening online, documented from 2001, and forward. Closures before 2001 has been consulted what earliest annual year report says, reports from Swedish defense committee and 1996 defense proposition from the government along with a web page which had information about old Swedish regiments which is confirming what the official public documents says and are regarded as trustworthy (Swedish Parliament, 1996; Swedish Armed Forces, 2014b; Hultman, 2014).

As said before, there are some limitations access to data on municipality level which is income level and unemployment. There are no official data of income level on municipality level so an approximation has been used by take GDP on region base level, then multiply it with the fraction of municipality in the region (see equation 2 below) and take with per capita. This approximation is not fully truthful because all the municipalities are not behaving the same and will generate different levels of income. So this variable can be seen as the municipality's share of the region GDP. The municipality GDP is valued in Swedish crowns at per capita with prices at 2004: s value.

$$\left(\text{Region GDP}_i * \text{GDP deflator} * \frac{\text{Municipality population}_i}{\text{Region population}_i} \right) * \frac{1}{\text{Municipality population}} \quad (2)$$

The rest of the variables can be described as for human capital it has been used a proxy variable which is the municipalities' share of people who have at least a 3 years studies in university. For expenditures it is valued as per capita in Swedish crowns and it has been divided with a GDP deflator to get it at 2004 prices. Old and young are measured in

percentage of the people who are 65 and older respective 20 and younger. Tax is the income tax every person has to pay on their salary which will go to municipality and region expenses and it will differ from place to place in region and municipality where you live, it is valued here in decimals. The data of taxes contains a structural break. The reason is before 2000 all persons were forced to pay a church tax but in 2000 the church tax became mandatory and instead everybody is now forced to pay a burial fee which is much lower. But because this is happening to everybody it is believed this will not alter the results greatly. At last, net migration is the percentage change in population for each year for the municipality. The reason why so many of the variables are in percentage is because the municipalities are much heterogeneous so percentage is used instead when it is available to avoid hetreoskedactiy. A table which is describing the data with a highest (top), low (middle) and mean (lowest) value can be seen down here.

Table 1. Data description

Variable	Year	Municipality	Value
UNEMP	1996	ARVIDSJAUR	0,176842
	2008	Vaxholm	0,009465
			0,067864
POPDENS	2011	Stockholm	4617,9
	2010	ARVIDSJAUR	1,1
			226,311
NETMIG	2000	Vaxholm	0,04286
	1998	Södertälje	-0,09428
			0,004283
INC	2011	Uppsala	2811068
	2011	Haninge	961,5233
			339181,7
OLD	2011	Kristinehamn	0,683475
	1996	Haninge	0,091703
			0,191663
YUN	2008	Vaxholm	0,295059

	2008	Strängnäs	0,178528
			0,234625
	2011	Lund	0,269258
HUMCAP	1996	Söderhamn	0,036238
			0,106162
TAX	1999	Sollefteå	0,3412
	2000	Stockholm	0,279
			0,317518
EXP	2010	Arvidsjaur	50107,22
	1998	Vaxholm	24431,53
			35850,16

4.3 Result

4.3.1 Closure effect and proceeding

At first I start with a slimmed model with only the dummies, income, old, young, population density and net migration in OLS. Then, I test if the other variables are significant and see if the model is more efficient by running the slimmed model with another control variable, one by one. The results for all the extra control variables are showing significance and so I run the whole model with all the control variables (the result can be seen in table 2 on the next page).^(2 & 3)

The results there are indicating there that the closure dummy is significant and has a negative effect on unemployment in the affected municipalities. This is also valid for the other run OLS estimation the closure dummy gets significant but at different levels. But for the regression with all control variables the significance level is small and it is also small for the economic significance which is 0,004103. So, a BRAC in an affected municipality indicates

² All the estimations has been done with a white heteroskedasticitet covariance matrix because of earlier running's in an unstructured model showed heteroskedasticity in Breush-Pagan test and also by looking at the residuals they are clearly indicating that the model suffers of heteroskedasticity.

³ The coefficient is above and the standard error is in brackets. The significance level is represented by a *. *=10 %, **=5% and ***=1% level. J-B stands for Jarque-Bera test for normality and D-W stands for Durbin-Watson test for autocorrelation.

here not leading to an increased unemployment but at the opposite, unemployment goes down but only at a small level.

Table 2. Results with OLS and all control variables

VARIBLES	OLS SLIMMED	OLS SLIMMED WITH HUMCAP	OLS SLIMMED WITH EXPENSES	OLS SLIMMED WITH TAXES	OLS WITH ALL CONTROL VARIABLES
B ₀	0.023625 (0.028094)	0.015593 (0.028480)	-0.056731 (0.036070)	-0.111099 (0.040780)***	-0.118667 (0.044392)***
CLOUSERE	-0.004017 (0.001786)**	-0.003265 (0.001822)*	-0.003894 (0.002186)*	-0.004727 (0.001731)***	-0.004103 (0.002165)*
INC	-1.22E-08 (8.13E-09)	-1.39E-08 (7.19E-09)***	-9.35E-09 (9.82E-09)	-9.63E-09 (7.44E-09)	-7.55E-09 (9.03E-09)
POPDENS	-5.37E-05 (1.76E-05)***	-6.10E-05 (0.069916)	-3.31E-05 (1.85E-05)**	-5.36E-05 (1.82E-05)***	-3.87E-05 (1.98E-05)*
NETMIG	-0.083614 (0.0708429)	-0.060236 (0.063912)	-0.049485 (0.066210)	-0.076531 (0.061612)	-0.037273 (0.059690)
YUN	0.402346 (0.094814)***	0.374330 (1.90E-05)***	0.335968 (0.105435)***	0.383358 (0.093910)***	0.318783 (0.106537)***
OLD	-0.012972 (0.063137)	0.017752 (0.097360)***	0.021387 (0.068060)	-0.017637 (0.062154)	0.030629 (0.067525)
TAX				0.364698 (0.112521)***	0.306903 (0.118575)***
EXP			1.44E-06 (5.83E-07)**		1.31E-06 (5.91E-07)**
HUMCAP		0.146735 (0.063461)**			0.081625 (0.082433)
R ²	0.866489	0.867716	0.819334	0.869044	0.822192
ADJ. R ²	0.852778	0.853885	0.797499	0.855353	0.799923
AKAIKE	-6.232065	-6.238251	-6.306271	-6.248343	-6.315275

SCHWARZ	-5.808068	-5.807415	-5.829822	-5.817508	-5.823701
D-W	0.501463	0.509152	0.349008	0.512784	0.357291
J-B	278,09***	287.03***	145,88***	287,92***	176,7***
PLACE	YES	YES	YES	YES	YES
TIME	YES	YES	YES	YES	YES

To control if this result is valid I have done further regressions to check the robustness and by that I have controlled with running estimation with fixed effects in cross-section with and not with weights. The results are showed in table 3 and they are not showing any place dummies because of it was not possible. Here again, the results is also indicating that the closure effect gets significant and at different levels, 10 % with no weights and 5 % with weights. Also, the economic significance here is weaker in the regression with weights with -0,001961.

Table 3. Results with first difference and with fixed effects

VARIBLES	OLS, FIRST DIFFERENCE	OLS, FIXED EFFECTS, NO WEGIHTS	EGLS, FIXED, EFFECTS, WITHWEIGHTS
B ₀		-0.156469 (0.049169)***	-0.051325 (0.031320)
CLOUSERE	-0.000166 (0.002793)	-0.004103 (0.002165)*	-0.001961 (0.000804)**
INC	-6.12E-08 (2.27E-08)***	-7.55E-09 (9.03E-09)	-1.27E-08 (5.27E-09)**
POPDENS	3.64E-05 (4.54E-05)	-3.87E-05 (1.98E-05)*	-5.21E-06 (7.53E-06)
NETMIG	0.003687 (0.060880)	-0.037273 (0.059690)	-0.110822 (0.055850)**
YUN	0.322470 (0.293921)	0.318783 (0.106537)***	0.195815 (0.061256)***
OLD	0.591326 (0.167309)***	0.030629 (0.067525)	-0.048983 (0.028412)*

TAX	0.760560 (0.108644)***	0.306903 (0.118575)***	0.194548 (0.063376)***
EXP	-4.91E-07 (3.91E-07)	1.31E-06 (5.91E-07)**	6.67E-07 (2.46E-07)***
HUMCAP	-0.189724 (0.090530)**	0.081625 (0.082433)	0.033877 (0.055180)
R ²	0.168251	0.822192	0.932753
ADJ. R ²	0.155601	0.799923	0.924331
AKAIKE	-6.196013	-6.315275	
SCHWARZ	-6.123975	-5.823701	
D-W	1.678939	0.357291	0.666269
J-B	147.22***	144,6***	7,53**
PLACE	NO	NO	NO
TIME	YES	YES	YES

It has also been controlled with the sample because fundamental changes of the municipalities and regions have been made during this period. Knivsta did break out from Uppsala 2003 and Heby switched region from Västmanland region to Uppsala region in 2007. This is affecting valuing the share of region GDP and not a consistent Uppsala during this period. To check if this has any effects Uppsala, Enköping and Vasteras has been taken out from the sample and estimation with fixed effects and weights has been done which can be seen in table 3. The results are indicating that closure dummy is significant and is negative. Also, it has also been tried with an additional smaller sample by not having Arvidsjaur which has still a military presence in reduced form and the three biggest cities in Sweden (Stockholm, Gothenburg and Malmoe) which deviates heavily from the other municipalities. The results from here are that the closure dummy is insignificant.

Table 4 Results with smaller samples and with a log log estimation

VARIBLES	EGLS CONTROLLED SAMPLE	EGLS HARDER CONTROLLED SMAPLE	EGLS WITH A LOG LOG MODEL
B ₀	0.025443	0.016110	-4.931452

	(0.029622)	(0.033869)	(3.778401)
CLOUSERE	-0.001519	-7.40E-05	-0.052854
	(0.000821)*	(0.000885)	(0.020268)***
INC	-1.50E-07	-1.05E-07	-0.436533
	(1.77E-08)***	(2.19E-08)***	(0.139219)***
POPDENS	-1.98E-05	0.000426	-0.559353
	(8.39E-06)**	(0.000160)***	(0.482881)
NETMIG	-0.089729	-0.097406	0.018496
	(0.051151)*	(0.051475)*	(0.006841)***
YUN	0.158082	-0.022662	-0.597926
	(0.068406)**	(0.081990)	(0.422138)
OLD	-0.089177	-0.124899	-0.179049
	(0.030002)**	(0.038223)***	(0.172635)
TAX	0.086906	0.118459	0.622368
	(0.060139)	(0.066238)*	(0.465944)
EXP	9.12E-07	8.85E-07	0.695098
	(2.51E-07)***	(2.73E-07)***	(0.227502)***
HUMCAP	0.058140	0.081381	-1.079469
	(0.053021)	(0.056722)	(0.221167)***
R ²	0.939302	0.937729	0.926104
ADJ. R ²	0.931457	0.929278	0.913363
AKAIKE			
SCHWARZ			
D-W	0.749357	0.757435	0.879618
J-B	5,35*	6,47**	3,49
PLACE	NO	NO	NO
TIME	YES	YES	YES

One of the major problem is that all the run regressions is suffering from autocorrelation which is indicated by the Durbin Watson test which is the only test for autocorrelation which is available in EViews using dated panel. It has been tried to be resolved with using lags but that has not been possible because it is close to singular matrix. So the resolution which has been possible is to take first difference. The problem with taking first difference is that the entire place and the time dummies will not be available to take in the estimated regression. The results from the first difference regression can be seen in table 3 and the overall main results is that most of the variables including closure dummy are insignificant with the exception from income, old, tax and human capital. Plus the Durbin-Watson test is showing that the estimation still suffers from autocorrelation.

Finally, the last robustness check which has been made is to see if there is any difference by taking logarithm instead of absolute values. The final estimation is to run the whole sample in logarithm except for the dummies and run it with fixed effects with weights. By comparing the results with results from the EGLS estimation in table 4 it can be seen is that the log model has less significant variables but the closure dummy is still significant at a higher level of 1 % and the coefficient is slightly bigger.

So, with all these robustness check the results are not definitely clear that a closure leads to lower unemployment when considering making the regression stationary and clears the selection of the sample. But, both them are large intervention which will make it harder to find any statistical results.

These results of that a BRAC can lead to lower unemployment are unexpected in that way it is going against the theory of agglomeration connected with that a military base is a small cluster in meaning that both local suppliers, infrastructure, institutions and research is in some way dependable on its existence and flourish around it. If it closes then it would lead to a strong negative impact to the others. But, there are maybe other factors that I will list here that maybe make the results as it is.

One of the possible explanations is that the military has not fully left the municipality. As said my definition of a closure is that head base in the municipality has fully been shut down or moved to another municipality. So in some of the municipalities there are still some military presence left but at different levels. One example is the Arméns Jägarbataljon which is a detachment to I19 in Boden (Sydsvenskan, 2005). Before 2005 it was a separate regiment but was changed at last minute at the governments' proposition. On other example is the Swedish

navy control which head base is in Karlskrona but has/had company spread out over the country (Swedish Military Forces, 2014d; Officersförbundet, 2009). But the more common is that there are still people who are organized in voluntary defense forces such as the far common the Swedish home guard. They are organized by a core of staff people by officers and civilians at a local place but they answer under a regiment. In this study I did the assumption that it would not affect the results because they are so small units in relation to before and by the share of the population. So I have to consider that this assumption failed and it did have an effect. Also, this study does not take in that units can have been shut down or merged when still having a military base which also could have affected the results. For example, Boden in 2005 there battalions was shutdown still was not consider as a shutdown in the sample because the regiments I18 and A9 still exists.

One other reason was that the politicians was self-aware that these decisions would give a big impact when the regiment was closed so they tried with “rescue packages” in meaning moving institutions or parts of it to the affected municipality to dampen the effects and the public company Vassalen which purpose is to converting the military facilities to civilian use (see p. 10).

Finally, the other possible explanation that has been to consider is the net migration, 3 year severance pay upon termination and the earlier retirement offer to civilians and officers. By net migration is by meaning that the personnel who lost his job could have moved to another regiment or a totally another job. Maybe they didn't stay or for a long time in the municipality which would not affect the unemployment rate in the municipality. But this is not supported by the earlier investigation by Andersson, Lundberg & Sjöström (2007) which said that a closure did not affect the net migration. Still, as we have seen in previous studies the results depends in some way which time and which places they are studied. In comparison to their study the time period differs from this study so there could be a different behavior. But, this is considered at one of the less good explanation. As said, The Swedish Armed Forces offered an early retirement which would make the person a pensioner and not unemployed this will lead that these persons will never be showed up in the statistics of unemployment and affects the results.

4.3.1 Results of the other control variables

The use of the place and time variables is to catch up anything that makes the estimation as precise as possible. So in this paper there are not going to be any interpretation of the results but they can be seen in the appendix section with the tables 6-8 on pages 36-39

For the other variables it will be now a short summary of the result from see table 2-4. For income, the results who are significant are indicating that they affect negative on unemployment which are expected to basic macroeconomics which says that a GDP is highly correlated to unemployment.

For population density, the results are indicating that an increased population density will affect negative with the exception with the estimation with big clearing of the sample. Negative results were expected in according to agglomeration economics and unemployment. But also, the economic significance is really small. For net migration, it was also here the expected result that a negative impact on unemployment with the exception of taking logarithm estimation. It should also be point out that the result which were significant were based on when it was run with a fixed effects model. For young, we can see that it had a positive effect on unemployment and why it could be so depends on that young is the share of people who was between 0 up 20. By that this will affect unemployment in a positive way because of the youth unemployment which is much higher than the total unemployment (ekonomifakta, 2014). For old, it gets mixed result when estimating with OLS it gets positive but when estimating with fixed effects it gets negative. For taxes, the results are indicating to that higher taxes will lead to a higher unemployment which is expected. The results for expenses, are here unexpected in by meaning that a high public spending should lead to a lower unemployment but here the results are indicating that they are having a positive effect. At last, is the human capital which is getting mixed results. It has a negative effect when running it in first difference and in a log log model but it gets positive when it is run in a slimmed OLS with human capital.

By looking at the economic significance it is clearly that income, population density and expenses has marginal effects on unemployment while the other has in general larger but still small effects. Most of the variables are also behaving as expected or mixed in general with the exception of expenses which is going against the theory.

5. Conclusion and further research

So to go back to the overall question which was stated on the front page: Does Mr. Anderson still has his job when the military has left his hometown? The answer is that we cannot know for sure. The results of this study indicate that a shutdown or a movement of a military base does not lead to a higher percentage of people who are open unemployed or in work-related programs in affected municipalities. It even indicates that it is fewer people in comparison to those who still have a military base in their town. But problem of autocorrelation makes the results not fully trustworthy.

It can be concluded that there is no general conclusion which can be drawn for the whole world because of the same reason as said in the previous study were there are mixed results which says that a shutdown doesn't affect at all to it has a negative impact. The results depend heavily on which time period and the sample which has been chosen. It could be that there are other more important factors that affect at the same time which could affect the result.

In this study one of the limitations is the data where unemployment is one of the biggest factors which have been discussed in section of data. Because this study is using the sum of open unemployment and persons in work-related program, it does not catch up all the persons who maybe are or is not unemployed to international standard. So the result could do only catch up people who actively want to have a job and not does who are inactively. This could have an impact of the results in meaning that the real unemployment is higher and make the result underestimated. Also, this study does not include "what if scenario" if nothing was changed and comparing to what actually happened with unemployment which other studies has who had access to employment list.

On other limitations that have been said is the variable which captures the municipalities GDP which is not the actual but the share of the regions GDP of a proxy. It is highly expected that each municipality goes on different levels and not on a general level. So there is a scenario that in total the region GDP is increasing but the affected municipality has a decreasing GDP, which is a factor that not can be excluded.

On other problem, is the length of the data which does not cover the start of closing military bases which started in the fall of the Berlin Wall. So the sample is smaller than what it could be and could by those giving misleading results.

The final limitation, because of the complex of all the closing of military bases it has been used one hard definition which has led to those bases that has been shut down or merged are not consider in because there is still a military presence with a head base that is much smaller than it was before.

So in all, because of all of these limitations it could be that Mr. Anderson was fired because of the shutdown but this study was not available to catch it up along with problems of in-stationary data. Finally, with results as it is the indicate the same as Andersson, Lundberg & Sjöström that a closure does not affect the municipality and the reason can be the same as said before in the previous studies along with the absolute values of the military forces that they are not so big in relation to American bases, which means the base is too little to have any persistent impact.

For further research it could be interesting to look at region level to see if there could be any changes there. But, the Swedish regions are not homogenous, they deviate heavily in area and in population and also there are limitations in data which does not cover back to 1989. One other example, it if would it would be possible would if there could be access to micro data and follow persons what happened to them and then could investigate with more depend variables such as early retirement and risk of getting sick. At last, the most reasonable would be to develop a case study on few selected municipalities to investigate the aftermath the government policy with all the rescue packages and evaluates if it gave more jobs, gave the municipalities another direction. Further research

To clarify: This study is independent. No one from an institution, government office or private company has paid for or suggested this research. All the data is gathered from open sources. This study does not also arguing that a closure is a good or bad thing, it is only a study which is investigating about government spending and the effects on unemployment rate.

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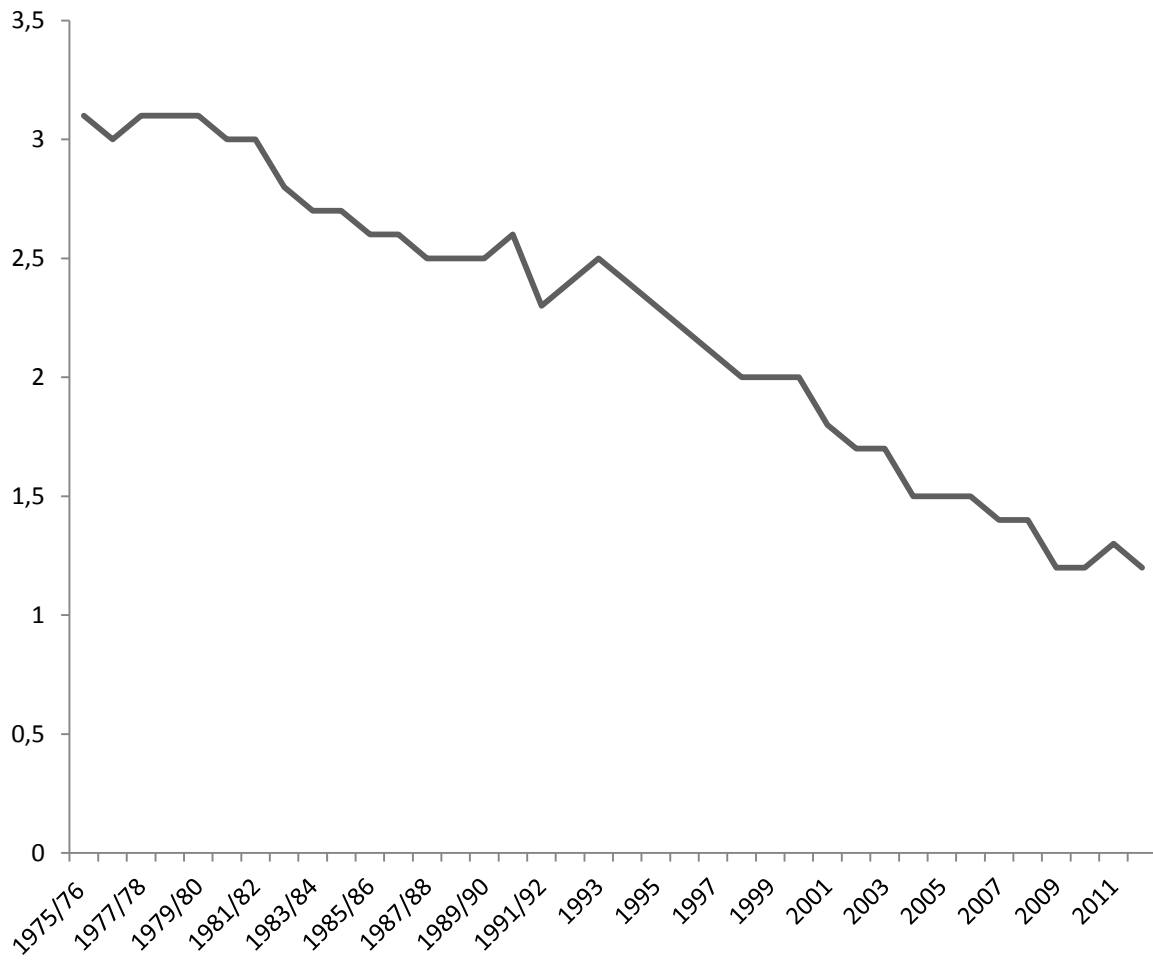
7. Appendix

Table 5. Military spending in share of GDP

Country	USA	Denmark	Finland	Norway	Russia/USSR	Sweden
1988	5,7	2,1	1,6	2,9	15,8	2,6
1989	5,5	2,0	1,5	2,9	14,2	2,5
1990	5,3	2,0	1,6	2,9	12,3	2,6
1991	4,7	2,0	1,8	2,7		2,5
1992	4,8	1,9	1,9	3,0	5,5	2,4
1993	4,5	1,9	1,9	2,7	5,3	2,5
1994	4,1	1,8	1,8	2,7	5,9	2,4
1995	3,8	1,7	1,5	2,4	4,4	2,3
1996	3,5	1,7	1,6	2,2	4,1	2,2
1997	3,3	1,6	1,6	2,1	4,5	2,1
1998	3,1	1,6	1,5	2,2	3,3	2,0
1999	3,0	1,6	1,3	2,1	3,4	2,0
2000	3,0	1,5	1,3	1,7	3,7	2,0
2001	3,0	1,6	1,2	1,7	4,1	1,8
2002	3,4	1,5	1,2	2,1	4,4	1,7
2003	3,7	1,5	1,4	2,0	4,3	1,7
2004	3,9	1,5	1,4	1,9	3,8	1,5
2005	4,0	1,3	1,4	1,6	3,9	1,5
2006	3,9	1,4	1,4	1,5	3,8	1,4
2007	4,0	1,3	1,2	1,5	3,7	1,4
2008	4,3	1,4	1,3	1,4	3,7	1,2
2009	4,8	1,4	1,5	1,7	4,6	1,2
2010	4,8	1,4	1,4	1,6	4,3	1,3
2011	4,7	1,4	1,4	1,5	4,1	1,2
2012	4,4	1,4	1,5	1,4	4,4	1,2

Source: SPIRI,2014

Figure 1. Military spending in Sweden in relation to GDP from 1975 to 2011



Source: Swedish military forces, 2014d

Table. 6 Results of place dummies in OLS with slimmed and extra control variables

VARIBLES	OLS SLIMMED	OLS SLIMMED WITH HUMCAP	OLS SLIMMED WITH EXPENSES	OLS SLIMMED WITH TAXES	OLS WITH ALL CONTROL VARIABLES
ÄNGELHOLM	-0.009586 (0.003074)***	-0.008100 (0.003140)**	-0.004396 (0.003053)	-0.005733 (0.003401)*	-0.000642 (0.003347)
ARVIDSJAUR	0.034629 (0.005368)***	0.038159 (0.005630)***	0.014282 (0.009234)	0.030162 (0.005628)***	0.014067 (0.009150)
BODEN	-0.008541 (0.004174)**	-0.008934 (0.004279)**	-0.019025 (0.007004)***	-0.014684 (0.004359)***	-0.023571 (0.007083)***
BORÅS	-0.004651 (0.003281)	-0.001539 (0.003341)	-0.009172 (0.004076)**	-0.010501 (0.003669)***	-0.012022 (0.004127)***
EKSJÖ	-0.029376 (0.003699)***	-0.027867 (0.003787)***	-0.032743 (0.004485)***	-0.036785 (0.004041)***	-0.037879 (0.004525)***
ENKÖPING	-0.000517 (0.018176)	0.008576 (0.016053)	-0.005868 (0.021997)	-0.010731 (0.016913)	-0.010942 (0.020717)
FALUN	-0.012096 (0.004449)***	-0.013672 (0.004667)***	-0.012811 (0.004925)***	-0.020692 (0.005067)***	-0.021197 (0.005928)***
GÄVLE	0.023155 (0.003628)***	0.023868 (0.003666)***	0.024031 (0.003882)***	0.016114 (0.004250)***	0.018469 (0.004445)***
GOTHENBURG	0.066924 (0.017839)***	0.067500 (0.018863)***	0.043728 (0.019753)**	0.059561 (0.018422)***	0.039664 (0.020801)*
GOTLAND	-0.010347 (0.003895)***	-0.007443 (0.004063)***	-0.009749 (0.004043)**	-0.020584 (0.004871)***	-0.016471 (0.004696)***
HALMSTAD	-0.007210 (0.004265)*	-0.006523 (0.004282)	-0.005611 (0.004543)	-0.006558 (0.004207)	-0.004798 (0.004545)
HANNINGE	-0.038558 (0.007938)***	-0.030370 (0.008273)***	-0.031094 (0.008420)***	-0.042925 (0.007717)***	-0.031003 (0.008341)***
HÄRNÖSAND	0.009486 (0.003079)***	0.008359 (0.003166)***	0.002260 (0.005321)	-0.002501 (0.004640)	-0.007538 (0.006072)

HÄSSLEHOLM	-0.011923	-0.008209	-0.011476	-0.013107	-0.010449
	(0.003132)***	(0.003497)**	(0.003330)***	(0.003128)***	(0.003599)***
KALMAR	0.000180	-0.000940	-0.001696	-0.007014	-0.008134
	(0.003870)	(0.004075)	(0.004328)	(0.004386)	(0.005014)
KARLSBORG	-0.006622	-0.005198	-0.011976	-0.012672	-0.015727
	(0.003566)*	(0.003675)	(0.004526)***	(0.003793)***	(0.004483)***
KARLSKRONA	0.005913	0.005553	0.006091	-0.001627	-0.000280
	(0.003878)	(0.003883)	(0.004231)	(0.004746)	(0.004981)
KIRUNA	0.017089	0.022317	0.002551	0.008479	-0.000830
	(0.008132)**	(0.008320)***	(0.010140)	(0.008109)	(0.009775)
KLIPPAN	-0.007259	-0.000801	-0.006100	-0.007023	-0.002337
	(0.003567)**	(0.004307)	(0.003577)**	(0.003552)**	(0.004728)
KRISTINEHAMN	0.012441	0.004125	-0.006144	0.002897	-0.016520
	(0.023373)	(0.023635)	(0.026227)	(0.023103)	(0.025991)
LIDKÖPING	-0.015235	-0.012120	-0.015566	-0.019724	-0.017478
	(0.004653)***	(0.004795)**	(0.005566)***	(0.004699)***	(0.005408)***
LINKÖPING	-0.012485	-0.016985	-0.010219	-0.013929	-0.013883
	(0.004437)***	(0.005119)***	(0.004714)**	(0.004434)***	(0.006233)**
LULEÅ	0.014434	0.012708	0.010786	0.007725	0.004267
	(0.004788)***	(0.005124)**	(0.005330)**	(0.005045)	(0.006047)
LUND	0.000671	-0.014325	0.004397	-0.002758	-0.007435
	(0.007229)	(0.010284)	(0.007490)	(0.007156)	(0.012867)
MALMOE	0.109496	0.118193	0.068625	0.106411	0.073994
	(0.028712)***	(0.030732)***	(0.031431)**	(0.029772)***	(0.033236)**
NORRTÄLJE	-0.037775	-0.033553	-0.035301	-0.042143	-0.036590
	(0.004097)***	(0.004419)***	(0.004416)***	(0.003985)***	(0.004496)***
ÖREBRO	0.005738	0.004718	0.003810	-0.001105	-0.002354
	(0.004162)	(0.004315)	(0.004733)	(0.004459)	(0.005269)
ÖSTERSUND	0.006862	0.004673	0.004967	-0.001069	-0.002973
	(0.003690)**	(0.004045)	(0.004221)	(0.004339)	(0.005360)

RONNEBY	0.012955 (0.003747)***	0.016168 (0.003915)***	0.010663 (0.003818)	0.005258 (0.004168)	0.006201 (0.004127)
SKÖVDE	-0.011392 (0.004141)***	-0.009522 (0.004156)***	-0.007731 (0.004241)	-0.014694 (0.004063)***	-0.010083 (0.004089)**
SÖDERHAMN	0.034855 (0.003151)***	0.040212 (0.004011)***	0.027206 (0.004897)***	0.028799 (0.003719)***	0.025767 (0.005410)***
SÖDERTÄLJE	-0.014156 (0.006248)**	-0.009414 (0.006194)	-0.013637 (0.006824)**	-0.017054 (0.005960)***	-0.013676 (0.006367)**
SOLLEFTEÅ	0.027612 (0.003603)***	0.029975 (0.003958)***	0.013899 (0.007919)*	0.015402 (0.005025)***	0.006565 (0.007782)
STOCKHOLM	0.203660 (0.070689)***	0.221439 (0.075263)***	0.122213 (0.075747)	0.205217 (0.073038)***	0.140833 (0.080359)*
STRÄNGNÄS	0.012582 (0.007506)*	0.012696 (0.007558)**	0.012702 (0.008100)	0.009896 (0.007106)	0.010944 (0.007822)
UMEÅ	-0.018106 (0.006353)**	-0.024908 (0.007560)***	-0.014421 (0.006482)**	-0.028105 (0.006842)***	-0.027339 (0.009345)**
UPPSALA	0.006727 (0.018015)	0.003127 (0.016253)	0.004173 (0.021853)	-0.003877 (0.016668)	-0.008911 (0.020308)
VÄSTERÅS	0.009614 (0.003808)**	0.008426 (0.003998)**	0.009672 (0.004057)**	0.007410 (0.003811)*	0.007078 (0.004409)
VAXHOLM	-0.065000 (0.007910)***	-0.068091 (0.008158)***	-0.057456 (0.008517)***	-0.067292 (0.007672)***	-0.062139 (0.008983)***
VAXSJÖ	-0.014045 (0.004941)***	-0.015427 (0.005074)***	-0.011290 (0.005070)**	-0.018440 (0.005158)***	-0.015985 (0.005581)***

Table 7. Results of time dummies in OLS with slimmed and extra control variables

VARIABLES	OLS SLIMMED	OLS SLIMMED WITH HUMCAP	OLS SLIMMED WITH EXPENSES	OLS SLIMMED WITH TAXES	OLS WITH ALL CONTROL VAIABLES
1996			0.028394 (0.004601)***	0.028195 (0.004053)***	
1997	-0.005664 (0.002650)***	-0.006070 (0.002574)***	0.018770 (0.004622)***	0.022596 (0.003830)***	-0.009808 (0.000545)***
1998	-0.024721 (0.002377)***	-0.025441 (0.002337)***	0.023316 (0.008423)***	0.003528 (0.003619)	-0.008177 (0.005422)
1999	-0.031017 (0.002483)***	-0.033110 (0.002604)***	0.014087 (0.007437)*	-0.002560 (0.003508)	-0.017715 (0.004519)***
2000	-0.005664 -0.024721	-0.046370 (0.003190)***	0.000986 (0.006930)	-0.009739 (0.003631)***	-0.028083 (0.004160)***
2001	-0.031017 -0.042452	-0.053706 (0.003344)***	-0.007211 (0.006406)	-0.016788 (0.003516)***	-0.036944 (0.003980)***
2002	-0.049025 -0.048829	-0.054256 (0.003543)***	-0.008572 (0.005842)	-0.016658 (0.003425)***	-0.038629 (0.004011)***
2003	-0.045912 (0.002570)***	-0.052040 (0.003796)***	-0.007088 (0.005348)	-0.015579 (0.003272)***	-0.038939 (0.004179)***
2004	-0.040962 (0.002595)***	-0.047816 (0.004035)***	-0.002722 (0.005181)	-0.011681 (0.003231)***	-0.035813 (0.004517)***
2005	-0.037353 (0.002647)***	-0.044896 (0.004290)***	-0.001048 (0.004549)	-0.008407 (0.003120)***	-0.034624 (0.004785)***
2006	-0.042420 (0.002738)***	-0.050539 (0.004529)***	-0.007548 (0.004128)*	-0.013604 (0.003039)***	-0.041411 (0.005048)***
2007	-0.060021 (0.003132)***	-0.068694 (0.004832)***	-0.027253 (0.003733)***	-0.031189 (0.003264)***	-0.061212 (0.005564)***
2008	-0.060318 (0.003143)***	-0.069562 (0.005064)***	-0.028947 (0.003388)***	-0.031262 (0.003173)***	-0.062883 (0.005979)***

2009	-0.033937 (0.003387)***	-0.043798 (0.005323)***	-0.003775 (0.003322)	-0.005567 (0.003368)*	-0.038483 (0.006318)***
2010	-0.022712 (0.003860)***	-0.033068 (0.005882)***	0.005594 (0.003281)*	0.005341 (0.003525)	-0.029484 (0.007219)***
2011	-0.028070 (0.004107)***	-0.039046 (0.006334)***			-0.035366 (0.007661)***

Table 8. Results of time dummies in robustness checks

VARIABLES	OLS, FIXED EFFECTS, NO WEIGHTS	EGLS, FIXED, EFFECTS, WITHWEIGHTS	EGLS CONTROLLED SAMPLE	EGLS HARDER CONTROLLED SMAPLE	EGLS WITH A LOG LOG MODEL
1996	0.035366 (0.007661)***	0.027789 (0.004767)***	0.024607 (0.004633)***	0.038803 (0.006055)***	0.057514 (0.190410)
1997	0.025558 (0.007488)***	0.018410 (0.004634)***	0.015455 (0.004551)***	0.029186 (0.005849)***	-0.069550 (0.178085)
1998	0.027189 (0.010607)**	0.017739 (0.005361)***	0.012406 (0.005563)**	0.020339 (0.006053)***	-0.406151 (0.168418)**
1999	0.017652 (0.009333)*	0.009440 (0.004710)**	0.005454 (0.004848)	0.012788 (0.005292)**	-0.393963 (0.135178)***
2000	0.007283 (0.008147)	-0.000982 (0.004279)	-0.005641 (0.004477)	0.000922 (0.004873)	-0.464456 (0.112483)***
2001	-0.001578 (0.007476)	-0.009177 (0.003818)**	-0.013651 (0.003970)***	-0.007683 (0.004362)*	-0.555627 (0.099982)***
2002	-0.003263 (0.006720)	-0.010045 (0.003388)***	-0.014860 (0.003570)***	-0.009350 (0.003926)**	-0.494831 (0.087031)***
2003	-0.003573 (0.006077)	-0.008923 (0.003101)***	-0.013032 (0.003242)***	-0.008067 (0.003583)**	-0.417260 (0.076447)***
2004	-0.000447 (0.005819)	-0.004477 (0.002834)	-0.007312 (0.002945)**	-0.002960 (0.003288)	-0.265077 (0.065836)***
2005	0.000742 (0.005062)	-0.001671 (0.002495)	-0.003945 (0.002617)	-0.000153 (0.002900)	-0.183800 (0.056450)***
2006	-0.006045 (0.004543)	-0.007689 (0.002152)***	-0.008748 (0.002264)***	-0.005861 (0.002508)**	-0.236093 (0.048137)***
2007	-0.025846 (0.004031)***	-0.026744 (0.001871)***	-0.027920 (0.002073)***	-0.025643 (0.002214)***	-0.606497 (0.042342)***
2008	-0.027517 (0.003548)***	-0.028040 (0.001600)***	-0.029791 (0.001717)***	-0.027789 (0.001894)***	-0.610206 (0.035636)***
2009	-0.003116	-0.005103	-0.008152	-0.005853	-0.141083

	(0.003455)	(0.001405)***	(0.001653)***	(0.001817)***	(0.031896)***
2010	0.005882	0.005187	0.005472	0.006027	0.062734
	(0.003322)*	(0.001300)***	(0.001386)***	(0.001528)***	(0.026558)**

Table 9. BRAC:s in Sweden from 1996 to 2012⁴

Municipality	Name	Time of Shutdown/Moved
Stockholm County		
Haninge	MKO, (MarinB O), [1. Ubflj].	2000, (2004), [2005]
Sodertälje	Ing 1	1997
Vaxholm	Amf 1	2005
Norrtälje	LvSS, Lv3	2000
Stockholm		
Uppsala County		
Uppsala	F16	2003
Enköping		
Södermanland County		
Strängnäs	P10	2005
Linköping	I4, A1, T1	1997
Jonköping County		
Eksjö	I12	2000
Kronoberg County		
Växjö	I11	1997
Kalmar County		
Kalmar	I21	1997
Gotland County		
Gotland	A7, Lv2, KA3, (P18)	2000, (2005)
Blekinge County		
Karlskrona	KA2	2000,
Ronneby		
Scania County		

⁴ For clarity, this table shows the municipalities which was in the sample and it shows the regiments that was moved or completely shutdown (not merged) at which year. For references please see the discussion about closures on p. 19.

Klippan	F5	1997
Ängelholm	F10, FlygS	2002
Malmö	MDÖ	2000
Lund		
Ystad	P7, Lv 4	1997
Hässleholm	P2, A3	2000
Halland County		
Halmstad	I16, Lv6	
Västra Götaland County		
Karlsborg	S2	
Gothenburg	MKV, Amf 4	2000, 2005
Borås	I15	1998
Lidköping		
Skövde	P4	
Värmland County		
Kristinehamn	I22, (A9)	2000, (2005)
Örebro County		
Örebro	I3, (RAB)	2000, (2005)
Västmanland County		
Vasteras	I18	1997
Dalarna County		
Falun	I13	2000
Gävleborg County		
Gävle	I14	1997
Söderhamn	F15	1998
Västernorrland County		
Härnösand	KA5, (MKN)	1998, (2000)
Sollefteå	I21, T3	2000
Jämtland County		

Östersund	I23, (A4), [T3], {F4}	2005, (1997), [2004], {2005}
Västerbotten County		
Umeå	I19	2000
Norrbotten County		
Arvidsjaur	K4	2004
Luleå		
Boden	Lv7, Ing 3, S3	2000
Kiruna	I22	2000