Regional free-riding among municipalities

Can free-riding explain variation in aid to migrant EU/EES streetworkers and what can this tell us about similar cases of municipal welfare provisionment?

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Abstract

The study examines if free-riding behaviour seems to be an explanatory factor when it comes to the variation in municipal aid to EES/EU migrants. The study outlines a descriptive concept of non-excludable municipal welfare based on rational choice theory, and argues that in such situations there will exist incentives for free-riding. The study argues that aid to EES/EU migrants constitute a case of such non-excludable welfare and investigates if there is evidence for free-riding behavior. The study concludes that available statistical data does not support the presence of such a free-riding effect but does not rule it either.

Nyckelord: municipalities, EU/EES migrants, rational choice theory, free-riding, municipalities

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1. Introduction

The purpose of this study

During the 2010s Scandinavia has seen an increase of non-native EU citizen visiting or living in Scandinavia while begging or engaging in other informal street work. Many of these street-workers are Roma from Romania and the increase followed Romania's entry into the EU in 2007 which opened up easier cross-border movement; and following economic crisis in Europe which left many Roma previously employed in informal work in Southern Europe un-employed[1]. As has been described in a extensive interview study by Djuve and others (2015) the street workers often face precarious and vulnerable situation both in Scandinavia and in Romania. Throughout this study I will follow Djuve et. al. in referring to the concerned group interchangeably as migrants; and as migrant street workers to emphasise that migrants often engage in other informal income activity besides begging[2].

This essay is limited to the conditions in Sweden where the migrant group constitute a novel challenge for social service and the welfare-state[3]. Tyrberg and Dahlström (2017) analysed surveys of the municipal aid/support provided to the migrant group and found a large degree of variation between municipalities. Their study found the aid to be negatively correlated with Sverigedemokraterna in pivotal position. In this study I provide further analysis of the data used by Tyrberg and Dahlström to test if free-riding behavior by municipalities can provide further explanation for the variation in aid to migrants. In this study *municipal free-riding* refers to a situation where: municipalities, which can rely on goods in other nearby municipalities to fill the actual or potential demand for such goods in their own jurisdiction, are less likely to provide such goods, compared to if such goods were less available in nearby municipalities.

Based on rational choice theory it is possible to argue that aid to migrant street workers is an area where incentives for free-riding exists. Rational choice theory proposes that free-riding occurs when a good is *nonexcludable* i.e when cannot exclude others from benefitting from a good that we produce or finance. I argue that aid to migrants is a non-excludable good that

[1] In the extensive interview studies performed by Djuve et al many of the street workers had previous experience of migration through southern Europe where many had engaged in informal work often in agriculture or the construction sectors. Interviewees indicated that such opportunities decreased with economic crisis in Europe and due to competition from “african migrants” (see Djuve et. al. 2015: 51f).

[2] Such as musical performance, street sales of certain goods, picking cans, selling magazines. Djuve et. al. that casual (informal) work is sometimes performed and is often sought but is also more common in Oslo and Copenhagen than in Stockholm (ibid.) The term “street workers” also has the benefit of avoiding the derogatory connotation that “beggar” carries with it.

[3] EU/EEA citizens are by law entitled to certain welfare support in their municipalities - if their stay in Sweden can be considered to be temporary as is generally the case for the migrants in this study the support is limited to basic aid (Socialstyrelsen, 2017). The legal rights are somewhat ambiguous, in cases where a person has *right of stay* in Sweden which is required when staying longer than three months the person has the same right to welfare as a Swedish citizen. For a person who is seeking tion employment with a reasonable probability of success there is a right of stay and consequently wide entitlements to welfare-services. In most cases, it seems, migrant streetworkers are considered to not be in such a position that employment is likely, which limits the obligations of the municipality to basic/emergency aid (ibid.).

forms a case of a more general occurrence of *non-excludable welfare*. Which I definee as a situation where *non-residents or non-members of the local municipality can not or are by design not excluded from the welfare of the local municipality*[4]. While welfare systems are often set up to discourage free-riding (se theory section) there are reasons to believe that such situations may become more common (se theory section).

Therefore testing for free-riding in the case of migrant street workers can provide particular insight into the variation in aid to migrant streetworkers which may be of use to those with an interest in this policy area. Secondly testing if such municipal free-riding does or does not occur can give us pointers on what behavior to expect in other cases of non-excludable municipal welfare - and allows some assessment of the relevance of that concept.

Research aims:

- To outline the concept of non-excludable municipal welfare and use it to describe some situations in the swedish welfare-state where rational choice theory would suggest incentives for free-riding.
- To empirically test if free-riding behavior in fact can explain some of the variation in aid to EU/EES streetworkers, which can be considered a case of non-excludable municipal welfare, using data from 2015.
- To conclude what, if any, general implications the empirical results have for the theoretical concept of free-riding in cases of non-excludable municipal welfare.

Previous research

While I am not aware of any studies examining free-riding in Swedish municipalities there does exist international research which establish certain free-rider effects between suburbs and cities in different settings. One example related to the discussion in this paper is Graauw, Gleeson and Bloemraad who identify free riding effects between suburbs and cities in the San Francisco bay area in the case of welfare provided to immigrants.The descriptive category of non-excludable municipal welfare is a novel concept introduced by this study. Previous research into the variation in aid to migrants has been done as mentioned by Tyrberg and Dahlström (2017). Their study show a negative correlation between SD holding a pivotal position in the municipality and the aid to EU/EES migrants. Further in an unpublished undergraduate thesis Linn Granberg has used Tyrberg and Dahlströms data to show that aid to migrant streetworkers data also correlate with the seat shares in socialnämnden of Miljöpartiet. Her study shows that Miljöpartiets influence is different when it is included in different coalitions. Crucially Granberg and Tyrberg introduced different controls, these are of major importance to the results of this paper. It is further likely that structural factors play a

[4] For example in the case to aid to migrant streetworkers there exist no way to distinguish a migrant who commonly spends his/her days in a municipality to one which does not; and no practical feasible way to exclude the migrant if he/she does not. If a municipality for example provides in-door shelter for migrants during cold winter days it is not unfeasible that such a shelter will attract migrants who usually spend time in surrounding municipalities.

part in explaining the variation in municipal aid to EES/EU migrants. Anders Sundell finds in his study patterns among the municipalities which indicates that if a municipal has positive attributes in one area (for example good health) it is likely that it has positive attributes in other areas as well (for example low unemployment rate) (Sundell 2016).

Hypothesis formulation

In this study I initially treat each municipality as a rational agent acting in a region constituting a small to medium sized group of municipalities. Welfare for EU/EES migrant streetworkers is considered a non-excludable and largely non-rivalrous good. In such a case rational choice theory suggest that in cases where municipal aid is accessible for EU/EES streetworkers in a municipality nearby municipalities have an incentive to not themselves provide such welfare and instead free-ride on the aid already provided. This provides the background for the H1 hypothesis below.

H1 There's a statistically significant decrease in welfare support to EU/EES migrant street workers as nearby municipalities offer higher levels of support

As is discussed in section 2.2 the rational choice theory of Olsson (1965) suggest that cities, particularly cities in smaller regions with few connected municipalities, should be the most likely to start providing aid. Related research by Graauw, Gleeson and Bloemraad (2013) find free-rider effects between cities and suburb in the United States for other closely related welfare services. Previous analysis of Tyrbergs data by Granberg further indicate a relationship between aid and the category of the municipality on a nine-level scale from SKL (Sveriges kommuner och landsting 2017) which separates cities suburbs and non-cities. This leads to the following hypotheses

H2 There's a statistically significant decrease in welfare support to EU/EES migrant streetworkers as nearby city municipalities offer higher levels of support.

City-municipalities will here be defined as municipalities with more than 40 000 residents in the central urban locality and where the night-time population do not to a significant degree commute to other municipalities. Large municipalities with considerable commuting are generally suburbs and will not be considered as cities. This will be operationalized using the mentioned nine-level categorization by SKL, see appendix table A1.

It is noteworthy to point out that a distinction should be made between cities being more likely than non-cities to offer higher levels of support and the proposition in H2 that there exists a relationship between support offered in the city and the support in the surroundings. H2 proposes that if we look at cities which offer higher levels of support then nearby non-cities would be likely to be offering a lower level of support. It is easy to imagine cases were there are significant differences in support but no such relationship - for example if we imagine that the entire difference between city and non-city is due to cities having more migrant streetworkers than non-cities. There would be a difference in levels but while we would be able to predict the difference by looking at the difference in migrants we would not be able to predict the difference by looking at the support of other nearby municipalities. H1 and H2 implies a relationship that allows prediction of aid by looking at the surrounding municipalities. This will be investigated by statistical techniques.

2. Theory

2.1 Welfare municipalities in Sweden

As the reader may know in Scandinavia, including Sweden, welfare services and some benefits are to a high degree provided through a decentralized system of partly autonomous local government "kommuner". These entities are in some studies been referred to as welfare-municipalities to emphasise their role as the primary providers of welfare rather than the national welfare-state. The research in this area examine if the delivery of welfare to the population show variation between municipalities (Krögar 1997; Trydegård and Thorslund 2010; Kröger 2011). The 290 "kommuner" in Sweden are governed by locally elected representatives. Local taxes and fees are set by the municipality itself and these provide most of its financing; the state provide further financial support through subsidies and through a redistribution model. The municipalities are obliged by law to provide certain welfare but free to provide further goods and services not obliged by law. It is perhaps not surprising that in such a decentralized system there is variation in the welfare delivered.

For the intents of this study welfare refers to government support directed towards individuals, families or small groups intended to support the fulfilment of human needs and/or a certain standard of living. Welfare can take the form of both services and/or economic benefits. In cases when welfare is to be delivered I argue there is a need to take an administrative decision concerning [1] *who* will deliver or produce this support; and [2] *who* will receive the support, i.e. who is eligible. To a large extent the delivery (question 1) has in Sweden been done through public bureaucracy organized, as pointed out above, in kommuner. From the early 90s delivery of public goods through private intermediaries have increased both in the form of profit- seeking corporations and by non-profit organization (see for example J. Lundquist, 2014 for a discussion of privatization and J. Smedberg 2016 for some discussion of developments in the use of non-profit welfare actors).

2.2 Rational choice theory

The descriptive category of *non-excludable municipal welfare* is a novel concept introduced by this study which is adapted from rational choice theory. In a classic text "the logic of collective action" Olsson (1965) adapts the concept of *public good* from economic theory where public goods are generally defined as goods which are non-excludable and non-rival-rous. The former meaning that if I provide a good and carry the associated costs others can not be excluded from using that good. The latter meaning that consumption by one person do not deplete the good. This creates a *free-rider problem* where the individual who provides the good only receives a fraction of the benefit and must bear the cost of providing for the consumption of others.

The real work is done by the non-excludable attribute, if the good is excludable no free-rider problem arises. If the good is non-rivalrous; a commonly used example would be damming seasonal river to protect from floods; all the down-river inhabitants benefit the free-rider problem lies in assuring that they pay for the building the dam. If the good is instead rivalrous we still suffer from the free-rider problem, but also of issues of depletion and/or congestion. Natural resources such as fishery are commonly used examples of a non-excludable but rivalrous goods. The fisher may be unwilling to bear the private cost due to restricted fishing and this may lead to depletion of fish and a common cost for all fishers. Generally public

welfare and aid can be either rivalrous or non-rivalrous to different degrees, while this has soe theoretical implications, a extended discussion of rivalry is outside the scope of this story.

Free-riding, which is a part of rational choice theory assumes that agents (individuals or collective) seek the maximum expected benefit net costs given some restricted set of outcomes;s i.e agents who choose an optimal course of action given their preferences, opportunities and information (Abell, 2014). This is of course a simplification and much theory consists in providing alternative explanations for how agents of different type and circumstance behave. Nevertheless it is not uncommon, especially in economic theory, to extend the theory and replace the rational individuals with other agents such as firms or organizations (Abell, 2014. Torsvik, 2006).

2.3 Rational choice and municipalities

Municipal welfare systems in Sweden are often set-up to achieve excludability for non-residents for example by obliging municipalities to pay for welfare provided to its residents by other municipalities[5]. There are reasons, however, to expect an increase in the occurrence of non-excludable welfare. With urbanization and continued regional infrastructure improvement the mobility across municipal borders increase[6]. Further groups who lack a clear residence such as homeless EU/EES migrants, but also undocumented immigrants, now make claims on welfare services. Lastly there has been as increased use of publicly financed welfare delivered by NGOs who may be expected to pay less attention to which municipality a welfare-seeker belong.

[5] Such provisions are for example made in the in the general municipal law which specify that the a municipality may not concern itself with matters belonging to another municipality, "får inte ha hand om sådana angelägenheter … som en annan kommun … ska ha hand om", (Kommunallagen 2a kap 2$). More specific instructed exist in the socialservices law which limits the responsibilities of municipalities in which the welfare recipient is not a resident and obliges the resident municipality to pay pay for certain welfare provided by other municipalities (Socialtjänstlagen 2a kap)

[6] Sweden has a high growth in urbanizations while municipal divisions have remain largely unchanged since the 1970s.

2.4 Free-riding as a empirical concept

Graauw, Gleeson and Bloemraad (2013) discuss support for immigrants in California, United States and find evidence of what they term a suburban free-rider effect. The authors argue suburban officials rely on goods paid and provided by cities to meet demand for welfare support by their immigrant residents. It is pointed out that while this might be due to rational calculations by suburb officials and politicians in order to minimize expenses or maximize votes as would be the interpretation favored by rational choice theory. Importantly the authors point out that this need not be the case and that they favor an alternative explanation:

> "[...] in line with our approach underscoring the social construction of target populations, suburban officials simply have a hard time conceiving of their communities as destinations for disadvantaged immigrants, [...] As a result, immigrants, are not recognized as possible targets of grants making nor do suburban officials cultivate immigrant organizations as possible service partners. [...] . [Proximity to the city] makes free riding easier for suburban officials due to the availability of services elsewhere and because of the iconic image that many hold of the traditional gateway city as the natural place immigrants should go for services and where immigrants are presumed to feel more comfortable seeking assistance." (ibid: 86)

I am in agreement with this viewpoint. While I in this study take cues from rational choice theory the free-rider under investigation do not refer to a strict theoretical free-rider effect where the agents perform strategic choices. There may be other causal mechanism described partly or not all all by rational choice that nevertheless result in a empirical fact of free-riding. Municipal free-riding here then simply refers to observations that point towards another most likely geographically close municipality resolving the needs of the another given municipality. Even if this situation is not originally the outcome of some strategic decision by officials to not provide services locally, rational choice theory still provide us with a framework for interpreting possible outcomes.

3. Method

The main focus of the empirical research in this essay is multivariate linear regression. In this study such analysis is carried out by three stages. [1] Identify variables that can capture the relationship described by the hypotheses. [2] Use previous research or available empirics to identify a set of *control variables*. [3] Introduce the control and novel variables in regression model to check if the hypothesized relationships have significant empirical support compared to null-hypotheses while taking into account effects by the controlling variables. [7]. For hypothesis testing a significance level of 5%, is used for all tests. [4] If the null-hypothesis is rejected report standardised coefficients[8] to enable assessment of the relative importance of effects. [5] Proceed to interpret the result if prompted to perform additional analysis. This analysis will be supplemented by graphical analysis.

Involved in this process are are several methodological choices. The choice of data and variables are described in 3.2 and 3.3. Operationalisation of the relationships proposed under the hypotheses are handled under section 3.4. The strategy for model design is discussed under 3.5. Generalisation are handled after the results are presented, see section 5.1.

3.1 Data material

The main data comes from a web-questionnaire sent out to all 290 municipalities representatives in Social Services (socialförvaltningen), between January and April in 2015. The questionnaire contained those municipalities that responded that they did not have any EU/EES streetworkers but these were dropped from the data. There were also some municipalities which did not respond leaving a total of 179 cases in the data-set (Tyrberg, Dahlström 2017, s.10). This survey data is in this study supplemented by various standard statistics such as population size and political mandates in municipal government.

To capture information about the level of support each municipality provided, the questionnaire asked Yes/No questions concerning the municipality provided EU/EES streetworkers with any of seven categories of support. From this Tyrberg compiled a 0-7 scale index which were used to capture the response variable of aid in both Tyrberg and Dahlström (2017) and Granberg 2018. In this study I will use this index as the response variable when testing H1, H3 and H4.

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[7] The null-hypothesis is the proposition that there no correlation exists *in the population* between the phenomena in the hypothesis, and therefore that any correlation is due to random effects when sampling from the full population. We can use statistical techniques to assess the probability that any observed relationship is due to such randomness, if this probability measured by *p-values* is below our significance-level we can with some confidence reject the null hypothesis. Rejecting the null means we have not been able to *reject* our actual hypothesis and so we should be more confident in the validity of our hypothesis.

[8] Effect size refer to the *estimated* strength of the relationship between the explanatory variable (independent variable) and the response variable (dependent variable). In this paper this estimation is done by the common method of fitting linear models where each explanatory variable are provided with a *coefficient* that represent its effect. In order to be able compare the effect size between different explanatory variables we must first *standardize* these coefficients meaning they must be put in terms of the same unit. See the explanation of linear regression in appendix B.

I follow Granberg in using municipal-types scheme created by SKL (see appendix table 1) as an additional control variable, this classification scheme is also used to differentiate cities from non-cities. In order to map regions that are used for analysis in this study I use both the classification into labour market areas (LMAs) created by SCB.

3.2 Operationalization

This section describes the operationalisation for the response and explanatory variable used in each hypothesis. In addition several control variables are used in each model, this are more briefly treated in 3.3.

Response variables - the three main response variables used are:

Municipal welfare for EU/EES migrants, operationalised by a aid index constructed by Tyrberg and Dahlström. The data set is unique there are as far as I am aware no other data on aid to EU/EES migrants. The aid index is based on responses to yes/no questions concerning if the municipality offer any of the following:

[1] Acute shelter.	[4] Food	[7] Financing other actors
[2] Journey to home country	[5] Counseling	
[3] Financial aid	[6] Other forms of aid	

It would be possible to use the answers to the particular relevant questions in the questionnaire rather than the compiled index, this could possibly produce different results and results more easily interpreted as real world effect; however it would make the study a larger undertaking and is outside its scope.

Regional mapping

Before I proceed to the explanatory variables it is necessary to discuss how regions are defined in this study. The hypothesis in this study require that we can distinguish "nearby municipalities", how "nearby" is operationalised can potentially impact the results to a large extent. In this study I use an approach with existing regions based on commuting times. I use the regional division, labour market areas (LMAs, sv. "lokala arbetsmarknadsregioner"), created by SCB but modify the LMA regions around the three largest cities Stockholm, Göteborg and Malmö with more detailed data on commuting destinations from SCB and SKL. The LMA regions are based the levels of commuting between municipalities and on certain central-municipalitie. The regions are meant to reflect the local labour market, an area in which people are willing to take jobs and travel for work (see SCBs "metoder att skapa lokala arbetsmarknader" available online).

Using LMAs often creates what would seem to be sensible regions for this study with a group of municipalities centered around some central city or cluster of larger towns. However in the case of particularly the LMAs around the three largest cities Stockholm-Solna, Göteborg and Malmö-Lund the regions become very large with multiple central cities (A1 or B3) which have their own surrounding suburbs. To alleviate this problem I use the SKL classification index and more detailed LMA data to divide these regions into smaller parts based on commuting levels[9].

[9] Those municipalities that are classified as B3, B4, B5 and therefore have higher levels of commuting to other municipalities than the large cities are grouped into new regions around the most commuted

Explanatory variables

Welfare support offered by nearby municipalities is operationalized mainly by the average of two simple measures NAS (nearby aid summed) and CAS (city aid summed). NAS is calculated by taking the sum of the aid index of all municipalities in the region subtracting the municipalities for which NAS is being calculated and divide this by the number of municipalities in the region. CAS differs from NAS in that it only counts the aid provided by cities. Computationally finding CAS involves programmatic if statements which check if the relevant observation is a city (operationalized as A1, B3 and C6 in the SKL scheme) and it and so forth.

Table X.X Calculation of Average Nearby Aid Summed (Average NAS)

$NAI_n = [(i_1 + i_2 + i_k + \dots + i_n) - i_k] / (k - 1)$				
Municipality and region	Aid index i_n	Region sum $s_{reg} = i_1 + i_2 + i_k + \dots + i_n$	NAS $s_{adj} = s_{reg} - i_k$	avg. NAS $s_{adj} / (k - 1)$
A in region A n = 3	10	10	0	0 = 0 / 3
Y in region A n = 3	0	10	10	5 = 10 / 2
Z in region A n = 3	0	10	10	5 = 10 / 2
B in region B n = 2	10	10	0	0 = 0 / 1
C in region B n = 2	0	10 = 10 + 0	10	10 = 10/1
L in region C n = 1	0	0 + 0	10 = 10 - 0	NA = 10 / 0

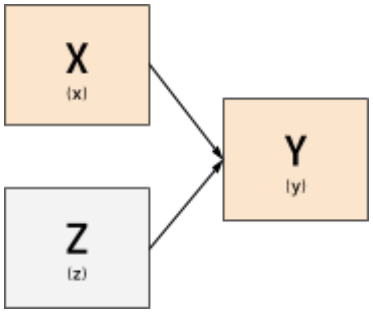
The average NAS should generally be high where the average aid in surrounding municipalities are high and low when the average aid in the surrounding municipalities are low - these are the properties that NAI is meant to capture. However it is also affected by other factors; when there are many municipalities in the one region a high individual value will contribute less, this means larger regions are likely to have a lower NAI. A region with on.

A negative relationship between the average NAS and the aid index would indicate that when surrounding municipalities provide aid the local municipality is less likely to also do so. Such a situation no matter what may be the causal reason will here be considered a free-rider

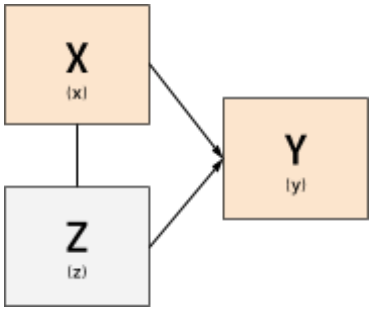
to B3 or B4 municipality. This results in the splitting of Stockholm-Solna into three regions around Stockholm, Uppsala and Södertälje. Göteborg is divided into two around Trollhättan and Göteborg, and Malmö-Lund into two around Malmö-Lund and Helsingborg-Landskrona. The method would suggest splitting Malmö and Lund but these two cities are kept in one region as they are geographically very close and connected.

effect, as it will be a situation of cost advantage for the low aid municipalities. If there is a positive relationship between NAS and the aid index this indicates that belonging to a region of high aid municipalities increases the probability of providing aid. A positive relationship could point to NAS being correlated with some other variable shared by the region.

The reader should note that information about the response variable are *not* a part of the NAI itself as it is subtracted from the sum[10]. The table above provide calculation examples[11]. Regions with single municipalities result in division by zero. This can be handled either by dropping these solitary regions or by assign a uniform value. Both alternatives are discussed to some extent in the results.



Case 1



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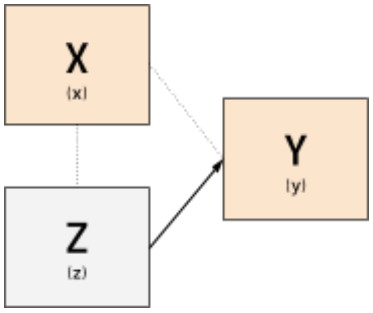
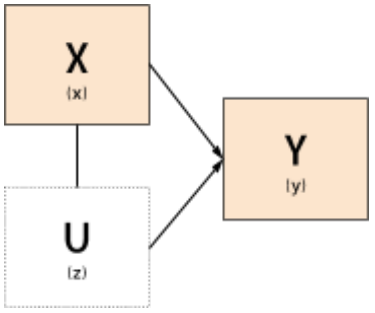


Case 3



Case 4

Case 1. X and Y are related, Y is also related to another known factor Z. We collect data on X, Y and Z and use this to create a model with little x, z and y representing model-representations of X, Y and Z based on our data. If we include both x and z in to a model of y we will receive a measure, generally known as R^2 of how much of the variation in y can be explained by variation in both x and z. Further the model's regression coefficients for x will tell us how much y will change as x changes while holding z constant, and vice versa for z. Modelling both terms allow us to separate the effect x and z have on y. We can use these model results to estimate the relationship between X, Y and Z in reality.

Case 2. Here X and Z are again related to Y, but Z and X are also correlated to each other.

[10] If it were the case we would in a sense be modelling a variable by itself with some mathematical constraints this would naturally result in very high diagnostic-values for example a high R^2 but still be a quite pointless exercise as nothing can be explained by modelling a variable in terms of itself.

[11]

This means that when X is large Z tends to also be large and vice versa. It is now difficult to control Z as there are limited information on how X behaves in isolation from Z. In this case the statistical software determining if an effect should be attributed to X or Z. Another way to phrase this is that it is possible to predict linearly predict *x* (or z).

Case 3
One possibility is that Z causes X and X is an intermediate variable. There may be interaction effects where X can increase or dampen the effect of Z. Another possibility is that that while Z is related to Y , the variable of our hypothesis X is in fact causally unrelated to Y and it simply appears related because of its correlation with Z. There is in actuality no effect between X and Y it is due to Z as is illustrated in case 3. This is a major challenge with relying on correlational statistical research, one possible route to avoid this is to more closely investigate causal mechanisms using other methods.

Case 4
In this case Z is unidentified. We may then observe a relationship A > B which in fact is due to Z > B & Z > A. This causes us to misidentify A as causing B. To avoid this we must identify and include Z in the analysis. This illustrates the importance of using a good set of controlling variables and may suggest that we should control for variables that do not at first seem apparently relevant; if a correlation between the control and the explanatory variable is discovered this can in itself help elucidate results. One way to approach this is to construct many different models using differing controls as having to many model terms in one model decreases its accuracy and usefulness.

3.2 Model design and controls

This study uses a ordinary straightforward approach of multiple linear regression. Except for the explanatory variables and response variables already introduced several controlling variables are used. The study use control variables that are both structural and political. The structural control variables are the following. Gross Regional Product (GRP) 2013, this is a commonly used structural variable that can be of importance for the welfare in the municipality. The estimated numbers of migrants and the estimated years with migrants are also of importance, this is also indicated in the analyses of both Tyrberg & Dahlström (2017) and Granberg (2018). Further are the variables Municipal population growth, Municipal area and residents in municipality important structural factors that are important to consider since it can set different pre-conditions for the municipalities. However since these variables are quite similar to the categorization of municipalities in A1, A2, B3, B4, B5, C8 and C9, the variables are tested in separate models. The percentage share of the municipal population that receives social aid could also be an important factor, if there for some reason is more social aid given in one municipality but not another one it could be because of different pre-conditions. It needs therefore to be considered.

The political control variables are: the seat shares of Sverigedemokraterna (Sweden Democrats), Moderaterna (Right-wing party), Socialdemokraterna (Social Democrats) and Miljöpartiet (Green Party). Tyrberg & Dahlström and Granberg show in their studies that Sverigedemokraterna and Miljöpartiet in different degree in different positions seem to influence the municipal aid to EES/EU migrants. These factors are therefore interesting to include. It is foremost Sverigedemokraterna in pivotal position in socialnämnden that Tyrberg

and Dahlström show negatively correlate with aid, this variable is therefore extra interesting to include. The study also controls if the the ruling party coalition (right, mixed or left wing) effects the result, even though this is not the case in Tyrberg & Dahlström or in Granbergs study, it could be regarding free-riding behaviour and when it correlate with the variables that are relevant to this study. Public opinion of refugees, is also tested in Tyrbergs study, even though it does not show significance in their study it could have an effect in this one. It is important since a negative public opinion of refugees could lead to movement to different municipalities and free-riding behaviour.

4. Empirical investigation

Summary of preceding sections

Before proceeding a brief restatement of the previous discussions main points will be useful. I have clarified that free-riding should here as a relationship where increasing support to migrant streetworkers is associated with a decreased probability to provide support I have pointed out that this should be differentiated from other ...I have further discussed city suburb relations both from the perspective of rational choice theory and other research; both provide support for the proposition..

H1 There's a statistically significant decrease in welfare support to EU/EES migrant street workers as nearby municipalities offer higher levels of support

H2 There's a statistically significant decrease in welfare support to EU/EES migrant streetworkers as nearby city municipalities offer higher levels of support.

Investigation moment 1

Initially the relationship between the aid index and both explanatory variables average nearby aid (average NAS) and average city aid (average CAS) can be explored by a simple bivariate model. Exhibit X.X shows that a negative correlation is found in both cases. There's no statistical difference between the correlations. In the top case average NAS is modelled using the full data set with those regions which only contain one data set remaining coded as zeros; this increases the P value and has an effect on the effect size which is reduced; which of the two choices that best reflect reality is not to me entirely clear.

Model 1A, 1B

Bivariate models

	Aid index ~ Avg. NAS					Aid Index ~ Avg. CAS				
Predictors	*Estimates*	*std. Beta*	*CI*	*standardized CI*	*p*	*Estimates*	*std. Beta*	*CI*	*standardized CI*	*p*
(Intercept)	2.88		2.18 – 3.59		**<0.001**	3.02		2.37 – 3.67		**<0.001**
avg nasb	-0.35	-0.18	-0.63 – -0.07	-0.32 – -0.03	**0.016**					
avg casb						-0.20	-0.25	-0.32 – -0.08	-0.39 – -0.10	**0.001**
Observations	179					179				
R^2 / adjusted R^2	0.032 / 0.027					0.061 / 0.055				

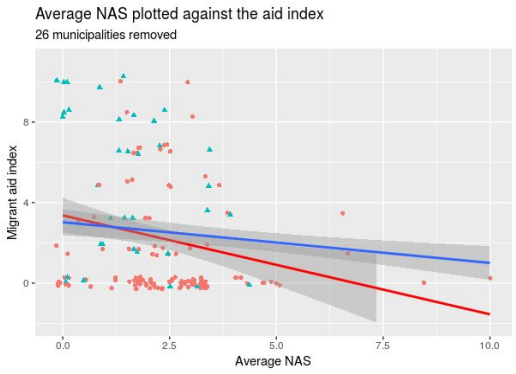
Model 2A, 2B

Bivariate models

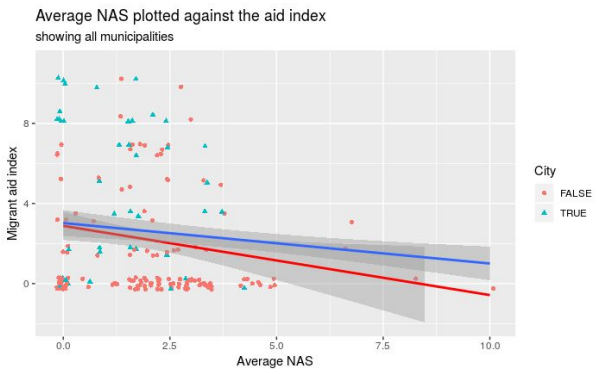
	Aid index ~ Avg. NAS					Aid Index ~ Avg. CAS				
Predictors	*Estimates*	*std. Beta*	*CI*	*standardized CI*	*p*	*Estimates*	*std. Beta*	*CI*	*standardized CI*	*p*
(Intercept)	3.36		2.49 – 4.24		**<0.001**	3.02		2.37 – 3.67		**<0.001**
avg nas	-0.49	-0.24	-0.81 – -0.17	-0.39 – -0.08	**0.003**					
avg casb						-0.20	-0.25	-0.32 – -0.08	-0.39 – -0.10	**0.001**
Observations	153					179				
R^2 / adjusted R^2	0.057 / 0.051					0.061 / 0.055				

Beta refer to regression coefficients.
CI reports a 95% confidence interval surr

Plot 1,



Plot 2,



Red plots the NAS model while blue plots the CAS model. Cities are teal, non cities red. Some jitter which pushes the points a tiny randomly distance from their original points have been introduced to handle overplotting. Left shows the reduced dataset. Dark grey area show 95% confidence intervals.

Plots 1 and 2 above are introduced to give a more intuitive view of the models. Average NAS is, as has been discussed a measure of the average aid offered in surrounding municipalities; points to the far right of the plots have a high level of aid surrounding them while points higher up on the plot offer higher aid themselves. Higher free-riding effects are indicated by more low aid municipalities in the right side of the plot and more low NAS is the left side of the plot - this would indicate stronger correlation between NAS and aid.

In the plots above we can observe a clustering of non cities around zero while cities are more spread across the graph. This points out to us tha cities often are major aid providers while non-cities who generally surround the cities provide less aid.

Investigation moment 2: Average NAS multivariate analysis

	Model 3.1 (Structural)			Model 3.2 (Political)			Model 3 .3 (Structural)		
Predictors	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	0.91	-2.19 – 4.02	0.561	8.57	-3.27 – 20.41	0.155	1.11	-2.48 – 4.69	0.542
Avg NAS	-0.21	-0.50 – 0.09	0.175	-0.45	-0.76 – -0.13	**0.006**	-0.30	-0.60 – 0.01	0.061
A 2(Suburb by A 1)	-1.51	-3.17 – 0.14	0.072						
B 3(Medium city)	2.35	0.45 – 4.25	**0.016**						
B 4(Suburb by B 3)	-1.10	-2.35 – 0.15	0.083						
B 5(Town by B 3)	-1.58	-3.08 – -0.08	**0.039**						
C 6(Small city)	-0.54	-2.24 – 1.15	0.528						
GRP 2013	-0.00	-0.01 – 0.01	0.988				-0.00	-0.01 – 0.00	0.368
Est number of migrants	0.36	-0.21 – 0.93	0.214				0.66	0.03 – 1.29	**0.040**
Est number of years with migrants	1.18	0.46 – 1.91	**0.002**				0.84	0.08 – 1.59	**0.030**
SD seat share				0.04	-0.05 – 0.13	0.381			
SD in pivotal position in socialnämnd?				-2.19	-3.80 – -0.58	**0.008**			
MP seat share				14.48	4.71 – 24.26	**0.004**			
Ruling right coalition				0.01	-1.14 – 1.15	0.989			
M seat share				1.00	-4.45 – 6.44	0.718			
S seat share				2.22	-3.44 – 7.88	0.439			
Refugees				-2.22	-5.83 – 1.39	0.227			
Municipal population growth							0.12	-0.65 – 0.89	0.758
Municipal Area							0.00	-0.00 – 0.00	0.202
Residents in municipality							0.00	-0.00 – 0.00	0.116
%of population receiving social aid							0.08	-0.20 – 0.36	0.579
Observations	143			153			143		
R^2 / adjusted R^2	0.371 / 0.328			0.162 / 0.116			0.311 / 0.270		
AIC	693.331			778.881			704.257		

Seat share refers to the share of seats in a municipalities social welfare board which ...

I introduce multivariate linear regression in order to control for variables. Three models are used. One contains only political factors, the other two structural one using the SKL classification scheme. The lowest R^2 is achieved in model 3.2 using political variables. Model 3.3 indicate that a significant amount of the variation in aid can be explained by the number of migrants and years with migrants. Average NAS is only significant, i.e crossing the standard 0.05 limit for significance, in model 3.2 using political factors. This implies that the null hypothesis - meaning the hypothesis that there the observable relationship is due to random factors should not be rejected. We may however note that the confidence interval for

all the models have an extensive negative bias. The confidence intervals indicates that a positive relationship between NAS and aid is unlikely.

Investigation moment 3: Average CAS multivariate analysis

	Model 4.1 (Structural)			Model 4.2 (Political)			Model 4.3 (Structural)		
Predictors	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	0.15	-2.64 – 2.94	0.914	6.29	-4.62 – 17.19	0.257	0.33	-2.86 – 3.53	0.838
Avg CAS	-0.06	-0.20 – 0.07	0.360	-0.24	-0.36 – -0.12	**<0.001**	-0.14	-0.27 – -0.02	**0.025**
A 2(Suburb by A 1)	-0.96	-2.67 – 0.74	0.266						
B 3(Medium city)	2.58	0.75 – 4.41	**0.006**						
B 4(Suburb by B 3)	-0.73	-1.95 – 0.49	0.238						
B 5(Town by B 3)	-1.18	-2.62 – 0.25	0.106						
C 6(Small city)	-0.20	-1.67 – 1.27	0.788						
GRP 2013	0.00	-0.01 – 0.01	0.903				-0.00	-0.01 – 0.01	0.750
Est number of migrants	0.40	-0.17 – 0.97	0.164				0.61	-0.01 – 1.24	0.055
Est number of years with migrants	1.18	0.49 – 1.86	**0.001**				1.01	0.31 – 1.71	**0.005**
SD seat share				0.01	-0.07 – 0.09	0.741			
SD in pivotal position in socialnämnd?				-2.08	-3.54 – -0.61	**0.006**			
MP seat share				16.05	7.44 – 24.67	**<0.001**			
Ruling right coalition				0.12	-0.93 – 1.16	0.828			
M seat share				1.11	-3.58 – 5.80	0.640			
S seat share				-0.11	-5.13 – 4.90	0.965			
Refugees				-1.26	-4.59 – 2.06	0.454			
Municipal population growth							0.06	-0.56 – 0.68	0.853
Municipal Area							0.00	-0.00 – 0.00	0.742
Residents in municipality							0.00	-0.00 – 0.00	0.141
%of population receiving social aid							0.06	-0.20 – 0.32	0.658
Observations	167			179			167		
R^2 / adjusted R^2	0.329 / 0.291			0.184 / 0.145			0.287 / 0.250		
AIC	810.539			899.596			818.881		

The investigation for average CAS show similar result as the investigation for NAS when introducing controls the apparent relationship is no longer statistically significant.

5. Discussion

Discussion of hypotheses

H1 *There's a statistically significant decrease in welfare support to EU/EES migrant street workers as nearby municipalities offer higher levels of support*

This hypothesis was operationalized by a negative relationship between NAS and the aid index. While regression analysis does establish a negative correlation there is considerable uncertainty in the estimate which is not significant at the 95% level. Confidence intervals show that a positive effect is unlikely. The reason for this is correlation between average NAS and control variables the regression can not using the available data distinguish between the effects of the variables.

H2 *There's a statistically significant decrease in welfare support to EU/EES migrant streetworkers as nearby city municipalities offer higher levels of support.*

This hypothesis was operationalized by a negative relationship between CAS and the aid index. Just as for NAS there is a negative relationship but it is not significant. Confidence intervals here as well point to it being unlikely that there exists a positive relationship.

Analysis indicate a particularly high correlation between NAS and CAS and three other variables with large effects on aid. These are, [1] estimated number of migrant streetworkers in a municipality. [2] estimated years with migrant streetworkers [3] that the municipality is a medium city i.e a B3 classification in SKL's scheme. Of these correlated variables 1 and two 2 are causally relevant; it is reasonable that more years with streetworkers would lead municipalities to adapt and provide aid the same can be said for the number. However being a city is not in itself a explanation to having high aid. It is possible that part of the effect attributed to the city should be attributed to free-riding but the data can provide no support for such a hypotheses. This may be to inadequacy in data and variable selection or the non existence of an actual relationship.

The relationship between NAS and aid or CAS and aid does not have to be uniform there can be a effect for some municipalities counteracted by a positive effect from others. This is a possible venue for further research.

Discussion of non-excludable welfare

Considered as a case study for testing the relevance of non-excludable welfare this study cannot substantiate sisks commonly associated with non-excludability such as depletion, congestion or undue financial/administrative burden placed. That moderat free-rider effects exist cannot be excluded but if a large effect did effect would be more likely to show up in statistical texts. If non-excludable welfare is not a concept of empirical significance it's relevance is naturally lessened. That being said it does provide for a interesting perspective on welfare and testable hypotheses. Further research can be conducted to assess its empirical relevance, but if empirically relevant predictions is not a result of the category it should be discarded.

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6. Conclusion

- This study cannot establish statistical correlation that provide evidence for free-riding behavior among municipalities in general or between cities and their surrounding non-city municipalities. While bivariate correlation between the operationalised measure such correlation becomes uncertain when introducing controlling variables.

- The possibility of such free-riding effects as outlined in this study can not however be rejected. Point estimates of standardized beta coefficients with confidence intervals indicate that medium sized effects are possible. These effects would if present likely be smaller than other statistically significant factors which other studies have previously indicated, such as Sverigedemokraterna in a pivotal position or the shares of Miljöpartiet in the relevant municipal boards.

- This study can with confidence reject a positive relationship between the aid to migrant streetworkers in a given municipality and the aid which is given in municipalities near to to that municipality. Given the available data a positive relationship due to for example regional coordination and cooperation or diffusion of practice between neighbours is unlikely.

- This study has introduced a descriptive category of non-excludable welfare and argued that aid to migrant streetworkers should be considered part of this category. Free-riding this study has argued can if it is present bring considerable problems such as a under-supply of goods and uneven cost-burdens.

- Read as a case study on the possible effects of organisational structures that allow for non-excludable welfare this study cannot substantiate such risks. The possibility of free-riding in cases of non-excludable welfare can in no way be excluded but neither can such risks be confirmed.

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8. Appendix

(A) Standardized beta coefficients

	Model A1.1 (Structural)					Model A1.2 (Political)					Model A1.3 (Structural)				
Predictors	*Estimates*	*std. Beta*	*CI*	*standardized CI*	*p*	*Estimates*	*std. Beta*	*CI*	*standardized CI*	*p*	*Estimates*	*std. Beta*	*CI*	*standardized CI*	*p*
(Intercept)	0.91		-2.19 – 4.02		0.561	8.57		-3.27 – 20.41		0.155	1.11		-2.48 – 4.69		0.542
Avg NAS	-0.21	-0.10	-0.50 – 0.09	-0.24 – 0.04	0.175	-0.45	-0.22	-0.76 – -0.13	-0.37 – -0.06	**0.006**	-0.30	-0.14	-0.60 – 0.01	-0.29 – 0.01	0.061
A 2(Suburb by A 1)	-1.51	-0.18	-3.17 – 0.14	-0.37 – 0.01	0.072										
B 3(Medium city)	2.35	0.23	0.45 – 4.25	0.05 – 0.42	**0.016**										
B 4(Suburb by B 3)	-1.10	-0.15	-2.35 – 0.15	-0.31 – 0.02	0.083										
B 5(Town by B 3)	-1.58	-0.16	-3.08 – -0.08	-0.32 – -0.01	**0.039**										
C 6(Small city)	-0.54	-0.05	-2.24 – 1.15	-0.21 – 0.11	0.528										
GRP 2013	-0.00	-0.00	-0.01 – 0.01	-0.18 – 0.18	0.988						-0.00	-0.08	-0.01 – 0.00	-0.25 – 0.09	0.368
Est number of migrants	0.36	0.12	-0.21 – 0.93	-0.07 – 0.31	0.214						0.66	0.22	0.03 – 1.29	0.01 – 0.43	**0.040**
Est number of years with migrants	1.18	0.26	0.46 – 1.91	0.10 – 0.42	**0.002**						0.84	0.19	0.08 – 1.59	0.02 – 0.35	**0.030**
SD seat share						0.04	0.09	-0.05 – 0.13	-0.11 – 0.29	0.381					
SD in pivotal position in socialnämnd?						-2.19	-0.23	-3.80 – -0.58	-0.40 – -0.06	**0.008**					
MP seat share						14.48	0.25	4.71 – 24.26	0.08 – 0.42	**0.004**					
Ruling right coalition						0.01	0.00	-1.14 – 1.15	-0.17 – 0.18	0.989					
M seat share						1.00	0.03	-4.45 – 6.44	-0.14 – 0.21	0.718					
S seat share						2.22	0.07	-3.44 – 7.88	-0.11 – 0.26	0.439					
Refugees						-2.22	-0.11	-5.83 – 1.39	-0.29 – 0.07	0.227					
Municipal population growth											0.12	0.03	-0.65 – 0.89	-0.15 – 0.20	0.758
Municipal Area											0.00	0.10	-0.00 – 0.00	-0.05 – 0.25	0.202
Residents in municipality											0.00	0.17	-0.00 – 0.00	-0.04 – 0.38	0.116
%of population receiving social aid											0.08	0.04	-0.20 – 0.36	-0.11 – 0.20	0.579
Observations	143					153					143				
R^2 / adjusted R^2	0.371 / 0.328					0.162 / 0.116					0.311 / 0.270				
AIC	693.331					778.881					704.257				

Tables for reference

Table 1

Type	Explanation
A1 City	Large city: at least 200 000 municipal residents with at least 200 000 in the largest urban locality.
A2 Suburb	Suburb by large city: at least 40% of the night-time residents commute to a A1 municipality or a municipality near a A1 municipality.
B3 City	Medium city: at least 50 000 municipal residents of which at least 40 000 in the largest urban locality.
B4 Suburb	Suburb by medium city: at least 40% of the night-time residents commute to a B4 municipality.
B5 Town	Town by medium city: located near a B3 municipality where below 40% of the night-time residents commute
C6 Town	Town freestanding: municipality with at least 15 000 residents but less than 40 000 in the largest urban locality.
C7 Suburb	Municipalities were at least 30% of the night-time residents commute to work in another town and/or at least 30% of the working population live in an another municipality
C8 Rural	Municipalities with less than 15000 inhabitants, low commuting pattern less than 30%
C9 Rural	Rural municipality with extensive tourism as defined by number of hotel nights and revenue in hotel, restaurant and shops business in proportion to the number of residents.