DEPARTMENT OF ECONOMICS

BACHELOR'S THESIS

Ethnic Diversity, a Desolation Row for Interpersonal Trust?

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January 15, 2016

Abstract

In this paper we will investigate whether the ethnic composition of a county affects their trust. More specifically we will answer the question: does the ethnic composition affect the level of trust in Sweden and are there any specific factors that increase this effect? In order to do this we use data on Swedish citizens from the year 2001 to the year 2012. As an approximation for ethnicity we use the individuals country of birth and to estimate trust we use two different measures: general trust and local trust. We also collected numerous of context variables to control for unwanted effects. Using a multiple regression analysis we isolate the impact of ethnic heterogeneity on trust. In addition to this we tested for several interaction effects to see if some factors are especially harmful on trust when combined with ethnic heterogeneity. Starting with a paper by Putnam (2007) there has been a debate in Europe regarding whether ethnic heterogeneity affect the level of trust and much research on the subject has been published. However, our paper contributes to this research in two ways: It looks at the relation between the change as well as the level of ethnic heterogeneity on trust and with the basis in the theories from Lipset and Rokkan (1967) we check for interaction effect that might increase the negative effect on trust. Our study shows that ethnic diversification has a significant negative effect on local trust while no significant conclusions can be made when it comes to general trust. No significant interaction effects are found.

Keywords: *Local trust, general trust, ethnic diversity*

Contents

1 Introduction

Trust affects a societies economic welfare and development — in places where people trust one another the society, its institutions and the market are functioning better. Several empirical studies have been done on the subject, among them, Knack and Keefer (1997) show that trust has a positive impact on growth, Guiso et al. (2004) find a positive connection between trust and financial development, Fukuyama (1995) argue that trust is essential for a well functioning market economy and LaPorta et al. (1997) show that high levels of trust is associated with more cooperation and less corruption in society.

Due to the positive aspects that follow in a society with high levels of trust researchers have tried to pinpoint which factors that causes people to trust each other and the institutions of society. One of the variables that seem to have an impact on trust is the degree of ethnic heterogeneity in a society. From a European perspective this correlation is of particular interest. Over the last decades the immigration of refugees and workers to Europe has increased and the European population is becoming more and more diversified in terms of ethnic background. On account of the conflict in Syria, the outbreaks of violence in its surroundings and the stream of refugees it has given rise to; this question is of more interest than ever. However, the research in this field is somewhat ambiguous and the studies carried out have reached different conclusions depending on where they were executed, and how they choose to define and measure trust (Gijsberts et al. 2012). In this paper we will further analyse the correlation between trust and ethnic diversification using data from all Swedish counties. More specifically we will answer the question: does the ethnic composition affect the level of trust in Sweden and are there any specific factors that increase this effect?

The study is conducted with quantitative methods. Using data over different trust measures, ethnic diversification and various control variables we run regressions in order to see if there exist any significant correlation between the level of trust and the ethnic diversification in Swedish counties. To be able to make a deeper analysis we use variables on both a county and an individual level. In line with the theories of Lipset and Rokkan we also check for various interaction effects to see if certain factors, when combined with ethnic diversification, increase the impact on the level of trust.

Our study shows that ethnic diversification has a significant negative impact on local trust, while it does not have any significant impact on general trust. Furthermore, the change in ethnic diversification has a much stronger affect on local trust than the level of ethnic diversification. No significant interaction effects are found.

The remainder of this paper is organized as follow. Section 2 presents previous research. Section 3 outlines the theoretical framework for our study. In Section 4 the data and the method used is presented. In section 5 we present the results and section 6 consists of our conclusions.

2 Previous Research

The relation between ethnic diversity and trust has been a topic of debate during the last decade. Research has contributed with numerous of studies investigating the relation between ethnic heterogeneity and trust between people. The first studies undertaken on the subject are from The United States [see for example: Putnam (2007), Alesina and La Ferrara (2002)] and demonstrate a negative correlation between trust and ethnic diversity. The results published by Putnam (2007) are especially dismal showing that ethnical heterogeneity not only decreases trust between different ethnic groups but also within the groups, causing people to hunker down and withdraw from society. An Australian study also gives support for this thesis arguing that both general and local trust are lower in ethnic diverse neighbourhoods (Leigh 2006). Although most American studies show evidence of a negative relation, the overall research in this field is somewhat ambiguous and the studies carried out have reached different conclusions depending on where they were executed, and how they choose to define and measure trust (Gijsberts et al. 2012). The result from Europe is not as clear-cut, most of the research finds a negative correlation between trust and ethnic heterogeneity but there are studies that do not find support for this conclusion. Letki (2008) finds no or little support for the negative diversity-trust relation in her study carried out in the UK. She does, however, find a raw negative correlation between ethnic diversity and trust but she claims that it is explained by poverty. A recent Dutch study examined the relation in Dutch neighbourhoods finding no evidence for the negative diversity-trust relation (Gijsberts et al. 2012). Most cross-national studies tend to reject the negative impact from diversity on trust (Gijsberts et al. 2012), however these studies look at general trust, a more robust measurement than local trust (Trägårdh et al. 2013)

In Sweden, the focus area for this paper, there exist two previous studies on the connection between ethnic heterogeneity and trust. Gustavsson and Jordahl (2008) use data over the Swedish counties and find a negative correlation between trust and the proportion of people born in a foreign country, however they do not find any statistical significant effect on trust and ethnic fragmentation. In *Den svala svenska tilliten* the authors look at three measures of trust in 33 Swedish municipalities during the year of 2008 (Trägårdh et al. 2013). They find a negative connection between local trust and ethnic diversity but no statistical significant effect of ethnic diversity on general trust.

Overall, the research cannot find a mutual consensus and the diversity-trust relation is confirmed as often as it is rejected. Although the method is comparable between different researches, different studies tend to use different measurements of trust and ethnicity. While some only look at general trust, others look at local trust or other measurements. Regarding ethnicity, most studies use a diversity index while others, not too many, look at the percentage of foreign born people. Furthermore, Letki (2008) claims that early research often omits important socio-economic factors.

Since the result seems to differ depending on where they are executed, it is of great interest to further analyse the relation of diversity and trust in a Swedish setting. This

paper differs from the two earlier Swedish ones in several ways. As Gustavsson and Jordahl (2008) we look at the Swedish counties but we use data from a much longer time period. Since our data is from a later time period as well we have a greater variation in it when it comes to ethnic diversity. We use two of the same measures of trust as Trägårdh et al. (2013), general trust and local trust. However in contrast to their study we have access to time series data over the whole of Sweden, which enable us to look at both the change and the level of ethnic diversity. Overall our study contributes to the research in two ways: It looks at the relation between the change as well as the level of ethnic heterogeneity on trust and with the basis in the theories from Lipset and Rokkan (1967) we check for interaction effect that might increase the negative effect on trust.

3 Theory

As we have seen, the findings from earlier research are contradictory were some, mostly American studies, find a clear negative relation between ethnic diversity and trust. Others, especially European studies, are far more ambiguous. The topic of trust and ethnic diversity has, however, been on the agenda for quite some time and in the literature there are broadly speaking two opposing theories called the contact theory and the conflict theory. In this section we will go through these theories among with different trust measurements and a theoretical basis for why interaction effects is of interest for this study.

3.1 Trust

When studying trust it is of great importance not only to understand what causes people to trust each other but also how we define the word. Trust is a somewhat ambiguous concept that can be measured in several ways. In this study we will focus on two different measurements of trust: local trust and general trust. These are commonly used in the literature and capture two different aspects of the term. General trust is a broad concept that measures if you trust people in general, regardless if you have met them or not. Local trust on the other hand is a more spatially delimited measure that captures whether you can trust neighbours and people in your immediate surrounding (Trägårdh et al. 2013, pp. 19; 224). Another important difference between the two measurements is that while general trust is deeply rooted and mainly moulded during ones upbringing local trust is much more volatile and sensitive to changes in individuals surroundings (Trägårdh et al. 2013, p. 166). We should therefor expect that ethnic diversification has a greater impact on local trust than on general trust.

3.2 Ethnic Diversity and Trust

Allport (1979) claims in his theory, the contact theory, that inter group contacts under certain conditions reduce prejudice and stereotypes towards the outgroup. This theory suggests that the diversity-trust relation can be positive if opposing ethnic groups would

interact together. Interaction is assumed to increase understanding and solidarity between people, which will lead to less prejudice and higher trust. Another theory, the homogeneity theory, suggests that the interaction between groups necessary in the contact theory is hard to achieve since people tend to interact with people sharing the same characteristics as themselves, like ethnic background or religious believes (McPherson et al. 2001). In neighbourhoods of high diversity people are therefore expected to have less frequent contact.

A direct opposing theory to the contact theory is the conflict theory (Quillian 1995) suggesting that hostility between groups increase with more people belonging to the outgroup. With more members of the outgroup people will experience ethnic competition and withdraw into their own ethnic group. Solidarity and trust towards members of the same ethnic background will increase while it will decrease towards the outgroup. This theory is in line with Putnam (2007) claiming that people living in ethnic diverse neighbourhoods tend to hunker down and draw back from society. Putnam argues, however, that trust will not only decrease towards the outgroup but also towards members of the same group. In other words, Putnam's constrict theory suggests that diversity deprives trust towards all people regardless of their ethnic background.

3.3   Interaction Effects

In this study we also investigate whether there are specific factors that, when combined with ethnic diversification, are especially harmful for the level of trust. Lipset and Rokkan (1967, pp. 1-56) points out that it is of importance in what way cleavage structures in society emerge. Cleavage structures can bring different groups together or reinforce already existing differences between the groups depending on how it emerges. Taking ethnicity as an example: a conflict that affect all ethnic groups in society will lessen the conflicts between the groups and instead unite them towards the injustice that they all face — the old conflict between the groups becomes less important and it becomes easier to reach an understanding. On the other hand, if a conflict coincides with the ethnic minorities it can reinforce the differences between the groups and the difficulties to reach an understanding increase. In our setting this means that we could expect to find interaction effects between factors that coincide with ethnic minorities and the affect ethnic diversity has on trust. It is of great interest to find and map these factors since they will be especially harmful for the level of trust in society.

4   Method and Material

This section describes the data and how it is applied to fit the purpose of the study. Firstly, the data as a whole and the variables of which it consists are explained. Secondly, the empirical methods used to build the statistical models of the study are described. Last is a discussion about the limitations of the models and the implications that follows from these limitations.

4.1   The Data

The data used in the study are primarily from two sources: Statistics Sweden and the SOM-Institute. Statistic Sweden is the government agency responsible for producing official statistics in Sweden and the SOM-Institute is an impartial survey institute at the University of Gothenburg.

Statistics Sweden has extensive and continuous data over a broad range of variables, which makes it an ideal source for collection of panel data. To collect data over ethnicity we use the report *Tables on the population in Sweden*, which is published every year.[1] It is based on information, obtained by the Swedish Tax Agency, from the national registration and thereby provides a good description of the Swedish population and its composition. Since the data from these reports are, among other things, sorted after individuals country of origin we can identify how diversified counties are with regard to this aspect — our approximation of ethnic diversity. Unfortunately this data set does not allow us to identify specific individuals and thereby connect them to and control for other characteristics on an individual level. Another problem is that Statistics Sweden does not publish detailed information on from which countries foreign born originate. Instead they report from which continents foreign born originate plus a more detailed list over a few selected countries, that is, the countries from which most people born abroad originate during a specific year. This imply that the countries stated in the report can differ from year to year, however all continents are present for every year. We collected data from all reports between 2001 and 2012.

In addition to the reports *Tables on the population in Sweden* Statistic Sweden was used to collect data for control variables on an aggregated level. In the Statistical Database Statistic Sweden has gathered official data from several public authorities over a range of variables. The data for the control variables was collected on a county level and for the same time period as we have data on ethnicity (2001-2012). The only exception is the variable crime, a measure of the amount of crime reports in a county for a given year, which is taken from The Swedish National Council for Crime Prevention (Crime Prevention 2001-2013).

Since no good data over trust is accessible from Statistics Sweden we turned to the SOM-Institute. The SOM-Institute has conducted a nation-wide survey on a random sample of approximately 3400 individuals every year since 1986 in order to map peoples opinions and behaviour (SOM-Institute 2015). Besides containing data over several different measurements of trust this survey has two advantages that makes it suitable for this study. First, parts of the study are kept unchanged over the years providing continuous time-series. Second, the study allows us, through individual identification numbers, to identify and connect answers from the same individual, which makes it possible to control for characteristics at an individual level. The disadvantage with the SOM survey is that while it contains data over general trust for all the years that we have data over ethnicity (2001-2012) it only has adequate data on local trust for the

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[1]More specificially we have relied on the followng publications by Statistics Sweden (2001; 2002; 2003; 2004; 2005; 2006; 2007; 2008; 2009; 2010; 2011; 2012).

years 2009-2011.

4.2   The Variables

This study uses two different measures of trust as our dependent variable. The independent variable of main interest is ethnic diversity that is calculated using a Herfindahl-Hirschman Index (HH-Index) and takes a value between 0 and 1. In addition, several control variables are used. This section goes through these variables, explain how they are calculated and what purpose they have for the study.

4.2.1   Dependent Variable

We use two different measures of trust: local trust and general trust. The decision to use these specific measurements is based on previous literature and theories (see Section 3). The data on general trust was collected by the SOM-Institute using the question "In your opinion, to what extent can people in general be trusted?".[2] The respondents are then asked to give their answer on a scale from 0-10, where 0 is "In general, people cannot be trusted" and 10 is "In general, people can be trusted". Local trust is measured in the same way, however the question is changed to "In your opinion, to what extent can people in your immediate surroundings be trusted?". In line with earlier studies in Sweden and elsewhere we take the average of all respondents answers in a given county as a measurement on the trust level for that county [see for example (Gustavsson and Jordahl 2008)]

4.2.2   Independent Variables of Main Interest

To measure ethnic diversification we use data over peoples country of origin. Since ethnicity is a diffuse and somewhat subjective concept it is necessary to use a proxy variable. Country of origin is not an ideal proxy since it leaves out several factors such as second-generation immigrants and does not take into consideration that people originating from the same country can have different ethnic backgrounds. Because of limited data this proxy becomes more problematic, Statistics Sweden does not publish a list of all countries from which people immigrate, and since the list of selected countries varies from year to year the most accurate classification of ethnicities available is not as precise as it would have been on a country level. Despite these shortcomings we chose to use country of origin as a proxy for ethnicity. The reason for this is twofold: in absence of better data this is the best classification at hand and this is the proxy most commonly used in earlier studies. Our grouping of ethnicities are as follow: Africa, Asia, Eastern Europe, North America, Northern Europe, Oceania, South America and Western Europe.

The next step is to turn these groups into a numerical index over ethnic diversification. To do this we use the HH-Index, which originally is developed to measure the degree of

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[2]All quotes in this paragraph are our translations.

competition on a market (Lundmark 2010, p. 506). However, its characteristics makes it well suited as a measure over the degree of ethnic diversification. The HH-Index for a county is calculated by first dividing the number of people belonging to a certain ethnicity group with the total number of people in that county. Next you take the square root of the quotient from all different ethnic groups and subtract these from one:

$$\text{Diversity Index} = 1 - \sum_n s_{n,c}^2 \tag{1}$$

Where $s_{n,c}$ stands for the share of ethnic group n in county c. The Index created takes a value between 0 and 1 where 0 imply a completely ethnic homogenous county and the closer the number comes to 1 the more diversified the county is.

The second independent variable of main interest is the change in the diversity index. Since we have data over several years we are able to calculate the change in the index between these years. The reason for why the change rather than the level of ethnic diversification might be of interest for this study is to examine whether peoples level of trust is affected by the degree of ethnic heterogeneity or by the change in the ethnic composition, but also to compare the two effects and see if the impact from them differs.

4.2.3 Control Variables

In order to isolate the effect of ethnic diversity we have to control for other variables that might have an impact on trust. The problem with this is to pinpoint which these variables might be and find data over them. Fortunately there are many existing studies on the relationship between ethnic diversity and trust. We have simply observed what control variables that are used in the existing literature and used the same in our study. There are however two aspects that need to be mentioned here. First, in choosing control variables a selective process is necessary since there exist too many in previous literatures. In selecting the ones for this study we have picked the control variables most commonly used in the literature and focused on the ones used in previous Swedish studies. Second, we have control variables both on an aggregated and an individual level. The decision on whether a control variable should be on aggregated or individual level is based on theoretical considerations. Some variables such as sex makes more sense to control for on an individual level since it is reasonable to believe that an individuals sex affect their trust while it doesn't make sense to control for it on an aggregated level since the division between the sexes in different counties is more or less constant and fifty-fifty. Other variable such as population density is controlled for on an aggregate level, which is self-evident. The variables used in the study are listed in appendix B

4.3 Empirical Methods

In building our statistical models we started out by only using county level variables, then we extended the model by including variables on an individual level. The different models face different challenges and thereby demand different approaches. These models

are described and discussed below.

4.3.1 County Level

On the aggregated level we have few observations since Sweden consists of only 21 counties. To increase the power of our regression we used the fact that we have data for several consecutive years — by pooling our data we are able to increase the numbers of observation. Pooling data means that you treat your panel data as cross-section data by ignoring the time differences between the observations. Even though we ignore the time differences when creating our models we still have to consider the time aspect since it might cause autocorrelation. We therefore tested for this using the Durbin-Watson test. However, no significant autocorrelation was present in our models (see appendix A)

Using the pooled data we run ordinary least square (OLS) and fixed effects (FE) estimations on both local and general trust. The OLS estimation treats the pooled data as a regular regression assuming no unobserved time or county differences. On the contrary, in the FE model we include time dummies allowing for the different years to have different intercept. The advantage with the FE model is that the time dummies absorb any unobserved differences over time and correct for this. However, if no unobserved time differences exist the OLS model is to prefer since the FE model loses in power due to extra control variables, i.e. the time dummies (Gujarati and Porter 2009, pp. 594-599). In the general trust model eleven time dummies had to be added since we used data over twelve years, in the same way the local trust model included two time dummies since we used data over three years. To see which model that best fitted our data we tested whether the time dummies was jointly significant in each model. It should be added that the FE model also could include dummies for each county instead for, or together with, the time dummies in order to adjust for unobserved differences between the counties. Considering that the data consist of more counties than time periods this would imply including 20 dummies as comparison to eleven (general trust) or two (local trust). Doing this would therefor decrease the power of the model substantially. In addition we do not find it reasonable to believe that different intercepts for each county would improve our model. In both the OLS and FE model we use robust standard errors to correct for any possible heteroscedasticity. The models used are displayed below:

$$\text{Pooled OLS}: Y_{i,t} = \beta_0 + \beta_1 di_{i,t} + \beta_2 rent_{i,t} + \beta_3 edu_{i,t} + \beta_4 emp_{i,t} + \beta_5 den_{i,t} \\ + \beta_6 heal_{i,t} + \beta_7 cri_{i,t} + \beta_8 age_{i,t} + \beta_9 inc_{i,t} + \varepsilon_{i,t}$$
(2)

$$\text{Fixed Effects}: Y_{i,t} = \beta_0 + \beta_1 di_{i,t} + \beta_2 rent_{i,t} + \beta_3 edu_{i,t} + \beta_4 emp_{i,t} + \beta_5 den_{i,t} \\ + \beta_6 heal_{i,t} + \beta_7 cri_{i,t} + \beta_8 age_{i,t} + \beta_9 inc_{i,t} + \delta 2002_i \\ + \delta 2003_i + \delta 2004_i + \delta 2005_i + \delta 2006_i + \delta 2007_i + \delta 2008_i \\ + \delta 2009_i + \delta 2010_i + \delta 2011_i + \delta 2012_i + \varepsilon_{i,t}$$
(3)

Where $Y_{i,t}$ stands for eighter local or general trust in county i at the time period t. The year dummies in equation 3 will vary depending on whether Y stands for local or general trust — while general trust include all the dummies above, local trust only include the dummies for year 2010 and 2011. Furthermore, different versions of these regression models are used and all the control variables will not be included in all models. For an explanation over the variables see appendix B.

4.3.2 Multilevel

When using variables on both an individual level and a county level the number of observations increase remarkably since our observations now consist of respondents in the SOM survey — instead of having 21 counties we now have approximately 4500 respondents as our observations. The dependent variable now becomes the respondents personal trust level, as stated in the survey; individual characteristics are also controlled for using the individuals answers in the questioner. However, a problem arises when adding county characteristic control variables such as the diversity index. In doing so all individuals from the same county receives the same value on the county level variable, that is, all individual living in the same county are now sorted into a cluster. The problem with this is that our sample consist of independent individuals but in adding the county level variables the errors for individuals within the same cluster becomes correlated (Cameron and Trivedi 2009, p. 82). So if our model overpredict x for one individual in one county it is likely to overpredict x for all individuals in that county – we get a positive correlation. When individuals are sorted into clusters both regular and robust standard errors are incorrect and tend to be substantially downward biased (Cameron and Trivedi 2009, p. 327). To correct for this we use clustered standard errors on all regressions in the multilevel setting.

Using cross-section data from 2011, the year with the most observations of both general and local trust, we estimated four OLS regressions for each dependent variable. The model is displayed below:

$$
\begin{aligned}
\text{OLS}: Y_i = & \beta_0 + \beta_1 di_i + \beta_2 rent_i + \beta_3 edu_i + \beta_4 emp_i + \beta_5 den_i + \beta_6 heal_i \\
& + \beta_7 cri_i + \beta_8 age_i + \beta_9 inc_i + \beta_{10} ba10_i + \beta_{11} bc20_i + \beta_{12} mf30_i \\
& + \beta_{13} working_i + \beta_{14} subclg_i + \beta_{15} subclh_i + \beta_{16} edu3_i + \beta_{17} hinc3rel_i \\
& + \beta_{18} hhtypela_i + \beta_{19} child_i + \beta_{20} sex_i + \beta_{21} agereg_i + \varepsilon_i
\end{aligned}
\tag{4}
$$

Where Y_i stands for either local or general trust for individual i. Furthermore, different versions of this regression model is used and all the control variables will not be included in all models. For an explanation over the variables see appendix B.

4.4 Limitations

In this study there are some limitations to the models and the data on which they are built. Overall it would be desirable to look at a municipality level rather than on a county level in order to make the model more precise. Because of limited data over trust this was however not possible. The sample for the SOM-Institute are randomly drawn across the whole country which have resulted in that for some municipalities we only have a handful observations – too few to perform statistical tests. With data available on a municipality level the problem regarding few observations, because of the limited amount of counties in Sweden, would be solved since the number of observations would increase from 21 (the number of counties) to 290 (the number of municipalities).

Using survey data such as the one we use from the SOM-Institute always imply limitations. As with all surveys there is a risk that the people not responding to the survey are not random but rather belongs to a specific group. It is for example plausible to imagine that low trusting people are overrepresented among the non-responses. A similar problem is regarding the register-based data that exclude all people that for various reasons do not appear in official registers. In the context of this study, illegal immigrants is one of these groups that would increase the reliability of the study if included but now are missing from the data.

Using clustered standard error prevented us from displaying standardizes beta values in the data output resulting in difficulties when comparing the effects of the different variables in the data.

5 Results

In this section we will present the results from our regressions. We will start by examine the aggregated level models and then move on to the results from the multilevel analysis. Last is a discussion about the results and what conclusions that can be drawn.

By plotting the mean of general and local trust in each county against our diversity index we can see that there is a negative correlation between trust and diversity. The relation seems to be greater for local trust but it is negative for general trust as well, see Figure 1.

Although this is interesting, it doesnt show evidence that higher ethnic diversity has a negative impact on trust, it could be other variables affecting trust through the diversity variable. It is for example plausible that socioeconomic factors such as income and education are the underlying explanatory variables in the diversity-trust relation. In highly diverse areas socioeconomic factors tend to be worse compared to more homogenised areas. Diversity could therefor confound for these kinds of effects, which will lead to wrong conclusions. In order to make a correct analysis of the diversity-trust relation we need to control for other variables that could affect the outcome. As explained in the method part of the paper, we control for these variables by using regression analysis and thereby isolating the effect of ethnic diversity on trust. By using this method we
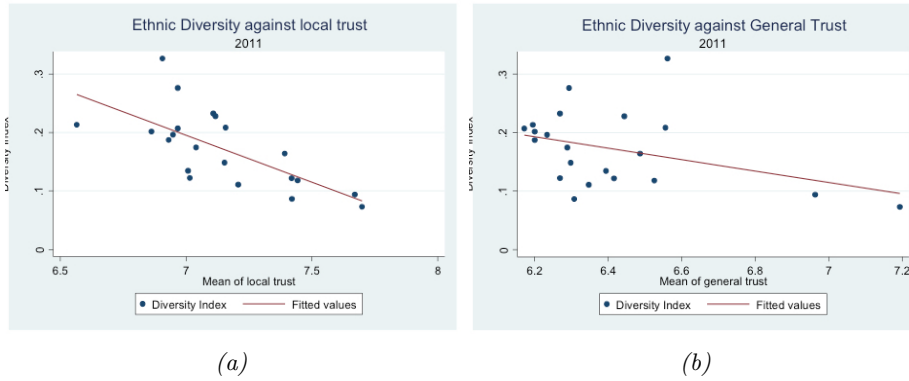
Figure 1: Ethnic diversity plotted against trust

can interpret the effect of diversity while holding other variables constant.

5.1 Aggregate Level Model

In table 1 and 2 the results from our regressions are displayed for local and general trust respectively. Each table shows 6 different regression models. In the models 1-3 we used the method of pooled OLS while model 4-6 are fixed effects. For the two different types, three different models are created. First, we ran a raw regression model with only our diversity index as the independent variable (model 1 & 4). We then extended our model and incorporated all the control variables (model 3 & 6).

With all the control variables included we encountered problems with multicollinearity since several of the variables are highly correlated. We were therefor forced to drop some independent variable in order to decrease the multicollinearity. Different researchers are using different rules for the acceptance level of VIF-values. In our study we used the acceptance level of VIF=10 according to Hair et al. (2014). However, in our final model we never encountered VIF-values over 5. The approach of dropping variables when facing high VIF-values are common but questionable since it can create problems of omitted variable bias (Hair et al. 2014). In our model, however, we still have three important theoretical variables that have been used frequently in previous studies.

In the tables below, our chosen models are number 2 and 5 were the former is without time effects and the latter is with time dummies included. As shown in the tables, the diversity index is significant in all models for both general and local trust. This implies that there is a robust and strong effect from diversity on trust.

5.1.1 Local Trust

In order to decide whether our chosen model is the pooled model or the fixed effects model we run a F-test to test if the time-dummies are jointly significant or not. Our hypotheses and result are as follows:

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	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Pooled OLS	Pooled OLS	Pooled OLS	Fixed effects	Fixed effects	Fixed effects
Diversity Index	-2.254***	-2.821***	-3.933***	-2.250***	-2.958***	-3.865***
	[0.386]	[0.630]	[1.131]	[0.408]	[0.616]	[1.162]
Unemployment		-0.046	-0.011		-0.067**	-0.039
		[0.029]	[0.031]		[0.028]	[0.033]
Education		0.944	-1.452		0.840	-1.315
		[0.674]	[1.311]		[0.643]	[1.372]
Rental apartments		-0.413	-0.847		-0.285	-0.768
		[0.740]	[0.800]		[0.629]	[0.784]
Population density			0.001			0.001
			[0.001]			[0.001]
Health			-2.021			-0.325
			[2.720]			[4.396]
Crime			-0.000			-0.000
			[0.000]			[0.000]
Average age			-0.116*			-0.105
			[0.060]			[0.071]
Income			-0.002			-0.002
			[0.005]			[0.005]
Observations	63	63	63	63	63	63
R-squared	0.345	0.409	0.449	0.367	0.449	0.476
time dummies	no	no	no	yes	yes	yes
county dummies	no	no	no	no	no	no

Note: results from linear regression on local trust, ranging from 0-10. Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 1: Local trust, county level

H_0 They are not jointly significant

H_1 They are jointly significant

$F(2,56)= 2.33$, $p\text{-}value = 0.1069$

The conclusion is that we cannot reject the null hypothesis and we can therefore not conclude that the time effect is significant. Our final model in the setting of local trust is thereby model number 2 in table 1. The dependent variable is the mean of local trust in each of the 21 counties in Sweden over a period of three years (2009-2011). This gives us a total number of 63 observations. Three control variables are included: The rate of unemployment, share of higher education and the share of people living in rental apartments. These variables are important to control for since they, if omitted, can bias the effect from our independent variable of main interest: diversity index. They are also frequently used in related research on the topic. The diversity index is significant at the one per cent level with a coefficient of -2.821. This suggest that if the diversity index would increase by 0.1 the mean of local trust would decrease by 0.2821. Our R2 value is 0.409, meaning that our model explains 40.9 per cent of the variety of local trust.

5.1.2 General Trust

In the same way as for the local setting we run a F-test to test if the time-dummies are jointly significant or not. Our hypotheses and result are as follows:

VARIABLES	(1) Pooled OLS	(2) Pooled OLS	(3) Pooled OLS	(4) Fixed effects	(5) Fixed effects	(6) Fixed effects
Diversity index	-0.588**	-1.131**	-1.254**	-0.634**	-1.111**	-1.308**
	[0.234]	[0.465]	[0.609]	[0.254]	[0.488]	[0.624]
Unemployment		-0.002	-0.004		0.001	-0.013
		[0.013]	[0.015]		[0.017]	[0.023]
Education		1.513***	0.849		1.944***	-0.385
		[0.435]	[0.777]		[0.395]	[0.841]
Rental apartments		-0.228	-0.794		-0.494	-1.121**
		[0.432]	[0.491]		[0.426]	[0.448]
Population density			0.000			0.001*
			[0.000]			[0.001]
Health			-0.192			4.171***
			[1.019]			[1.584]
Crime			0.000			0.000
			[0.000]			[0.000]
Average age			-0.049*			-0.119***
			[0.029]			[0.040]
Income			-0.001			-0.003
			[0.003]			[0.003]
Observations	252	252	252	252	252	252
R-squared	0.027	0.080	0.115	0.161	0.236	0.289
time dummies	no	no	no	yes	yes	yes
county dummies	no	no	no	no	no	no

Note: results from linear regression on general trust, ranging from 0-10. Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 2: General trust, county level

H_0 They are not jointly significant
H_1 They are jointly significant
$F(11,256)= 4.41$, $p\text{-}value = 0.0000$

The conclusion is that we reject the null hypothesis and we can therefore conclude that the time effect is significant. Our final model in the general trust is thereby model number 5 in table 2. In this setting we have much more observations since we have trust data from 2001-2012, which gives us a total number of 252 observations. The diversity index is significant at the five per cent level with a coefficient of -1.111, suggesting an increase in the index by 0.1 would decrease the mean of general trust by 0.1111. Education is also significant, at the one per cent level, showing a positive relation with a coefficient of 1.944. This is in line with intuition and theory; higher level of education is positively correlated with higher level of trust. The model captures 23.6 per cent of the variety of general trust.

As we can see the control variables are most often not significant in our models. This is not something to be concerned about since we are not interested in their effect on trust. Instead, the reason to include them is theoretical and the fact that they can, if omitted, affect the result from our variable of main interest – diversity index.

5.1.3 Interaction Effects

According to Lipset and Rokkan (1967, pp. 1-56) injustice towards a particular group of people in society can reinforce conflict between groups and weaken the possibility to reach understanding between people. From this theoretical approach, it is of interest to see if we have any interaction effects of ethnic diversity and other factors that especially affect minorities in our society. For example, unemployment is a variable of interest since the unemployment rate is much higher among people born outside of Sweden compared to people who were born here (Statistics Sweden 2015). The same goes for crime rate where people born outside of Sweden are overrepresented (Crime Prevention 2015). However, in our analysis the interaction effect was not significant why we choose not to add it in our model (see appendix A for the output with interaction effects).

5.2 Compositional and Diversity effect

What conclusion can be drawn from these figures? It shows that trust is lower in ethnic diverse areas but it does not, however, conclude that ethnic diversity affects trust negatively. One could easily draw that drastic conclusion, but that would not be correct since it does not differentiate between compositional and diversity effect. From trust surveys around the world we know that Nordic countries have an extraordinary high level of trust between people. In Swedish counties were the ethnic diversity is high, there are by definition more people that was born outside of Sweden and migrated from countries with a lower mean trust value. Due to the individual characteristics among people living in diverse areas the average trust value will be lower there compared to other areas. This is the compositional effect. This effect is indeed interesting but it is not the topic of this paper. Rather, we are interested in investigating if ethnic diversity is harmful for trust among people living in diverse areas. This is what we call the diversity effect.

5.3 Multilevel Model

In order to extend our analysis and control for the compositional effect we need to take individual characteristics into account and thereby control for the composition of the people living in the area. The main variable of interest here is the individual level variable labelled Nordic origin, this is a dummy variable measuring whether you are born in a Nordic country or not. By including this variable we can control for the compositional effect and thereby isolate the diversity effect. Furthermore, the individual data set allows us to control for several other individual characteristics.

5.3.1 Individual Control Variables

The individual variables are chosen according to previous research on the subject. In all of our multilevel models, individual health and education have a significant positive effect on both local and general trust. That is, healthy and higher educated people

are more trustful on average compared to unhealthy and low educated people. Being employed rather than unemployed is also positive in our models and significant in most. Women and older people tend to be more trustful than men and younger people. Higher income tends to increase the level of trust as well. Other individual variables included are: Living with children, Political opinion, Present class and Class of origin. As well as: Religious activity, Nordic origin and Living alone. The individual variables are included in order to control for individual characteristics among people. Further on, we will not pay attention to them and therefore not display them in the tables. Instead we will show if they are included in the model by typing yes/no in the row called Individual characteristics.

In table 3 and 4[3] the result from the multilevel analysis are displayed. The control variables at the aggregate level are chosen by the same method as in the aggregate level model. The final model is number 2 for both local and general trust. In this setting we took the analysis one step further by also looking at the change in the diversity index and its impact on trust (model 4).

VARIABLES	(1) Cross-section	(2) Cross-section	(3) Cross-section	(4) Cross-section
Diversity Index	-1.844***	-3.174***	-1.369	
	[0.347]	[0.670]	[1.655]	
Nordic origin		1.010***	0.960***	1.019***
		[0.137]	[0.152]	[0.140]
Rental apartments		1.027	0.183	-0.014
		[1.075]	[0.707]	[0.890]
Education		0.515	2.423*	-0.878
		[0.709]	[1.344]	[0.923]
Unemployment		-0.087**	-0.100***	-0.032
		[0.035]	[0.035]	[0.047]
Population density			-0.000	
			[0.001]	
Health			9.768**	
			[3.962]	
Crime			-0.000	
			[0.000]	
Average age			0.014	
			[0.064]	
Income			-0.002	
			[0.005]	
Change in diversity index				-9.845**
				[4.163]
Observations	4,508	3,447	3,385	3,447
R-squared	0.004	0.176	0.185	0.175
Individual characteristics	no	yes	yes	yes

Note: Results from linear regression on local trust, ranging from 0-10. Clustered standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Local trust, multilevel

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[3]In table 3 and 4 the variable Ethnic origin is included even though it is on an individual level. It is included among the aggregated level variables because it is the one that allow us to separate between the diversity and compositional effect.

VARIABLES	(1) Cross-section	(2) Cross-section	(3) Cross-section	(4) Cross-section
Diversity index	0.322	-0.544	-0.164	
	[0.614]	[0.635]	[2.152]	
Nordic origin		0.437**	0.403**	0.436**
		[0.155]	[0.164]	[0.154]
Rental apartments		-0.177	-1.226	-0.176
		[0.883]	[0.817]	[0.804]
Education		0.225	-0.413	0.194
		[0.681]	[1.967]	[0.595]
Unemployment		-0.057	-0.055	-0.040
		[0.037]	[0.058]	[0.040]
Population density			-0.000	
			[0.001]	
Health			7.121*	
			[3.758]	
Crime			0.000	
			[0.000]	
Averagre age			-0.056	
			[0.106]	
Income			0.001	
			[0.007]	
Change in diversity index				-3.363
				[3.099]
Observations	4,558	3,474	3,409	3,474
R-squared	0.000	0.147	0.154	0.147
Individual characteristics	no	yes	yes	yes

Note: Results from linear regression on general trust, ranging from 0-10. Clustered standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 4: General trust, multilevel

5.3.2 Local Trust

Model 2 in table 3 shows the result from the chosen model. As we can see, the diversity index is significant at the one per cent level with a coefficient of -3.174. This is suggesting that local trust will decrease by 0.3174 if the diversity index increases by 0.1. To put it into context, the greatest change in the diversity index from the year 2001-2012 is in Kronoberg County where the index rose from approximately 0.14 to 0.24. This would imply that the increase in ethnic heterogeneity caused local trust to fall with 0.3174 in Kronoberg County during those twelve years. The smallest change was found in Gotland County where the index only increased by approximately 0.02, accordingly local trust decreased with 0.006 points on the scale from 0 to 10 due to the increase in ethnic diversity. So even though ethnic diversity has a significant negative effect on local trust, the impact is quite small. The variable Nordic origin is also significant at the one per cent level. As discussed earlier this is an important variable in order to control for the compositional effect. The coefficient 1.010 suggests that people born in a Nordic country on average trust people by 1.010 more (on a scale from 0-10) compared to people born outside of the Nordic countries. Unemployment, at an aggregate level, is also significant implying that higher unemployment rate leads to lower level of local trust.

Model 4, table 3, displays the results from the change of the diversity index instead of the level. The coefficient is much larger with a value of -9.845 and significant at the

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five per cent level. These results capture an interesting observation about the trust-diversity relation. It suggests that it is not only the level of ethnic diversity affecting the level of trust between people, rather, with much larger effect, the change of diversity is important.

To conclude, our data shows evidence of a diversity effect on local trust. This suggests that ethnic diversity would be harmful for the level of local trust. The effect is larger when we look at the change rather than the level of our diversity index.

5.3.3   General Trust

Table 4, model 2 shows the chosen model for general trust. Note that in the setting of general trust the diversity index is not significant when we take individual characteristics into account and thereby control for the compositional effect. We can therefore, from the results of our study, not conclude that ethnic diversity has a negative impact on general trust. However, the Nordic origin variable is positive and significant meaning that people born in a Nordic country on average are more trustful. In our aggregated level model, when we did not take individual characteristics into account, the diversity index was significant. The conclusion is that people in ethnic diverse areas has a lower general trust due to compositional effect while our data do not show evidence that ethnic diversity is harmful for general trust (diversity effect).

5.4   Discussion

Our results show a negative correlation between ethnic heterogeneity and local trust. However, we did not find any significant correlation between ethnic diversification and general trust ones we controlled for the compositional effect. The impact from diversity on local trust is much larger when we look at the change of the diversity index rather than the level.

5.4.1   Main Results

The results are not surprising and in line with previous studies and theory on the topic. Trägårdh et al. (2013) find the same results, and the findings are in line with both the conflict theory and Putnams Constrict theory as they both argue for a negative diversity-trust relation. However, our study does not show if local trust is lower towards all people in a diverse setting (constrict theory) or if it just is lower towards the outgroup (conflict theory). We can therefore not say if our study is coherent with the conflict theory or Putnams thesis. That is a topic for further study of the diversity-trust relation.

However, regarding general trust we cannot find evidence for the conflict theory nor Putnams thesis. Instead Trägårdh et al. (2013) has a plausible explanation arguing general trust is robust and static over time as it is founded during childhood and therefore not affected by ethnic diversity.

5.4.2 Interaction Effects

That no interactions effects are found, in any setting, does not necessary imply that the theory of Rokkan and Lipset is invalid, instead the results can be caused by imprecise data. Crime and Unemployment, the variables for which interaction effects were tested, are indeed overrepresented among immigrants and therefor in areas with a high diversity index. However, unemployment is for example relatively low in the big cities, such as Stockholm, whereas the diversity index is relatively high. This seemingly contradictory fact is due to segregation – the relatively high diversification and unemployment are concentrated in some parts of Stockholm. Since our measures represent the average for the whole county a possible interaction effect might not be detected. With more accurate data, on a municipality or even smaller level, significant result might be found.

5.4.3 Omitted Variable Bias

If important variables are omitted our results could be biased. In the chosen model we dropped variables due to the risk of multicollinearity resulting in the final model with three aggregated control variables: Education, Rental apartment and Unemployment. These three variables are frequently used in previous research and are therefore important to include. However, there are more contextual variable that could be of interest in our model like mean-income and crime-rates. By dropping them we have a risk of omitted variable bias. Furthermore, there could be numerous of other variables omitted that we do not know of. This is a drawback with using regression analysis as method since you can never include all the important variables in the model.

5.4.4 Causality

The method of regression analysis is a good method to isolate the relation between the variable of interest and our dependent variable. It is, however, not a method for showing causality. Therefor we cannot, by looking at our data, conclude that ethnic diversity affects local trust negatively but merely that a correlation exists between the two variables. However, from a theoretical point of view it is likely to be a casual relation between diversity and the level of local trust since it is argued by both the conflict theory and Putnams thesis as discussed above. Another possibility is that the causality goes the other way around; Local trust has a negative effect on diversity in the area. From just looking at our data this relation is feasible, but taking theory and intuition into account it is more questionable. Arguing from this point of view, low level of trust would encourage immigrants to settle down in the area. A third feasible suggestion is that there are no relation between diversity and trust and that our results either are due to noise or that omitted variables are the explanation.

6   Conclusion

In this paper we investigated the relation between ethnic heterogeneity and trust in Sweden. Using data over peoples country of birth from Statistics Sweden, we created a diversity index and from the SOM-institute at University of Gothenburg we collected data over trust. Including numerous of control variables we ran regressions on both aggregated and individual level. The findings show a significant negative correlation between ethnic diversity and local trust. The impact on local trust is greater when looking at the change in ethnic diversity rather than the level. However, no significant results were found when general trust were examined nor did we find any evidence for Rokkan and Lipset theory regarding the importance of how cleavage structures in society emerge. The results are in line with previous Swedish research and could be explained by theories like the conflict theory and Putnam's constrict theory. We can however not say which one of these two theories fits better to our results since we do not know if local trust is lower towards all people (constrict theory) or just towards the outgroup (conflict theory). That is a question for further research. Furthermore, future research on this topic that use data on a municipality or even lower level in order to better investigate any possible interaction effects would be desirable.

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Appendix A   Robustness Tests

A.1   Tests for Multicollinearity

Variable	VIF
Diversity Index	3.03
Rental Apartments	1.92
Education	1.91
Unemployment	1.59
Mean	2.11

Table 5: Pooled OLS on local trust — the chosen model

Variable	VIF
Diversity Index	2.80
Rental Apartments	1.71
Education	1.85
Unemployment	2.63
Time Dummy 2002	1.85
Time Dummy 2003	2.05
Time Dummy 2004	1.99
Time Dummy 2005	2.00
Time Dummy 2006	1.96
Time Dummy 2007	1.98
Time Dummy 2008	2.11
Time Dummy 2009	1.99
Time Dummy 2010	2.05
Time Dummy 2011	2.07
Time Dummy 2012	2.14
Mean	2.08

Table 6: Fixed effects on general trust — the chosen model

Variable	VIF
Diversity Index	4.98
Rental Apartments	1.91
Education	3.98
Unemployment	1.55
Religious activity	1.09
Health	1.06
Employed	1.45
Children	1.43
Age	1.34
Political opinion, dummy 1	1.54
Political opinion, dummy 2	1.63
Class of origin, dummy 1	2.95
Class of origin, dummy 2	2.92
Class of origin, dummy 3	1.71
Education, dummy 1	2.74
Education, dummy 2	2.35
Household income, dummy 1	2.58
Household income, dummy 2	1.91
Ethnicity, dummy	1.08
Living alone	1.40
Sex, dummy	1.06
Mean	2.03

Table 7: Multilevel model on local trust – diversity index

Variable	VIF
Change in Diversity Index	2.04
Rental Apartments	1.55
Education	2.66
Unemployment	1.70
Religious activity	1.09
Health	1.06
Employed	1.45
Children	1.43
Age	1.34
Political opinion, dummy 1	1.53
Political opinion, dummy 2	1.63
Class of origin, dummy 1	2.95
Class of origin, dummy 2	2.92
Class of origin, dummy 3	1.71
Education, dummy 1	2.74
Education, dummy 2	2.35
Household income, dummy 1	2.58
Household income, dummy 2	1.91
Ethnicity, dummy	1.08
Living alone	1.40
Sex, dummy	1.06
Mean	1.82

Table 8: Multilevel model on local trust – change in diversity index

Variable	VIF	Variable	VIF
Diversity Index	4.98	Change in Diversity Index	2.05
Rental Apartments	1.90	Rental Apartments	1.55
Education	3.99	Education	2.66
Unemployment	1.56	Unemployment	1.71
Religious activity	1.09	Religious activity	1.09
Health	1.06	Health	1.06
Employed	1.45	Employed	1.45
Children	1.43	Children	1.43
Age	1.34	Age	1.34
Political opinion, dummy 1	1.53	Political opinion, dummy 1	1.53
Political opinion, dummy 2	1.63	Political opinion, dummy 2	1.63
Class of origin, dummy 1	2.94	Class of origin, dummy 1	2.94
Class of origin, dummy 2	2.91	Class of origin, dummy 2	2.91
Class of origin, dummy 3	1.70	Class of origin, dummy 3	1.70
Education, dummy 1	2.74	Education, dummy 1	2.74
Education, dummy 2	2.35	Education, dummy 2	2.35
Household income, dummy 1	2.57	Household income, dummy 1	2.57
Household income, dummy 2	1.91	Household income, dummy 2	1.91
Ethnicity, dummy	1.08	Ethnicity, dummy	1.08
Living alone	1.40	Living alone	1.40
Sex, dummy	1.06	Sex, dummy	1.06
Mean	2.03	Mean	1.82

Table 9: Multilevel model on general trust – diversity index

Table 10: Multilevel model on general trust – change in diversity index

A.2 Tests for Autocorrelation

In the aggregate level models we use panel data. Since it is a time component in this data we need to consider the risk of dealing with autocorrelation caused by correlation between the error terms. All the models were either inconclusive or showed no sign of autocorrelation. Below the Durbin-Watson test are presented:

Model	Durbin-Watson d-statistic	1 %	5 %
Fixed effect - general trust	DW (16,252) = 1.866	No	Inconclusive
Fixed effect - local trust	DW (7,63) = 2.211	No	Inconclusive
Pooled OLS - general trust	DW (5,252) = 1.779	No	Inconclusive
Pooled OLS - local trust	DW (5,63) = 2.238	No	No

Table 11: Durbin—Watson statstic for the choosen models

A.3 Interaction effects

Below are the outputs for the local trust multilevel models and the chosen aggregated models when we included interaction effects. However, the result was not significant why we choose not to include it in the previouse tables.

Model	Variable	Coefficient	P-value
Local trust + interaction	$Diversity \times Crime$	0.000	0.807
Local trust + interaction	$Diversity \times Unemployment$	0.089	0.825
General trust + interaction	$Diversity \times Crime$	0.000	0.149
General trust + interaction	$Diversity \times Unemployment$	-0.179	0.271

Table 12: Interaction effects - aggregated level

Model	Variable	Coefficient	P-value
Local trust - chosen model	$Diversity \times Crime$	-0.000	0.492
Local trust - chosen model	$Diversity \times Unemployment$	0.400	0.145

Table 13: Interaction effects - multilevel

Appendix B   Variables

B.1   County Level Variables

Variable	abbreviation	Description
Diversity Index	di	HH-Index over ethnic heterogenety using county of origin as proxy
Rental Apartments	rent	Percentage living in a rented apartment
Education	edu	Percentage with university education
Unemployment	emp	Percentage unemployed
Population density	den	Inhabitants per square kilometres
Health	heal	Percentage that receives compensation for sick leave
Crime	cri	Reported crimes per 100 000 inhabitants
Average age	age	The average age
Income	inc	Mean Income (except for income from capital)
Change in diversity index	-	Change in diversity index from 2001-2012 (general) and 2009-2012 (local)

Table 14: Explanation for county level variables

B.2 Indivdual Level Variables

B.2.1 Dependent Variables

- General Trust

  - Question: In your opinion, to what extent can people in general be trusted?
  - Scale: 0-10 where 0 is In general, people cannot be trusted and 10 is In general, people can be trusted.
  - Labelled in SOM-survey: ac10a

- Local trust

  - Question: In yout opinion, to what extent can people in your immediate surroundings be trusted?
  - Scale: 0-10 where 0 is In general, people cannot be trusted and 10 is In general, people can be trusted.
  - Labelled in SOM-survey: ac10b

B.2.2 Control Variables

- Political opinion

  - Question: Sometimes political opinion can be placed on a left/right scale. Where would you place yourself on such scale?
  - Scale: 1-5 where 1 is far left, 3 is in between and 5 is far right.
  - Labelled in SOM-survey: ba10.
  - Transformed by us into several dummies

- Religious activity

  - Question: How often have you prayed to god during the past 12 month?
  - Scale: 1-7 where 1 is 0 and 7 is several times per week.
  - Labelled in SOM-survey: bc20

- Health

  - Question: How good is your present state of health?
  - Scale: 0-10 where 0 is very bad and 10 is very good.
  - Labelled in SOM-survey: mf30

- Work

  - Question: which one of these groups do you currently belong to?
  - Scale: 0=not working, 1=working

– Labelled in SOM-survey: working

- Class of origin

    – Question: if you would describe your present home and the home where you grow up, which of the following alternative matches best? Where you grow up

    – Scale: 1 = blue-collar home, 2 = farmer home, 3 = white-collar home, 4 = Self-employed.

    – Labelled in SOM-survey: subclg

    – The scale is transformed by us

- Present class

    – Question: if you would describe your present home and your home where you grow up, which of the following alternative matches best? Present home

    – Scale: 1 = blue-collar home, 2 = farmer home, 3 = white-collar home, 4 = Self-employed.

    – Labelled in SOM-survey: subclh

    – The scale is transformed by us

- Education

    – Question: What education do you have?

    – Scale: 1 = low, 2 = middle, 3 = high.

    – Labelled in SOM-survey: edu3

    – The scale is transformed by us

- Household income

    – Question: How much is the approximated total yearly household income before tax?

    – Scale: 1 = low, 2 = middle, 3 = high.

    – Labelled in SOM-survey: hinc3rel

    – The scale is transformed by us

- Nordic origin

    – Question: Where did you mainly grow up?

    – Scale: 0-1, where 0 = Outside of the Nordic countries and 1 = In a Nordic country

    – Labelled in SOM-survey: growupp

- Living alone

- Question: How does your household look like? Do you live alone.

- Scale: 1 = yes, 2 = No

- Labelled in SOM-survey: hhtypela

- Transformed by us into dummy

- Children

  - Question: Do you live with children?

  - Scale: 0 = no, 1 = yes

  - Labelled in SOM-survey: Childha03, Childha46, Childha715, Childhao16

  - Sorted by us into dummy

- Sex

  - Question: Are you a man or a woman?

  - Scale: 1 = Woman, 2 = Man

  - Labelled in SOM-survey: sex

  - Transformed by us into a dummy

- Age

  - Register data

  - Labelled in SOM-survey: agereg