Economic inequality and General Trust

The relation between economic inequality and general trust in contemporary Europe

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Abstract

In this article, I analyse the relationship between economic inequality and general trust in Europe. I differentiated between inequality of outcome and inequality of opportunity and tested whether these concepts lowered general trust. After combining data from Eurostat and the European Social Survey , resulting in a dataset of 69820 native respondents from 9 European countries, I conducted a multilevel analysis. The outcomes of the analysis reveal that both forms of inequality do not significantly lower general trust. The effect of inequality of outcomes on general trust, however has gotten worse over the last decade in Europe.

Keywords

Inequality of Outcome, Inequality of Opportunity, General Trust, Multilevel, ESS

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Introduction

Economic inequality in Europe is high and rising. In 2016, an English CEO on average made 201 times more than the average worker, a Dutch CEO 171 times more and it is much of the same story in the rest of Europe (Melin, 2018). Where in 1980 the richest 10% earned 7 times more on average than the poorest 10%, this has currently increased to 9.5 times more (OECD, 2017). We should ask ourselves what the effects of this rising inequality are and whether these levels of inequality are desirable?

Earlier research has pointed towards far reaching consequences. Inequality is thought to lower a threefold of social constructs: social cohesion, social capital and general trust (Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997). These constructs are often referred to as the glue that is keeping society together. This 'glue' could be dissolving under the pressures of rising inequality. The concepts of cohesion, social capital and general trust are all closely related. Larsen (2013, p. 2) defines cohesion as "The belief held by citizens of a given nation-state that they share a moral community, which enables them to trust each other". He argues that cohesion is the enabler of general trust. Social capital, in turn is defined by Kawachi et al. (1997, p. 1491) as "the features of social organization, such as civic participation, norms of reciprocity, and trust in others, that facilitate cooperation for mutual benefit". Here, we learn that general trust is one of the main features of social organization which make up social capital. We can thus see that general trust is assumed to be at the root of the main societal effects of inequality.

The importance to research the concept of general trust, becomes clear when we consider the correlations it has to many other variables which are normatively seen as desirable, both on the individual and on the societal level (Rothstein & Uslaner, 2005). Examples on the individual level consist of giving more to charity, having a more positive attitude towards minorities and people who are generally trusting are even found to be more happy (Delhey & Newton, 2003; Helliwell & Huang, 2010; Uslaner, 2002). Correlations on a societal level are for example that, in regions where high general trust is high, there are better working democratic institutions, more open economies, even less crime and corruption (Beugelsdijk, de Groot, & van Schaik, 2004; R. D. Putnam, Leonardi, & Nanetti, 1994; Zak & Knack, 2001). Causation is hard to claim, also in this respect, but if that many correlations are found it does become an interesting concept to look into (Rothstein & Uslaner, 2005).

This paper will set out to see if general trust is truly related to economic inequality in Europe, by trying to find an answer to the following question:

How are economic inequality and general trust related in Europe and did this relationship change over time?

The literature on this topic indicates a strong correlation between income inequality and trust (Bjørnskov, 2006; Jordahl, 2007; Knack & Keefer, 1997; Leigh, 2006; Zak & Knack, 2001). Most of the research on this topic has been done either with data on the United States (See for example Fairbrother & Martin, 2013; Uslaner) or worldwide (Bjørnskov, 2006; Jordahl, 2007; Zak & Knack, 2001). Some research has been done in Europe (Gesthuizen, Van Der Meer, & Scheepers, 2009; Olivera, 2015), of which Olivera (2015) was the most recent using data from 2012. In this paper I will argue that new developments, call for a new consideration of this topic.

The new developments are related to the polarization thesis. This is one of the main theoretical mechanisms through which I expect economic inequality to influence general trust, which I will explain in more detail in the theory section. I expect that people often form ties with people who have similar incomes. People with similar incomes will, tend to flock together. This would result in different social groups. When the dissimilarities grow, the social barriers between these different groups will grow as well. This would result in a polarization of society, which would cause people to be less generally trusting.

Authors like Foa et al. (2017) propose that political polarization is on the rise in recent years. Perhaps events like Brexit, the rise in populism on both sides of the political spectrum in Europe in recent election such as in France (Le Pin) and Greece (SYRIZA), could be a sign of further polarization. It could be the case, that Olivera's (2015) results are outdated, because of these recent developments. This is why it is important to test the relation between inequality and trust again with more recent data. My dataset will be comprised of data from the European Social Survey and Eurostat, it contains data from 2008 up until 2016.

Another reason why my paper will be a meaningful addition to the existing literature, is that little research has been done on the inequalities of opportunity (Jordahl, 2007). The research that has been done found a negative effect of the inequality of opportunity on general trust (Rothstein & Uslaner, 2005). I will split the concept of economic inequality into the two concepts of outcome and opportunity and look into the effect of both on general trust.

This paper will be set up in the following way: in the theory section the main concepts will be introduced and the theoretical framework will be laid out. I will go on to describe the dataset, variables and analysis in the method section. Lastly I will discuss the results and conclusion.

Theory

This paper is concerned with the relation between inequality and trust. This relation has many different aspects. First, I will specify the kind of trust this paper is focussed on. Second, I will differentiate between inequality of outcome and the inequality of opportunity (Rothstein & Uslaner, 2005). Within the relation of inequalities of outcome on general trust I will discuss two mechanisms. The first mechanism I will discuss is on the micro level and the second on the macro level. Regarding the relation between inequality of opportunity and general trust I will only discuss one mechanism, concerning pessimism about the future.

Let me first explain the concept of general trust, as a specification of social trust. The broad concept of social trust can be understood as a possible or actual relation between individuals or entities in which person A (trustor) trusts person B (trustee) to cooperate instead of cheat (Jordahl, 2007). General trust is a form of interpersonal trust, which concerns the trust of a certain individual in strangers in society. It is different from particularized trust which concerns the trust of a certain individual in a particular group or individual in society (Uslaner & Brown, 2005). An example could help clarify the distinction between the two. A racist for instance, is someone who only trusts people of his own kind, which is different from trusting in general. General trust concerns trusting the general stranger. So general trust is the trust of person A in a unidentified person B to cooperate instead of cheat.

As I stated earlier economic inequality can be understood as twofold. It can be divided in the inequality of outcome and the inequality of opportunity (Rothstein & Uslaner, 2005). Inequality of outcome is the inequality that is depicted in society as the unequal distribution of resources (Rothstein & Uslaner, 2005). The inequalities of opportunity however are of a different kind. These are inequalities in the chances of achieving certain outcomes. Even when a society has highly stratified outcomes, it can have equal opportunities. An interesting feature of the equality of opportunity is that it disregards the inequalities which are due to a difference in effort (Jordahl, 2007). I will first discuss the inequality of outcome and then the inequality of opportunity.

Inequality of outcome

To understand how inequality of outcome and general trust are related, the existing literature proposes explanations both on the micro and on the macro level. I will first discuss the micro level explanation, after which I will discuss the macro level.

The micro level explanation rests on the homophily principle (McPherson, Smith-Lovin, & Cook, 2001). This principle suggests that people who are similar have a higher probability to have a social tie between them. Evidence has repeatedly been found for this theory (Alesina & La Ferrara, 2002; R. Putnam, 2007; van Oorschot & Arts, 2005). Most of the research in this field has focused on ethnic diversity, where the theory means that people of the same ethnicity have a higher probability to have a social tie. Evidence has also been found for the homophily principle in the field of economic inequality (Gesthuizen et al., 2009; Jordahl, 2007). When you apply the homophily principle to the field of economic inequality, the similarity of focus is that of income or wealth. When two individuals have a similar income they are more likely to have a social tie between them. This theory gives us the first step in the relation between income inequality and general trust.

To understand why a likelihood to have social ties create a likelihood to have more general trust, we look at Coleman (1990) and Fukuyama (1995), who suggested that familiarity breeds social trust. Having a social tie as Hardin (2006) puts it, both creates incentives to be trustworthy and facilitates knowledge about the others trustworthiness. When you know each other and it is likely that you will meet again, it is beneficial to honour trust.

When you have a social tie it is likely that you know each other and that you will meet again. As explained before trust is, understood here as, the relation where person A trusts person B to cooperate rather than to defect. Person A has to decide whether he will place trust in person B. And person B has to decide whether he will honour the trust put in him by person A or defect on that trust. If person A and person B have a social tie between them, they will both know that it is likely they will meet again. Person B will thus have to think not only about the one instance where he can either cooperate or defect, but also about the future instances where he engages in a trust relation with person A. This will most likely increase the costs of defecting. Because person A will learn that person B is not a trustworthy person after person B defects the first time. Which will result in person A no longer placing his trust in person B in later instances. This means that person B will most likely honour the trust in consideration of future

engagements. This makes person B a trustworthy person. Person A can thus, expect person B to honour trust. This makes it more likely for person A to place trust in person B if they have a social tie. This is how familiarity might breed trust. Which gives us the second step in our theory.

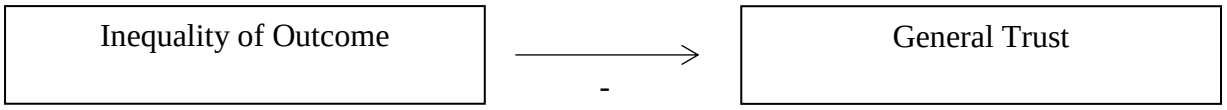
When we now take the first two steps together: people who are more economically similar will have more social ties to each other than to others who are less similar and when you have a social tie you are more likely to trust each other. We arrive at the third step, namely, that people who are economically similar will not only form more ties among each other but will also be more trusting to each other than people who are economically dissimilar.

When inequalities rise this means that there are less people around who are economically similar. When there are less people around who are economically similar, you will have less people to form social ties with, less people to trust (Gesthuizen et al., 2009). General trust is the trust you would place in a random stranger in society. If the probability that this stranger is similar to you decreases, the probability that you trust this stranger decreases as well. Which means, when inequality of outcome increases general trust decreases.

Next to this micro level explanation, there is a macro level explanation which goes slightly different. It starts out from the homophily principle, as well, McPherson et al (2001) proposes that people of the same income groups, tend to flock together. This explanation goes on to state that this flocking together causes the different socio-economic groups to drift further apart at the macro level. The rich and poor become segregated in an unequal society. They live separate lives. The poor and the rich may live close to each other, but they do not interact. Their children, for instance, go to different schools, they have different healthcare services; partly due to the fact that the poor simply cannot afford the same services as the rich can (Rothstein & Uslaner, 2005). The public becomes polarized. This causes the social barriers between groups to grow taller (Gesthuizen et al., 2009). When the barriers between groups grow taller, the sense of a shared fate might decline. The lack of contact between the two groups might also result in a lowering of shared norms and values. Which would result in less social solidarity. A lowering of a shared fate, shared norms and values and social solidarity in turn lowers the general trust within society (Rothstein & Uslaner, 2005).

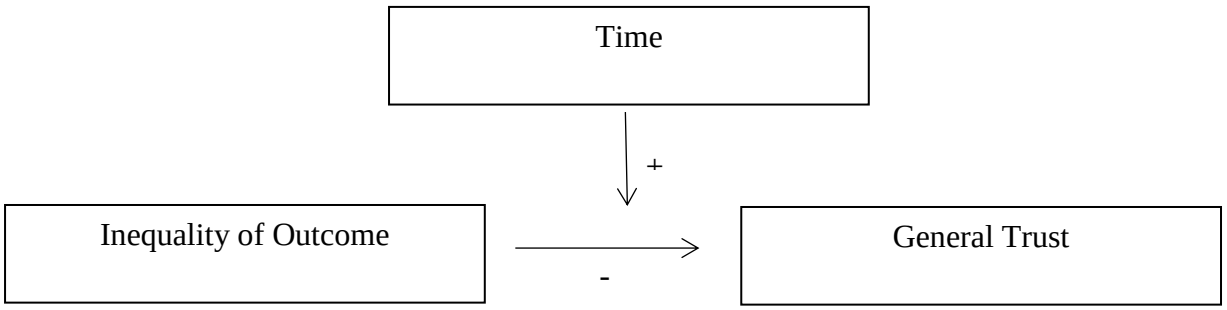
Both the micro and the macro level explanation point to the same hypothesis:

H1: Over the last decade in Europe, an increase in the inequality of outcome led to a decrease in general trust.



As mentioned in the introduction, political polarization is on the rise (Foa et al., 2017). Events like Brexit, the rise in populism on both sides of the political spectrum in Europe in recent election such as in France (Le Pen) and Greece (SYRIZA) could be a sign of this political polarization. One of the main theoretical mechanisms at the macro level, described above is the polarization of social groups and how that creates distrust. Political polarization might be a sign that this mechanism is growing stronger. When groups grow further apart their elected representatives will also grow further apart. Their statements will diverge further and further. As we have seen in recent Europe. This may indicate that the relationship between inequality of outcome and general trust is also growing stronger in recent years. This is why I expect:

H2: In Europe, the negative relation between inequality of outcome and general trust has been becoming stronger over the last decade.

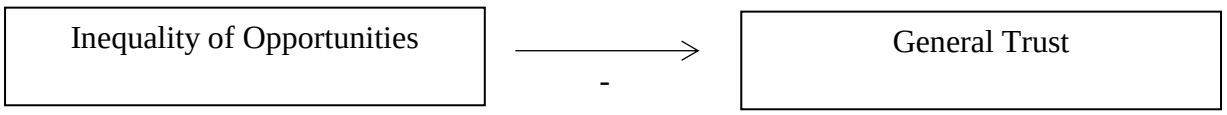


Inequality of opportunity

Then to discuss inequality of opportunity, this is the form of inequality that concerns the chances of achieving certain outcomes. A common form of inequality of opportunities are strong class divisions which hold over different generations (Rothstein & Uslaner, 2005). In such societies people do not have equal chances of achieving the same outcomes, since your resources are in part dependent on the social class you were born into. Other forms of inequality of opportunity can be gendered, racial, or of other kinds. However, in this paper I will focus on class.

Not much research has focussed on the relationship between inequality of opportunity and general trust. Rothstein & Uslaner (2005), however, did focus on this relationship and found support for a negative relationship between inequality of opportunity and general trust. What links inequality of opportunity to general trust is the optimism one holds about the future. Optimism about the future is considered a key determinant of social trust (Rothstein & Uslaner, 2005). If people at the bottom see the riches of the higher classes and no chance of achieving those kind of riches. When an individual lives in a society in which she has little chance of doing better than her parents. They will see the game as unfair. Because they see that others from higher social class families have an unfair advantage of achieving outcomes, just because of the social class they were born into. They will feel like the game is rigged against them, their believe that things will turn out well for them, will be lowered, their optimism about the future will decline. Because they believe that things will turn out bad for them, they will also start to believe that strangers will dishonour their trust. Their pessimism about the future spreads beyond their views about their own class position, it influences their trust in strangers as well (Uslaner, 2002). General trust, as stated before, is about trusting strangers. So, when there are high levels of inequality of opportunity individuals will become less trusting in general. Which leads to the last hypothesis:

H3: When over the last decade in Europe inequality of opportunity increased, general trust decreased.



Method

Dataset

To test the hypotheses this paper will make use of data from both the European Social Survey (ESS) and Eurostat.

The ESS aims to monitor public attitudes and values, to advance methods of cross-national survey measurement and to develop a series of European social indicators (ESS, 2017). The ESS has been conducted for eight waves, of which the first was in 2002 and the latest in 2016. This paper will make use of the waves four through eight, so from 2008 onwards. The first three waves are not suitable for this research since, some measures[1] considered in my analysis, were asked on a different scale in those first three waves. I would have been able to transform the scale of the first waves to that of the later waves, but I would have lost valuable variation within the scales. This is why I choose to only use data from the last five waves.

The ESS data was collected via an hour-long face-to-face interview. The survey applied strict random probability sampling and a minimum target response rate of 70%. The target population of the ESS are all persons aged 15 and over who are residing within private households in any of the countries the survey was conducted. The research was funded by the Observers, Guests and members of ESS European Research Infrastructure Consortium who represent national governments (ESS, 2017).

Eurostat is the statistical office of the European Union. This paper will make use of the statistics which Eurostat holds, on Income and Living Conditions (EU-SILC). This pertains to data on income distributions and social inclusion at the European level. EU-SILC does not rely on a common survey but rather a framework, which defines a harmonised set of target variables to be transmitted, by EU countries, to Eurostat. The way in which the data are gathered can differ per country but Eurostat sees to it that the data stays comparable through the common guidelines, procedures, concepts and classifications. The minimum sample size is 130,000 households and 270,000 persons per country. The target population includes persons within the national territory of age 16 and over.

The EU-SILC collects data every year. I will couple the EU-SILC data to the waves of the ESS, which were done every other year. So I will use data from 2008, 2010 up until 2016.

[1] Occupation of both the mother and the father were measured differently. These variables were needed to construct the inequality of opportunity measure.

The ESS has been conducted in 32 countries[2]. Eurostat has data on 36 countries [3]. There are nine countries who have participated in all waves from 2008-2016 in both the ESS and the EU-CILC.

The data I will use consists of these nine countries: Belgium, Finland, France, Ireland, the Netherlands, Norway, Poland, Slovenia, and the United Kingdom and five timeframes, consisting of every other year between 2008 and 2016.

Variables

General trust

To measure general trust I made use of self-reported general trust, as measured in the ESS with the question: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?". This question is often used when measuring general trust. Other influential surveys such as the World Value Survey (Inglehart, 2014) also use this question. The question was answered on a 10 point scale where 10 indicates full trust and 0 means: you can't be too careful. I have opted for this measure since it was the only measure of general trust available to me for all countries in the EU and it has been used before by respected institutions.

Inequality of outcome

To measure inequality of outcome I used the 20:20 ratio, as it was computed in the data from the EU-CILC. The 20:20 ratio measures how much the richest 20 percent receives compared to how much the poorest 20 percent in a country receives.

The EU-CILC data constructed the percentiles based on equivalised disposable income. Disposable income is the amount of income that can be spend, income after taxes, pensions or other social transfers. Equivalised means that it is the total income of a household divided by the number of household members. The EU-CILC has a specific way of determining who is considered a household member. They consider the first household member to be aged 14 or

[2] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom

[3] Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom, Iceland, Norway, Switzerland, Montenegro, The Former Yugoslav Republic of Macedonia, Albania, Serbia, Turkey

more as 1 person, each other household member aged 14 or more as 0,5 person and each household member aged 13 or less as 0,3 person.

The share of income in the quintiles of the income distribution was measured by equivalised disposable income. So the top quintile figure was measured by how much of the total equivalised disposable income was in the hands of the 20 percent that received the most equivalised disposable income. The 20:20 ratio was calculated by dividing the income share of the top 20 percent by the income share of the bottom 20 percent.

There are a lot of different inequality of outcome measures to choose from. For this research, I picked the 20:20 ratio. Jordahl (2007) states that the most important consideration when picking a measure of inequality, is which fits your theory best. In this paper, I theorize that, the society polarizes when inequality of outcome grows. My theory proposes that, people will find less people of their own kind around and thus feel less familiar with the general public, trusting the general public less. I expect this to be most evident on the extreme sides of the spectrum. One would expect differences in income between middle class earners to be less influential, than income differences between the top and the bottom of the distribution. This is why I picked the 20:20 ratio, which captures these differences at the extremes of the distribution, over for instance the Gini Coefficient, which disregards the location in the distribution of the differences in income (Jordahl, 2007). The measure of inequality of outcome I used is a variable on the country level. Which means that all individuals, belonging to the same country in my dataset, will have the same value for inequality of outcome. I named this variable 'Outcome'.

Inequality of opportunity

To measure inequality of opportunity, I want to measure the chances of achieving certain outcomes. As stated in the theory section, I expect social class to be of influence in achieving certain outcomes. The main way in which I expect your chances to be influenced, is that the class you grew up influences your outcomes. I would like to measure how much this is the case. I would, thus, like to measure how much your outcomes are dependent on the class you grew up in. In order to do this I will need a measure of outcome and a measure of the class you grew up in. The ESS collected data on the household income of the respondent and the occupational status of the parents of the respondent.

The household income of the respondent was measured as the decile of the income distribution the respondent belonged to in her country. This measure was chosen in order to be able to compare incomes between countries.

Both the occupational status of the mother and the father were measured on a nine point scale ranging from farm workers to professional and technical occupations. I reconstructed this variable into a ten point scale by adding the value 1, which I assigned to parents without a job. As I see being unemployed as the lowest occupational status.

I constructed a family status variable to which I assigned the status value of the parent with the highest status. I believe that the status of a family is best determined by the parent with the highest status. The ESS has data on mothers as well, which is special. I could have gone for the average status of father and mother but this would have produced biased results. I do not believe that a family with a mother who is an executive and a father who is a secretary, is of any higher status than a family with a mother who is an executive and a father without a job. Which would have been the result, had I opted for an average measure.

As a measure of inequality of opportunity I took the estimates of the regressions which tested to what extent the respondents income is dependent on the family status she grew up in. The stronger this relation is, the higher the inequality of opportunity. In a country where there is a strong relation, your income is highly dependent on the class you grew up in , so individuals have less equal chances of reaching the same outcomes.

I calculated this measure for each specific country and imputed the regression coefficients as a new variable named 'Opportunity'. All the relations were significant. The measure of inequality of opportunity I created is a variable on the country level. Which means all individuals belonging to the same country have the same value for inequality of opportunity.

Time

Time was measured in the ESS as the wave the respondent participated in. Since I only used wave 5 through 8, I recoded this variable in a way that a value of 1 corresponds with 2008 and the fifth wave, and a value of 5 corresponds with 2016 and the eighth wave.

Control variables

In order to avoid bias I needed to control for various alternative predictors of general trust. I controlled for gender, age, education, urbanization, occupational status, religion and Gross Domestic Product (GDP) per capita, since these are all variables claimed to possibly have an effect on general trust in addition to inequality (Gesthuizen et al., 2009; Olivera, 2015; Steijn & Lancee, 2011). For gender I computed a dummy where a value of 1 indicates a male. Education was measured using the International Standard Classification of Education (ISCED) which is a seven point scale, ranging from less than lower secondary (1) to higher tertiary

education (7). Urbanization was measured on a five point scale ranging from 'a farm or home in the countryside' (5) to 'a big city' (1). I rearranged the scale so that 'a farm or home in the countryside' corresponds with 0 and 'a big city' corresponds with 4, as this seemed more intuitive. Now, a higher number means more urbanization. Occupation was measured in the ESS by using the latest version of the International Standard Classification of Occupations (ISCO-08). I transformed the ISCO-08 scores into ISEI-08 scores which is a measure of occupational class. I did this by making use of Ganzeboom's (2018) instructions on how to do so. The ISEI-08 has values ranging from 11 (lowest status) to 88 (highest status). Religion was measured via a dummy variable which has a value of 1 if a respondent considers herself to belong to a certain religion or denomination and 0 if not. GDP per capita was measured by the EU-CILC in Euros. This is the only country level control variable I will consider.

Descriptive statistics

Table 1. Descriptive statistics of unstandardized variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
General trust	69820	0	10	5.354	2.337
Outcome	69820	3.200	5.400	4.201	.610
Opportunity	69820	.166	.406	.262	.063
Time	69820	1	5	3.176	1.333
GDP per capita	69820	9.400	79.100	36.080	15.656
Urbanization	69820	0	4	1.946	1.228
Religion	69820	0	1	.562	.496
Education	69820	1	7	3.932	1.893
Status	69820	11	88	43.555	21.636
Age	69820	14	105	49.870	17.685
Man	69820	0	1	.482	.500

Table 1 gives an overview of the descriptive statistics of all the variables included in my analysis. We can see that on average people were more trusting than careful. Furthermore, we see that on average the richest quintile earned 4.201 times more than the poorest quintile. We see that on average when the family status rose one category, the income quintile the children belonged to, increased by .262. From the mean of the time variable which is 3.176, we can take away that there are more respondents in the latter half of the waves then in the first half. The

mean GDP per capita of the countries in our data is 36.080. Furthermore, we can see that GDP per capita has quite a big range, from 9.400 to 79.100. This means that there is a considerable variation in how rich the countries in my sample are. On average our respondents live in a town or a small city, which is what the value of 2 corresponds with on the urbanization scale. We furthermore see that 56.2 percent of our sample identifies as belonging to a religion. We can see that on average our respondents completed upper tier upper secondary education, which corresponds with a value of 3 on the EISCED scale and that on average our respondents fall in the middle of the occupational status scale. The average age of our respondents is 50 years old and 48.2 percent of our sample are male.

Table 2. Means of main variables through time

Year	N	Opportunity	Outcome	General trust
2008	8952	.256	4.153	5.156
2010	14983	.258	4.251	5.336
2012	15831	.262	4.193	5.355
2014	14905	.265	4.219	5.375
2016	15149	.265	4.171	5.466

From table 2 we can see that inequality of opportunity has increased over the last decade, inequality of outcome has stayed more or less the same and general trust increased.

Table 3. Means of main variables between countries

Year	N	Opportunity	Outcome	General trust
Belgium	7773	.245	3.921	5.125
Finland	7664	.236	3.627	6.656
France	8840	.235	4.380	4.495
United Kingdom	7927	.347	5.158	5.381
Ireland	8918	.219	4.689	5.245
Netherlands	8531	.220	3.797	5.993
Norway	7338	.199	3.479	6.714
Poland	7519	.329	4.937	4.107
Slovenia	5310	.373	3.498	4.239

From table 3 we can gather that there are differences on both forms of inequality and general trust between countries.

Analysis

Multilevel linear model

For the analysis I plan to do in this paper, a multilevel linear modelling approach seems the best fit. I am dealing with respondents who are grouped within countries. This means my data is hierarchical. I have information both on the individual level and on the country level. On the individual level I am looking at gender, age, religion, education, urbanization, occupational status and general trust. On the country level I am interested in the inequality of opportunity, inequality of outcome and GDP per captia.

The benefit of using a multilevel linear model approach over a multiple regression is that I do not have to assume homogeneity of regression slopes or independence (Field, 2000). In a multiple regression I would have to assume that the relationship between the covariate and the outcome is the same over all groups that make up my predictor variable (Field, 2000). Also I would have to assume that the errors are independent of each other between different groups (Field, 2000). By using a multilevel linear model I do not have to adhere to both of these assumptions. By using a multilevel model I do not have to treat the units of analysis as independent observations. By not having to do this I lower the risk of underestimating the standard errors.

One of the downsides to using a multilevel linear model is that some statistics or plots are harder to obtain, such as the explained variance (R^2) and the Variance Inflation Factors (VIF). In order to estimate these statistics I conducted a multiple regression as well. According to LaHuis et al. (2014) this solution comes with acceptable levels of bias.

Assumptions

A multilevel linear model assumes linearity, a normal distribution of residuals (Both overall and between countries), homoscedasticity and no multicollinearity. I tested to see if there were any indications that these assumptions were violated. To check for linearity I used a simple scatterplot. To check for the normal distribution of residuals and homoscedasticity, I used scatterplots from the multiple regression. There was no indication that these assumptions were violated based on the scatterplots. To check for multicollinearity I considered the VIF scores from the multiple regression. Based on these VIF scores, multicollinearity seemed to be a problem, especially with my interaction term (VIF=67.733). To tackle this, I standardized all non-dummy predictors in my model, after which the problem with multicollinearity seized to exist. Two assumptions of the multilevel model I was not able to check, were the normal distribution of the random intercepts and slopes between the different countries.

Fixed and random effects

When using a multilevel linear model you need to consider which variables you will put in as fixed effects and which as random. But also, whether you want your intercept as fixed or random. In my model I have opted to include my intercept as both fixed and random. Because I expect differences in general trust over the whole sample and within countries. I furthermore opted to set gender, age, religion, education, urbanization, occupational status, GDP per capita, outcome, opportunity, time and the interaction between time and outcome, to fixed effects, as I expect an effect of those variables on general trust on average, over all countries combined. Lastly, I set gender, age, religion, urbanization, education and occupational status to random effects, as I expect the slopes of the relation of those variables on general trust to differ between countries.

Covariance structure

Another thing to think about when using multilevel linear models, is to specify which covariance structure you will use for your random effects. This is important, because when you pick a covariance structure that is too simple, you risk the chance of making a Type I error, finding a significant parameter when actually there is not one. But when we pick a covariance structure that is too complex you risk the chance of making a Type II error, finding a non-significant parameter when actually it is significant (Field, 2000).

I considered using five, Variance Components (VC), Diagonal, Autoregressive 1 (Ar1), Compound Symmetry (CS) and Unstructured (UN). As stated in Field (2000), the Variance Components structure assumes that each variance is the same and that all variances are independent, so all covariances are 0. The Diagonal structure assumes that variances are heterogeneous and also that all covariances are 0. Autoregressive structure 1 assumes that the relationship between variances chances in a systematic way, this is often the case with repeated measures. As I do not have repeated measures, I do not expect this to be the best fit. Unstructured assumes that the covariances are completely unpredictable and do not conform to a systematic pattern. Compound Symmetry structure assumes that all variances and covariances are equal. As I have different measurement scales this is not probable in my model.

Table 4. Model Fit for different covariance structures

	VC Model	Diag Model	AR1 Model	CS Model	UN Model
AIC	302260.268	302260.268	302325.293	302328.790	Uncertain

To test the model fit I used the Akaike's Information Criterion (AIC), this is a goodness-of-fit measure that corrects for model complexity. The Unstructured covariance structure failed to achieve convergence so the validity of the model fit is uncertain. However, the other structures did achieve to converge. Of the other structures, Variance Components produced the model with the best fit together with Diagonal, as you can see in table 3 since I have no reason to expect the variances to be heterogeneous, I will go on to use the Variance Components, covariance structure.

Significance level

I will be testing with a significance level (alpha) of .05. As I think this level of standard errors is acceptable to assume a significant effect.

Missing data

For my analysis I chose to disregards all cases that had missing values on any of the variables. This method is often referred to as 'listwise deletion'. In doing so I deleted 14301 cases. I believe this method is acceptable, since the remaining sample still consists of 69820 cases.

Table 5. Multilevel linear analysis on General Trust

			Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Fixed	b	Intercept	5.329***	5.248***	5.259***	5.232***	5.226***
		Man		.095***	.100*	.100*	.100*
		Age (std.)		.089***	.086*	.088*	.089*
		Education (std.)		.362***	.378***	.377***	.376***
		Status (std.)		.151***	.145***	.145***	.146***
		Religion		.061***	.048	.050	.050
		Urbanization (std.)		-.023**	-.011	-.010	-.011
		GDP per capita (std.)				.167***	.175***
		Outcome (std.)				-.013	-.075
		Opportunity (std.)				-.017	-.018
		Time (std.)					-.013
		Time*Outcome (std.)					-.050***
Random	s^2	Residual	4.669***	4.462***	4.433***	4.431***	4.430***
		Intercept	.838*	.768*	.816*	.580*	.537*
		Man			.012	.012	.012
		Age (std.)			.007	.008	.008
		Education (std.)			.017*	.017*	.016*
		Status (std.)			#		
		Religion			.010	.010	.010
		Urbanization (std.)			.007	.007	.007
AIC			305793.214	302653.285***	302302.948***	302279.543***	302260.268***
ICC			.152	.147	.155	.116	.108

N= 69820, * = p<.05, ** = p<.01, *** = p<.001, # = redundant variable

Results

From table 5 we can see that, with no explanatory variables added into the model, there are significant differences between countries on general trust (s^2=.838, Wald Z=2.120, p=.034). We can furthermore see that in model 1, 15.2 percent of the variance on general trust occurs between countries (ICC=.152). The Intraclass Correlation Coefficient (ICC) measures how much of the variation in my dependent variable, general trust, lies between countries. I calculated it by taking the intercept of my random effect and dividing it by the sum of that intercept and the residual. We can see that adding variables on the individual level lowers the ICC. Which is what we would expect.

With all the fixed effects of the individual level variables added in Model 2 we can see that the model fit increased significantly (Chi^2=3139.929, df=6, p<.001). To test this I did a Chi2 test on the difference in AIC, as the degrees of freedom I took the amount of new parameters added to the model. When the model was of a significantly better fit than the previous one, I indicated this with an */**/*** behind the AIC in Table 3. Furthermore, we can see that all of our fixed effects of the individual level control variables are significant predictors for general trust. Which means that on average, across the entire sample of all countries, there is evidence that our individual level control variables predict general trust. Also, we see that there still are significant differences between countries on general trust (s^2=.768, Wald Z=2.120, p=.034).

If we then add the random effects of the individual level variables into our model, which gives us Model 3, we can see that the model fit again increases significantly (Chi^2=350.337, df=6, p<.001). However, occupational status is seen as a redundant variable and SPSS was not able to calculate its random effect. This could be due to there being too little variance between countries on occupational status. Because of this I have not included the random effect of occupational status in further models. SPSS already excluded this variable from its calculations for Model 3, so it should give the correct estimates for the other variables. We can see that the fixed effects of religion and urbanization seize to be significant when we control for the random effects of the individual level control variables. Furthermore we can see that only the random effect of education is significant (s^2=.017, Wald Z=1.978, p=.048). Which means that only the effect of education on general trust significantly differs between countries. Still, we see that there are significant unexplained further differences between countries on general trust(s^2=.816, Wald Z=2.114, p=.035).

Adding the country level variables to the model, which gives us Model 4, also causes the model fit to increase significantly (Chi^2=23.405, df=3, p<.001). Both the random and the

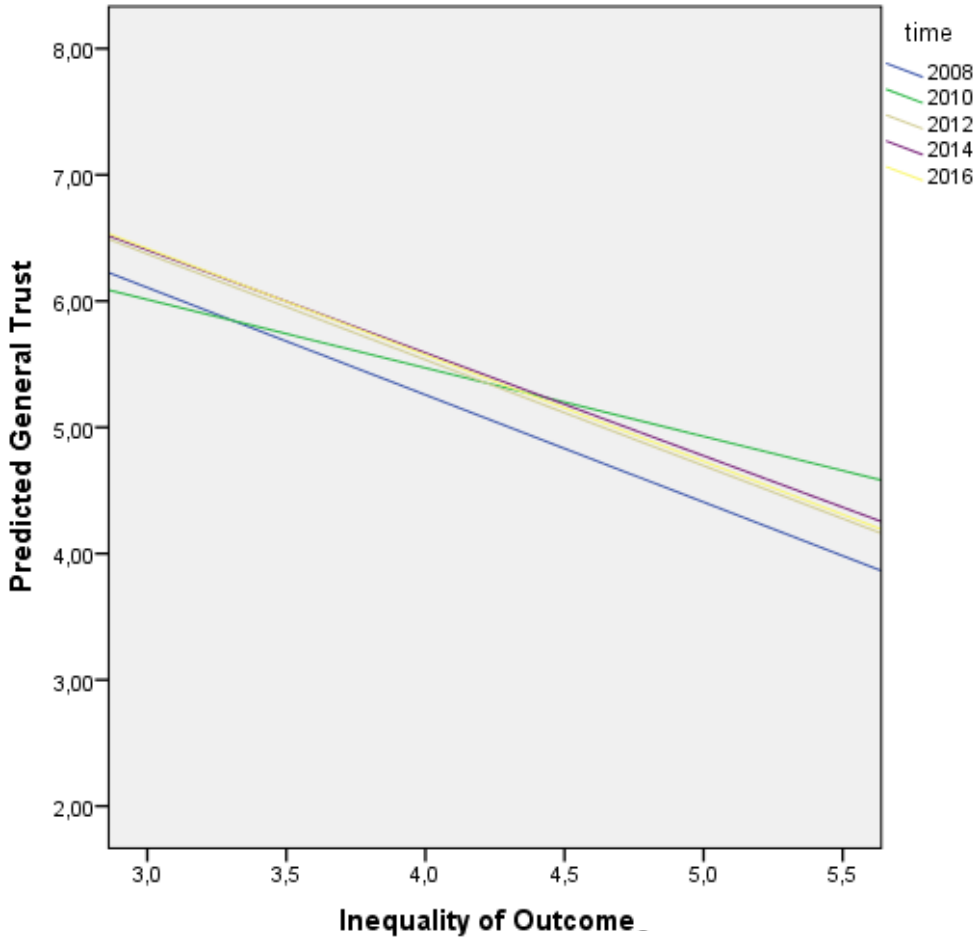
fixed effects of the individual control variables that were significant remain to be so. The fixed effect of GDP per capita proves to be a significant positive predictor of general trust (b= .174, t=4.018, p<.001). Which means that on average, over all countries, a higher GDP per capita results in a higher level of general trust. Both inequality of outcome (b=-.0215, t=-.275, p=.784) and inequality of opportunity (b=-.018, t=-.766, p=.444) have a negative relation with general trust. However both relations are not significant. Which means there is no indication of an effect of both forms of inequality on average over all countries on general trust.

After doing the last additions to the model, adding time and the interaction effect of time and the inequality of outcome, creating our Model 5, the model fit increased significantly as well (Chi^2=19.275, df= 2, p<.001).

We can see that, controlled for the fixed and random effects of gender, age, education, religion and for the fixed effects of status, GDP per capita, inequality of opportunity, time and the interaction of time on outcome, there is negative insignificant fixed effect of inequality of outcome on general trust of b=-.078 (t=-1.632, p=.103). If this effect was significant this would mean that, on average over all countries, when all other variables are kept on the mean, or 0 for the dummies, and inequality of outcome increases by one standard error (.610), general trust will decrease by .078 on the ten point scale. We can furthermore see that controlled for all other effects there is a negative insignificant effect of inequality of opportunity on general trust of b=-.018 (t=-.764, p=.445) as well.

There is however, a significant negative fixed effect, when controlled for all other effects, of the interaction term between time and inequality of outcome on general trust of b=-.046 (t=-4.819, p<.001). As we can see in figure 1, the slopes of the different years intersect, so the effect of inequality of outcome on general trust differs between timeframes. The estimate of .046 tells us that, on average, over all countries, when all other variables are kept on their means and time increases by one standard error, the negative effect of inequality of outcome on general trust increases by .046.

Figure 1. Interaction of time and Inequality of Outcome on General Trust



Furthermore we can see, from table 5, that the fixed effect of time itself, is not a significant predictor of general trust (b=-.009, t=-.973, p=.330). Which means that on average, over all countries, there are no indications that, general trust changed over time, contrary to what I expected from looking at the means in the method section.

In my final model, a significant amount of unexplained variance between countries remains (s^2=.533, Wald Z=2.064, p=.039). Of the unexplained variance, 10.8 percent lies between countries (ICC=.108). Which is a decrease in comparison to my first empty Model 1 in which 15.2 percent of the variance lay between countries. This means I explained more of the variance between countries than within countries with my model.

To see what the amount of the total variance in general trust is explained by my complete model, I would like to report the R^2 statistic. This is, however, quite complicated to get out of a multilevel linear model. The solution I opted for was to report the R^2 from a multiple regression. According to LaHuis et al. (2014) this solution comes with acceptable levels of bias. I constructed a multiple regression model in the same way as my multilevel model 5 except for

the random effects. This model had a R^2, explained variance, of .132. Which means that 13.2 percent of the variance in general trust is explained by my model.

Conclusion

In this paper, I set out to see what the effects of the rising inequality during the past decade in Europe were. I hypothesized first, that inequality of outcome would have a negative effect on general trust, second that this effect has been getting stronger and third that inequality of opportunity would also have a negative effect on general trust. I did not find support for my first and third hypothesis. I did however find support for my second hypothesis.

Hypothesis 1

I found a negative effect of inequality of outcome on general trust in Europe over the past decade. However, this effect was not significant. The direction of the effect was as I expected. I expected a rise in inequality to cause a demise of general trust, which my research indicated as well. However this effect was not present enough to be significant. Because of this, my findings indicate that there is no relation between inequality of outcome and general trust over the past decade in Europe. This is not in line with earlier research on the relation between inequality of outcome and general trust in Europe (for instance, Gould & Hijzen, 2016). Earlier research found significant indications of a negative effect of inequality of outcome on general trust.

My findings are neither in line with the micro nor the macro level theory on inequality of outcome. The micro level theory originated from McPherson's (2001) homophily principle and Coleman's (1990) theory on how familiarity breeds trust. The homophily principle states that people who are more similar, in my case economically, are more likely to form social ties between them. I combined this with Colman's theory, which states that, those who have a social tie are more trusting towards each other. What follows from the combination of these two theories, is that when economic inequality rises, people become more economically dissimilar and trust between people decreases causing general trust to decrease. The macro level theory focuses on the polarization of the public as proposed by Rothstein & Uslaner (2005). This theory states that as inequality rises, the rich and poor get segregated in society. What causes the barriers between the two groups to grow taller, leading to the polarization of society. Which in turn causes the public to become less generally trusting. Both explanations are not supported

by my research. That I did not find the expected effect could be due to methodological or theoretical flaws.

The fact that I only compared 7 countries could have been a methodological flaw. Earlier research from Gould & Hijzen (2016) for instance compared 25 countries. Because I used so little countries it was harder to find an effect. The more countries you compare the more power you have and the easier it is to find an effect. Another possible methodological issue is that I was not able to confirm the assumptions of the normal distribution of the random intercept and slopes, which you make when conducting a multilevel linear model analysis. Both these methodological flaws apply to the whole analysis so other outcomes could have been affected as well.

It could also be the case that the theory I proposed is flawed. It could for instance be that being similar does not cause people to form ties between them, that inequality does not necessarily lead to polarization, or that any of the other mechanisms are not at play. My research unfortunately was unable to test specific mechanisms of my theoretical framework. I was for instance unable to test the homophily principle, how familiarity might breed trust or whether inequality leads to the polarization of society. Due to lack of data, I have solely focussed on the overall effect, I was not able to open the black box between inequality of outcome and trust.

I would recommend further research to include more countries in order to heighten the chance of finding an effect and to look into which specific mechanisms are at play.

Another theoretical flaw worth mentioning here is, that there are authors who propose a relation between inequality of outcome and general trust of reversed causality. Rothstein & Uslaner (2005) propose that countries which have a low amount of general trust, will have less support for equalizing policies. To find support for equalizing policies you need a people who are considerate with their fellow countrymen, to see them as worthy of equalizing policies. You need a population who regards each other as similar or at least similarly worthy of receiving the same outcome. In a society where general trust is high, individuals trust others. They may feel like others will not abuse benefits handed to them by the government. In a trusting society support for equalizing policies could thus be easier to be found than in societies which are less trusting. Through equalizing policies, general trust could lead to lower inequality, instead of inequality leading to lower levels of general trust. This would not directly explain why I did not find a relation. A multilevel linear model would also give significant results if the relation went in the reversed direction. However, this theory is something to consider when interpreting the results of future research, where effects might indeed be found.

Hypothesis 2

Apart from the fact that I did not find indications of a relationship between inequality of outcome and general trust overall, I did find a significant effect of time on that relation. I found evidence, that the negative effect of inequality of outcome on general trust has been becoming stronger over the past decade in Europe. Which is in line with my expectation based on the political polarization of Europe in recent years (Foa et al., 2017). I expected that, since polarization is one of the mechanisms causing a decline in general trust and this polarization has been becoming more prevalent in the political sphere of Europe, the negative relation between inequality of outcome and general trust was getting worse. This theory is supported by my findings.

That the overall effect between inequality of outcome and general trust was not significant is not problematic for this finding. That the effect was not found to be significant does not mean the effect could not have been getting significantly stronger over the past decade.

The methodological flaws proposed at the first hypothesis also pertain to the testing of this hypothesis. However, a shortcoming of my research pertaining specifically to the testing of the second hypothesis, could be that I measured the concept of polarization through time. Using time as a measure of polarization is tricky. Time as a variable in this research, includes everything that has happened over the past ten years. It could be that something other than polarization caused the effect to be significant. I tried to prevent this by controlling for variables which have been found to have a relation to general trust. But it could still be that something other than polarization was responsible for the relation between time and the effect of inequality of outcome on general trust. Future research should try to measure polarization directly instead of indirectly through time.

Hypothesis 3

Lastly I found no evidence of a relation between inequality of opportunity and general trust in Europe over the last ten years. I found a negative relation, so the direction is as I predicted, but the effect was not present enough to be significant. Which is not in line with earlier research on this topic done by Rothstein and Uslaner (2005).

I have not found evidence for the theory on optimism about the future proposed by Rothstein and Uslaner (2005). Which stated that rising inequality of opportunity would cause people at the bottom to become pessimistic about the future, leading them to become less trusting towards strangers. I did not find however, that inequality of opportunity led to a decrease in generally trust.

That I did not find the effect I expected could again be due to the methodological issues already discussed. It could also be due to the fact that I operationalized inequality of opportunity as the average influence of the class you grew up in on your economical position. This operationalization does not capture all the aspects of having equal changes in reaching outcome. Take the concepts of gender and race which were not included in this measure for instance. Future research should use a more complete measure of inequality of opportunity.

Another shortcoming of my research is that I did not take into account the perceptions of inequality of opportunity. My theory argues that the decrease in general trust is caused by pessimism about the future caused by the perceived inequality of opportunity. It could be the case that the actual degree of inequality of opportunity is different from the perceived degree of inequality of opportunity. Future research should also take the effect of perceived inequality of opportunity into account.

I set out to see what the effects of the rising inequalities in Europe are. Form my finding that the negative effects of inequality of outcome on general trust have been rising over the past decade in Europe, we have an indication that the effects of inequality are getting worse. The question, whether these levels of inequality are desirable, remains.

References

Alesina, A. F., & La Ferrara, E. (2002). Who Trusts Others? *Journal of Public Economics*, *85*, 207–234.

Beugelsdijk, S., de Groot, H., & van Schaik, A. (2004). Trust and economic growth: a robustness analysis. *Oxford Economic Papers*, *56*(1), 118–134.

Bjørnskov, C. (2006). Determinants of generalized trust: A cross-country comparison. *Public Choice*, *130*, 1–21.

Coleman, J. (1990). *Foundations of Social Theory*. Camebridge MA: Harvard University Press.

Delhey, J., & Newton, K. (2003). Who trusts?: The origins of social trust in seven societies. *European Societies*, *5*(2), 93–137.

European Social Survey (2017). ESS Round 8 (2016/2017) Technical Report. London: ESS ERIC

Fairbrother, M., & Martin, I. W. (2013). Does inequality erode social trust? Results from multilevel models of US states and counties. *Social Science Research*, *42*(2), 347–360.

Field, A. (2000). *Discovering Statistics Using Ibm Spss Statistics*. (M. Carmichael, Ed.) (fourth). London: Sage Publications.

Foa, R. S., Mounk, Y., & Brähler, E. (2017). The Signs of Deconsolidation. *Journal of Democracy*, *28*(1), 5–15.

Fukuyama, F. (1995). *Trust: The Social Virtues and the Creation of Properity*. New York: Free Press.

Ganzeboom, Harry B.G.; Treiman, Donald J., "International Stratification and Mobility File: Conversion Tools." Amsterdam: Department of Social Research Methodology,

Gesthuizen, M., Van Der Meer, T., & Scheepers, P. (2009). Ethnic diversity and social capital in Europe: Tests of putnam's thesis in European countries. *Scandinavian Political Studies*, *32*(2), 121–142.

Gould, E. D., & Hijzen, A. (2016). *Growing Apart, Losing Trust? The Impact of Inequality on Social Capital Growing Apart, Losing Trust?*

Hardin, R. (2006). *Trust*. Cambridge, UK: Polity Press.

Helliwell, J. F., & Huang, H. (2010). How's the job? Well-being and social capital in the workplace. *Industrial and Labor Relations Review*, *63*(2), 205–227.

Inglehart, R., C. Haerpfer, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, E. Ponarin & B. Puranen et al. (eds.). 2014. World Values Survey: Round Six - Country-Pooled Datafile Version:

ww.worldvaluessurvey.org/WVSDocumentationWV6.jsp. Madrid: JD Systems Institute.

Jordahl, H. (2007). Inequality and Trust. *IFN Working Paper*, *715*.

Kawachi, I., Kennedy, B. P., Lochner, K., & Prothrow-Stith, D. (1997). Social capital, income inequality, and mortality. *American Journal of Public Health*, *87*(9), 1491–1498.

Knack, S., & Keefer, P. (1997). Does Social Capital Have an Economic Payoff? *The Quarterly Journal of Economics*, *112*(4), 1251–1288.

LaHuis, D. M., Hartman, M. J., Hakoyama, S., & Clark, P. C. (2014). Explained Variance Measures for Multilevel Models. *Organizational Research Methods*, *17*(4), 433–451.

Larsen, C. A. (2013). The Rise and Fall of Social Cohesion. *The Rise and Fall of Social Cohesion*, 3–28.

Leigh, A. (2006). Trust, inequality and ethnic heterogeneity. *The Economic Record*, *82*(258), 268–280.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology*, *27*(1), 415–444.

Melin, A. (2018, January 23). Executive Pay. *Bloomberg*. Retrieved from https://www.bloomberg.com/quicktake/executive-pay

OECD. (2017). *Understanding the Socio-Economic Divide in Europe*. Retrieved from https://www.oecd.org/els/soc/cope-divide-europe-2017-background-report.pdf [10.12.2017]

Olivera, J. (2015). Changes in Inequality and Generalized Trust in Europe. *Social Indicators Research*, *142*, 21–41.

Putnam, R. (2007). E pluribus unum: Diversity and community in the twenty-first century the 2006 Johan Skyette Prize Lecture. *Scandinavian Political Studies*, *30*(2), 137–174.

Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1994). *Making democracy work: Civic traditions in modern Italy.* Princeton university press.

Rothstein, B., & Uslaner, E. M. (2005). All for All: Equality, Corruption, and Social Trust. *World Politics*, *58*(1), 41–72.

Steijn, S., & Lancee, B. (2011). *Does income inequality negatively affect general trust? Examining three potential problems with the inequality-trust hypothesis. GINI Discussion Paper 20* (Vol. 20). Amsterdam.

Uslaner, E. M. (2002). The Moral Foundations of Trust. *SSRN Electronic Journal*.

Uslaner, E. M., & Brown, M. (2005). Inequality, trust, and civic engagement. *American Politics Research*, *33*(6), 868–894.

van Oorschot, W., & Arts, W. (2005). The social capital of European welfare states: The crowding out hypothesis revisited. *Journal of European Social Policy*, *15*(1), 5–26.

Zak, P. J., & Knack, S. (2001). Trust and growth. *The Economic Journal*, *111*, 295–321.