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Two types of trust

- A European study based on learnings from one of the most trusting countries in the

world

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ABSTRACT: The research field of trust has recently flourished as it has become a widely discussed topic within various academic arenas such as political science, history, psychology, management and economics. High trust levels stimulate trade through reduced transaction costs which fuels economic growth. Our research aims to connect two opposing theories regarding the construction of social trust to an economic perspective. Using a pooled cross-sectional dataset with seven rounds of the European Social Survey we apply one of the theories to examine if social trust and trust in public institutions are correlated. We further investigate if this correlation is stronger depending on which type of institution you examine, where research argues that the correlation to social trust should be stronger for operational institutions than for representative. We obtain highly significant results that support the first hypothesis but not the second one. It thus indicates that there exists a positive relationship between these two types of trust, but it does not signify that it should be stronger for the operational institutions than for the representative. These findings are important in an economic perspective as social trust has been described as the main ingredient to a successful economy, thus finding factors that may have an impact is necessary for maintaining and reinforcing the level of social trust in society.

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1. Introduction

Trust has historically been a key factor to economic success which has improved living standards and developed the size of the welfare state for countries all over the world. From the beginning of modern time social trust has been essential for creating security in transactions and can be seen as a substitute for the need to verify a counterparty's actions, and therefore induce productivity (Zak and Knack, 2001; Algan and Cahuc, 2010). The importance of social trust for the economy is evident in developing countries where you can see that trust induces trade and facilitates contracting, which fuels investments and creates economic growth (Knack and Keefer, 1997). High trust levels can also be connected to the quality of institutions (Robbins, 2011) and social trust is a key indicator of a well-functioning society. We therefore ask ourselves how this desirable social trust correlates to trust in public institutions, and further if the correlation is stronger depending on the characteristics of the institution.

Trusting populations are often characterised by stability and influence how we shape the society. The population's trust levels will affect what type of fiscal policies and what social investments the state needs to focus on. Trust levels are directly connected to political decisions through for example taxes and welfare systems, which aims to optimise utility for the society with a long term perspective. To trust is therefore described as to think longer-term, and low trust levels fosters short-termism which is argued to be inefficient and often utility destroying (Gyorffy, 2013).

Trust can further be split into different categories where we are interested in the relationship between social trust and trust to public institutions. Before there existed any formal states, social trust was fundamental for the development of stronger societies. With the economical and societal prosperity of the world, institutions and authorities have become extensively important for the quality of life (North, 1991). With this in mind, both social and institutional trust are important for society as it represent the stability of the population and also the country. We define social trust according to Bergh and Bjørnskov (2014) as; social trust is the expectation of cooperation between individuals, or more simply the trust you have to your next door neighbour. In some research, the term social capital is used which however is a slightly different concept defined as "networks together with shared norms, values and understandings that facilitate cooperation within or among groups", according to OECD Insights (2016). The distinction is that social capital is something that yields trust, and not the trust itself. To get a clear structure in the following research we will throughout use the term social trust. Further definitions necessary with regards to social trust is the distinction of generalised and particularised trust. Particularised trust arises in interactions where the persons get information about each other from face-to-face situations, it is often used to describe the trust you have to your family and close friends. Generalised trust on the other hand captures the trust you have towards a stranger who you lack any information about, i.e. your trust to other people in your society (Bjørnskov, 2006). This research will focus on generalised trust, however as will be noted, these two types are not always separable.

From the research of Bo Rothstein (2015) we define institutional trust as the expectation that the institution will use resources in the best interest of the population, following ethical and legal restrictions. Trust in institutions can therefore be seen as a very subjective and individual measurement of perceived quality. Compared to generalised social trust, institutional trust thus requires another dimension by adding ethics to the equation.

There is no doubt that it has been beneficial for countries who have succeeded in creating high trusting societies. An example of this is Sweden, a country that Rothstein, one of the most renowned names in this field of research, has observed closely. Sweden and also larger parts of Scandinavia have been able to build strong economies with low corruption and large welfare states. Speaking in terms of trust, Sweden is defined a high-trust society where the citizens have a large amount of trust in both each other, the state and in other public authorities (Trägårdh et al., 2013).



2.1 Table showing average levels of social trust in Sweden compared to other countries (ESS, 2016)

The general positive attitude in Sweden towards the state and its institutions is rooted several centuries ago, more specific during the 13th century, when the foundation of the modern society was built (Trägårdh et al., 2013). Rothstein acknowledges the high trust levels as a cornerstone for Swedish prosperity, and explains why this is fundamental for society. As the table above shows, Sweden has for many years been considered one of the world's most trusting countries, and is constantly placed at the top of rankings both regarding social trust and trust to institutions. The welfare system is among the most stable in Europe and safety nets together with free education and healthcare make Sweden an extraordinary example that is often referred to as close to the ideal society (Trägårdh et al., 2013).

The Swedish historical background and characteristics of society are very unique. Subsequently we wonder if this salient society also has influenced the theories presented by Rothstein as much of his work is focused on Sweden. Rothstein has created a theory about the foundation of social trust which opposes the American political science professor Robert Putnam, who with his research reinvented the idea about social capital in his ground breaking article Bowling Alone: America's Declining Social Capital (1995). In this thesis, we will therefore take Rothstein's theory, but broaden the spectrum to see if Sweden – as as one of the most trusting countries – really is a special case or not. We wish to see if his theory about the relationship of social trust and institutional trust is limited to Sweden, or applicable to other European countries which do not share the same historical background and culture as Sweden.

The remainder of the thesis will start off with a description of the previous research done in this field and the relevant theories. Section 3 continues with a presentation of our hypotheses and research question, followed by Section 4 where we present our data and choice of empirical method. Our results are presented in Section 5, in Section 6 we analyse these results and in Section 7 we present our concluding remarks.

2. Previous research

2.1 What creates trust in society - the two opposing theories

In the field of research of social and institutional trust, and how these two types of trust are related, there exists two different views both which are derived from political science. The first view is described by the American researcher Robert Putnam, who became famous for his theories about social capital and the causality of trust. His great contribution came with the article *Bowling Alone: America's Declining Social Capital* in 1995 (which was later expanded into a book). The article claims that the American social capital is declining and is today one of the most cited articles in this research area. He emphasises the importance of the civic society and the engagement in non-profit organisations such as being involved in religious groups, the Red Cross or the scouts for increasing the citizens' social capital and trust levels that in turn benefits society. In the article, he uses the bowling alley as an example demonstrating that people in the United States are becoming more individualistic and less socially active. He says that Americans nowadays more often go bowling alone rather than engaging in a team or league. This resulting in less social interaction, which in turn leads to a decline in trust (Putnam, 1995).

He also claims that it is the inherited tradition of how you build social networks that impacts how social trust is established and refers to the state and its different authorities as something as necessary evil rather than a condition for social trust. According to Putnam (in Trägårdh, 2013), the large democracy depends on the small. Engagement in the civic society and organisations fuels political engagement, which gives faith in politics and society (Trägårdh, 2013). Putnam's theory is sometimes referred to as the voluntary organisation theory, which Delhey and Newton (2003) cite in their research and emphasise the importance of participation in social activities. They describe it as by engaging with others on a voluntary basis we get an understanding of the common interest and learn the foundation about trust, reciprocity, cooperation and empathy from the local community.

The opposing theory about social trust is grounded in Swedish research made by Bo Rothstein and his colleagues at the University of Gothenburg. They pinpoint that it is the robustness of the state and its institutions that foster the otherwise fragile social trust. In this view, the ability to have trust in other people is only possible if we have high trust in the state and public institutions. Rothstein claims that one of the problems with low social trust among individuals' origins from institutions that either are dysfunctional, or are perceived to be so, or that have been acting in a discriminating way towards this group of people (Rothstein, 2003). This theory is called the *corruption-trust theory* and is described further below and more in detail in the appendix.

Another fascinating aspect in Rothstein's research that we will also examine further, is the distinction he makes between representative, investigating and operational institutions. As representative institutions he refers to politicians and the parliament, for the investigating he mentions the media and for the operational the police, the legal system, the military and the health care system. He further connects this distinction to the theory about the linkage of social trust and trust in institutions. In his analysis based on the Swedish survey Riks-SOM from the years 1996-2000, he concludes that the operational institutions, and specifically the legal system, has a stronger and more significant correlation with social trust than either of the representational and investigating institutions. This he says is supported by the fact that the trust for Swedish politicians and the parliament have previously declined without seeing an effect on the level of social trust, thus people's social trust remain stable even though the trust levels for the elected politicians has declined (Rothstein, 2003). With these results in mind, we will test this theory on more recent and extensive dataset, that the operational institutions are more correlated with social trust than what the representative institutions are, thus it is the scope of our second hypothesis.



2.2 Table showing differences in average levels of social trust and trust to public institutions (ESS, 2016)

2.2 The importance of trust

Social trust has traditionally been closely connected to economic success and development through reduced transaction costs, as each trade and transaction does not need to be verified anymore (Zak and Knack, 2001). As described by several economists, trust facilitates cooperation in groups and is essential to a society as it is leads to efficiency gains and productivity (Ostrom, 2000). The basic gains from social trust can be described in simple game theoretic terms as a standard prisoner's dilemma. Two players can either reach a risk optimal or a pareto optimal equilibrium dependent on the level of trust they have for one another. By cooperating and trusting each other the players can reach the pareto-optimal equilibrium and maximise their utility, which is what happens in a stable and high trusting society according to Mancur Olson (1996).

Clearly, trust is very important for society, and high trusting societies are according to Bergh and Bjørnskov also better at sustaining larger welfare states, as people who have more trust in the society's institutions are also more willing to contribute with resources (Bergh and Bjørnskov, 2014; Ostrom, 2000). As the state is dependent on citizens' contribution through legitimate behaviour, labour and taxes etc. public authorities are also forced to use the resources in an appropriate way to maintain this cooperative behaviour and the level of trust for the institution. La Porta and his colleagues also point out other economic perspectives to why social trust is important, namely that it is associated with low inflation, educational achievement and infrastructure quality (La Porta et al., 1997). However, it is important to remember that high trust levels do not automatically imply a strong economy or a large welfare state, but it is an indication that historically has been very accurate. It is neither the only variable affecting cooperation, or economic growth looking at the long-term perspective, but is clearly a contributing factor.

The importance of trust can also be seen in another perspective, namely what can happen if it is damaged and sometimes forever lost. As cited by Rothstein, the trust in a public authority is somewhat different from the trust we have in other people as we add the dimension of ethical behaviour. One could believe that people evaluate their trust for an institution through the perspective as a representative or an agent for us, but the level of trust is instead built on the perception of how well the institution acts according to ethical and legal restrictions. This means that authorities must act in an objective, unbiased and justified way to not lose trust and possibly enter the so called "social trap" (Rothstein, 2003). Again, we can describe this with game theory. In a welfare state everyone in the society wins if all members choose to cooperate with each

other - they reach the utility maximising equilibrium. Say that everyone pays taxes and gets the benefit of free education. If an individual is mistrusting towards the others and believes that the others will not cooperate, this individual will lose the incentive to continue to collaborate. Meaning that this person will stop paying taxes and still expect the benefit of the free education. The rational behaviour in this situation is thus to stop cooperation which will make everyone in the society worse off, and the mistrust will spread throughout society - i.e. we have entered the social trap. Researchers argue that once you are in a social trap it is extremely hard to disentangle from. It would require that people who historically mistrusted each other simultaneously change their mind, which often is dependent on a legion of other variables. For an institution or an organisation, getting into one of these traps can be particularly devastating as the state is dependent on obtaining trust and legitimacy from the public to sustain cooperation and enable accumulation of resources through for example taxes. Also if the trust for an institution is once damaged it is extremely challenging to repair, since it involves a vast amount of actors and cooperators (Rothstein, 2003). Instead of being just a two-player game as simplified by gametheory, this can be seen as an institution playing a multi-million player game with an entire population.

2.3 Generators of trust

Some of the most widely discussed influencers of social trust are the impact of parents, family culture and the upbringing. It is argued that the first years of the childhood are the most important for the formation process of personal values and trust. During these years the communication between parents and children in regards to how society works and if people can be trusted or not is presumed to have a substantial impact on the child's level of social trust (Stolle and Nishikawa, 2011). This inter-generational trust transmission from parents to children is further discussed by Algan and Cahuc (2010) by examining inherited trust levels of US immigrants. They show that the second generation immigrants are significantly influenced by their parents' country of origin and strengthens the theory that parents and family culture correlates with the level of social trust. Moreover, Eric Uslaner's (2002) research also emphasises how parents affect their children's level of social trust. He further shed some critique towards Putnam and his theory about the importance of the civic society and argues that when we are old enough to participate in civic activities our moral foundation of trust (his definition of social trust) is already formed. He also claims that when we engage in such events we mainly do so together with people that are similar to oneself. Thus it is not our generalised trust that is reinforced in such setting, rather it is the particularised (Uslaner, 2002).

Research further shows that after the first years of childhood where the socialising process has been confined to the family, the education system as a social setting takes over as the strongest influencer on a person's level of social trust. Just like Putnam's voluntary organisation theory only at an earlier stage in life, the first interactions in school is known to widen a person's social perspective, thus yielding knowledge about others and to create relationships between individuals. It gives us social intelligence that helps us to disentangle information of who is trustworthy and who is not (Trägårdh et al., 2013).

Education as a value in its own is also mentioned to be prepossessing social trust by the two researchers Zak and Knack. They claim that the education level increases social trust in three ways: by strengthening public institutions, reducing inequalities and also a direct effect from the increasing knowledge (Zak and Knack, 2001).

Putnam (2000) supports the theory about the importance of education for social trust and also claims that religion plays a vital role in this matter. He argues that there is a positive correlation between social trust and religion. This is however questioned by Andreas Bergh and Christian Bjørnskov (2011) who instead claim that there is in general a slightly negative relationship between religion and social trust. We will not look further into how this causal relationship works, but we will use religion as a control variable in our extended regression.

2.4 The assassins of trust

Trägårdh and his colleagues (2013) show by using Swedish micro data from Tillitsbarometern that there exists a negative correlation between perceived unfair treatment from both people and institutions with the general social trust. Another factor that is described as a major component for trust in institutions, that in turn has an effect on social trust, is the level of corruption. To see the causal relationship between corruption and trust in institutions and social trust is however difficult with only survey data. Rothstein makes an attempt to disentangle the causality with his corruption-trust theory and thus argues that people form their perception about the trustworthiness of others from information about how public officials act, as they represent the society. He also adds that people often couple this with their own level of trustworthiness, and refers to the saying *to know oneself is to know others*. In this view, the perceived behaviour of public officials and the signals they send of how the community works, are crucial for building a high-trust society (Rothstein, 2003).

To test his corruption-trust theory (see appendix), Rothstein and his colleague Daniel Eek have used an experimental approach. They performed a test using Swedish and Romanian students to see if and how these two groups of people with similar characteristics in regards to age and education but different origin, deviate in their beliefs and values when they are exposed to identical situations where a public authority is corrupt. As mentioned earlier, Sweden is known for being a high-trust and low-corruption country, and Romania quite the opposite as a lowtrust, high-corruption country, so the difference in history and culture is great. From this test they could draw two main conclusions. The first finds that even though people are brought up in a high corrupt community does not mean that they morally accept the behaviour of corrupt public officials. The second finding, that is most interesting from our point of view and that supports his corruption-trust theory, display that the students that were exposed to a corrupt public official did not only lose their trust in that authority, but also believed that people in general were less trustworthy, which occurred regardless of the student's origin (Rothstein and Eek, 2009).

The corruption-trust theory is very interesting in these aspects however there is always limitations to experimental approaches as they are performed under unnatural circumstances. Also the sample of participants is quite small and limited to a specific group. This makes it difficult to draw reliable conclusions applicable to broader populations. One could also question Rothstein's attempt to establish the causality with this theory with regards to the simplicity, which must be said is both admirable and questionable. For instance, the model assumes that corruption among public officials is known. Corruption is often something that exists in the dark, and also is denied if made public. If made public, it is often done through media, a party that the model does not take in account but is highly influential on people's opinions.

Experimental approaches in the research field of trust is more uncommon than econometric approaches using surveys. To measure social trust, the question most commonly used is "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?" (ESS, 2016). This formulation is from the European Social Survey and the history of using this type of formulation goes all the way back to late 1950s (Bjørnskov, 2006). However, the formulation of the question is criticised by many economists. Glaeser et al. (2000) write:

"The great lacuna in this research agenda is the measurement of trust. [...] While these survey questions are interesting, they are also vague, abstract, and hard to interpret" (pp. 811).

Bjørnskov (2006) adds:

"When asking this question, it is nonetheless not made clear to respondents whom to trust, in which situations or under which circumstances. This ambiguity could make it rather difficult for people to answer the question, implying that it might pick up culturally specific perceptions of the context in which it is asked [...]" (pp. 2).

The difficulties with showing true causality from survey data stands against the often small sample size used in experiments. The best way according to most economists is therefore to use a combination of the methods to examine the same question (Berggren and Jordahl, 2006).

2.5 Other influencers

We have until now mentioned education, parenting, religion, engagement in voluntary organisations and corruption as factors that influence a person's level of social trust. However, the research in this field is extensive and mentions a variety of factors as important, some we will try to incorporate in our extended regression model and see if they give value to our hypotheses. Variables discussed are for example: gender, age, income, employment status, social class and political ideology. Another element that has been mentioned as influential in this context is perceived safety. Delhey and Newton (2003) even conclude that this variable is one that is most correlated with social trust, as both trust and safety is strongly connected to the individual perception of other people.

As we have already mentioned, first and second generation US immigrants have been studied to establish the the effect of inherited trust levels by Algan and Cahuc (2010). With the current refugee crisis, the topic of immigration has become increasingly periphrastic, and for social trust the status of immigration is known to have an impact. As Rödher and Mühlau (2012) show, the people who are born outside of the country usually have higher levels of both social and institutional trust. They argue that it is the lower expectations from poorer institutional performance in their country of birth that raises the trust levels for immigrants, even though one might question the authors highly generalised conclusion that all immigrants come from countries with lower institutional performance.

With this said, there is also researchers who argue that trust is not necessary always a good thing for society as it also brings risk and accommodates naivety. Berggren and Jordahl (2006) highlights the difference between trust and trustworthiness which is sometimes inaccurately generalised as the same. An actor who has high trust in others is not always trustworthy, and neither the reverse. Having a critical eye and a bit of distrust protects us from being naive and credulous which also is beneficial to society (Hardin, 1999).

3. Research question

As we now know why high trust levels are desirable, we continue to examine how social trust correlates to trust levels in different public institutions. Our research question stems from Rothstein's theory, that we can only have trust in each other if we have trust in our institutions, as we apply this theory to a larger and more recent dataset. This first hypothesis Rothstein himself tested using the 1995-1997 World Value survey, and Swedish micro data. As the work of Rothstein emerges in the opposing light of Putnam, we will test if Rothstein's theory holds, or if one should emphasise Putnam's ideas.

Further with the same scope, we are interested in if Rothstein's other idea that the trust in the operational institutions has a stronger positive correlation with social trust then the representative institutions. This second hypothesis he has to the best of our knowledge only tested on Swedish data. The aim is to see if Sweden is a special case or if the same conclusions are to be drawn when we broaden our scope to Europe using the 1st to 7th wave of the European Social Survey, thus when analysing countries who have built their welfare system and institutions on different grounds than Sweden.

We define operational institutions as non-elected public institutions and will test the police and legal system as proxies for these. For representational institutions we use politicians and the country's parliament. However, some research claims that it is highly unlikely to see a difference in the opinions about the representative institutions as they are so closely related that people do not distinguish between them (Hooghe, 2011). We will not go into this statement further as our choice to test two authorities for each type of institution is basically due to the objective to see if there exist any individual differences.

Hypothesis 1: Trust in public institutions has a positive correlation with social trust.

Hence we test the null hypothesis:

$$H_0: \beta_{police} = 0, \beta_{legal \ system} = 0, \beta_{politicians} = 0, \beta_{parliament} = 0$$

 $H_1: \beta_{police} \neq 0 \text{ and/or } \beta_{legal \ system} \neq 0 \text{ and/or } \beta_{politicians} \neq 0 \text{ and/or } \beta_{parliament} \neq 0$

Our null hypothesis thus constitutes of four exclusive restrictions, turning it into a joint hypotheses test. If we can reject the null hypothesis at a significant level, this will be consistent with Rothstein's theory. We will test it using regression Model 2 and 3.

Hypothesis 2: Social trust and the trust in operational institutions are more positively correlated than social trust and trust in representative institutions.

To test this, we split the hypothesis in four parts with their respective null hypothesis. We test these four questions separately on regression Model 2 and 3 to be able to indicated whether our Hypothesis 2 is true or not.

Hypothesis 2.1: Social trust and trust in the police is more positively correlated than social trust and trust in politicians.

$$H_{0,1}: \beta_{police} \le \beta_{politicians} \qquad \qquad H_{1,1}: \beta_{police} > \beta_{politicians}$$

Hypothesis 2.2: Social trust and trust in the police is more positively correlated than social trust and trust in the country's parliament.

$$H_{0,2}: \beta_{police} \le \beta_{parliament} \qquad \qquad H_{1,2}: \beta_{police} > \beta_{parliament}$$

Hypothesis 2.3: Social trust and trust in the legal system is more positively correlated than social trust and trust in politicians.

$$H_{0,3}: \beta_{legal \ system} \le \beta_{politicians} \qquad \qquad H_{1,3}: \beta_{legal \ system} > \beta_{politicians}$$

Hypothesis 2.1: Social trust and trust in the legal system is more positively correlated than social trust and trust in the country's parliament.

$$H_{0,4}: \beta_{legal \ system} \leq \beta_{parliament} \qquad \qquad H_{1,4}: \beta_{legal \ system} > \beta_{parliament}$$

If accepting all four part hypotheses, that is rejecting the null hypotheses, our results would be consistent with Rothstein's theory and indicate that Hypothesis 2 is true.

4. Empirical method

4.1 Choice of econometric approach

In our research we are using a pooled cross-sectional sample with data from the 1st to the 7th round of the European Social Survey where the data is collected between years 2001-2014. A pooled cross-section sample draws random samples at different points in time but from the same population, just like the European Social Survey. The multi-round analysis gives us a sample size of a total of 315 573 observations, which compared to Rothstein who used around 56 000 observations is a substantial increase that improves the possibility of getting significant results. Increasing the power to the sample and thus getting more precise test statistics is one of the main advantages of using pooled cross-sections samples (Wooldridge, 2006).

A pooled cross-sectional OLS model takes the following form:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \dots + \beta_n X_{it} + v_{it}$$

Where $v_{it} = a_i + u_{it}$

Thus the composite error term consist of a fixed effect a_i , that includes factors that are constant over time, but vary across countries. And an idiosyncratic error u_{it} that includes factors that vary over time within the countries, as temporarily shocks that have an impact on social trust, such as a for example a terrorist attack.

Using pooled OLS has some limitations and disadvantages. One of these being that the model does not take in account the time-invariant country specific fixed effects a_i , which can result in biased coefficients. For them to be unbiased, we need the following condition to hold:

 $Cov(X_{it}, a_i + u_{it}) = 0$ for all independent variables, which is highly unlikely.

To enable us to fulfil the above condition and avoid biased estimated coefficients, we will include dummy variables representing each country. To account for a possible presence of a time trend we also include dummy variables for each round of the ESS. The dummy variables used in our regression models will be described more in detail further below. When testing our first hypothesis we will perform a F-test to test for joint statistic significance for our four institutional trust variables. This will show if the explanatory variables have estimated coefficients equal to zero, or if they are consistent with our Hypothesis 1 meaning that at least one of them are statistically correlated with our dependent variable, social trust.

For our second hypothesis we first test for the inequality of the coefficients with a F-test for each null hypothesis. We can then use the result and calculate the p-value as for a one sided t-test and thus indicate if our hypotheses are true or not.

4.2 Data description

The European Social Survey project started in 2001 and is conducted across Europe every second year through one hour face-to-face interviews with the respondents. The objective of ESS is to measure attitudes, beliefs and behaviour patterns of the populations in Europe. The data is collected from a random sample of individuals over 15 years old, but regardless of nationality, citizenship, language or legal status. The survey is cross-national and uses respondent data from different countries every year, which gives us a sample pool from 32 countries in total when pooling the rounds (ESS, 2016). This large and diverse dataset we believe is very good for testing our hypotheses, as it contains similar survey questions and variables to what was used in Rothstein's research when he structured his theory. For further detail of the data, see appendix.

Weights

Using the ESS survey in a multi-round analysis where we combine both data from multiple rounds and multiple countries, we have to account for varying design and populations weights to avoid measurement errors and potential sample bias.

By using both design and population weights we address the issue of potential selection bias and unequal population sizes. Both weights are calculated by ESS researchers where the purpose of design weights are to correct for the unequal probability of inclusion in the sample that exists in some countries due to the sampling design. It is also possible to use post-stratification weights as an alternative for this issue, but as the stratification weights have not yet been published for the 7th round (2014), we chose to use the design weights to get a coherent handling of the data. Thus, we incorporate *DWEIGHT* in all of our regressions.

The population weight is added to account for the different countries who have an unproportional amount of observations in the sample to its population size. This could potentially create biased estimates as smaller countries would be over-represented in the sample when comparing countries (ESS, 2016). The weight adjusts the data accordingly:

PWEIGHT = (Population size aged over 15 years and above ÷ Net sample size in country)×10 000

The weights are then combined as $wgt = PWEIGHT \times DWEIGHT$ to be able to adjust for both weighting criteria in the same regression and dataset.

Potential bias and critique

As mentioned in the previous research section, this type of survey method can be questioned due to ambiguity in the questions asked to the respondents. As the questions are sometimes very vague, it leaves room for free interpretation. An example of this is the question for social trust which we use, that lacks clarification regarding generalised or particular social settings. To have in mind is also the different perceptions about the applied scale which many variables are reported by. This can lead to potential measurement errors due to the individual interpretation of for example what a four out of ten means for you, where there is also difficult to create a universal apprehension.

Another issue linked to the self-reporting data is the measurement error that can be created from respondents reporting false or exaggerated information during these face-to-face interviews where the data is collected. Self-serving bias is a typical problem as people have a tendency to present themselves in a favourable manner (Wooldridge, 2006). However, the European Social Survey is among the most trustworthy sources in this field, being widely used among researchers all over the world and also accredited European Research Infrastructure Consortium (ERIC) status in 2013 (ESS, 2016). We also argue that by pooling the multiple rounds of the survey and using appropriate weights, we have a sample that is large enough to cancel out these deviations. With this said, it is still good to continuously review results from these type of datasets with a critical eye.

One last critique of the reliability of the European Social Survey, and surveys in general, is to ask the question of *who answers the survey?*. There might be a bias that affects our case created by the fact that low trusting people could be more keen on ignoring the invitation to the survey because of their low trust. If so, the data will be skewed after more trusting participants. The opposite could also be stated, as low trusting individuals could be more keen on making an impact than people with high trust, and therefore more motivated to contribute. Critical individuals could be more willing to make a difference and express their disappointment. Yet once again, we argue that due to the large sample size, these two views will cancel out. Respondents are also "selected by strict random probability methods at every stage" (ESS Sampling Guidelines, 2014) and the method prohibits quota sampling for any country, which should reduce measurement error and potential bias to a minimum.

Controls and adjustments

When using this pooled cross-sectional data we will need two main controls to account for variations between years, and also for countries as mentioned in the introduction of this section. Country fixed effects will be used to control for time invariant effects as for example the historical impact from being an ex-communist country or political culture. This will be handled by creating dummy variables for each of the 32 countries. To control for country fixed effects is a systematic characteristic and according to Hooghes (2011) a strong explanatory variable for trust in representative institutions. This also follows Rothstein's research regarding for example corruption and trust levels. We also create dummy variables for the different ESS rounds to adjust for the fact that in a pooled cross-sectional sample the observations may have different distributions at different points in time. As the rounds are collected every other year we don't use the year, but the round number as the dummy variable to control for time effects, and chose the first round as the base year. This controls for the common time trends that prevail across all countries.

In addition to this, we will adjust the standard errors by clustering the sample by country.

This means that we allow the error term of observations for the same country to be correlated. Thereby we control for the fact that the standard errors are likely to be serially correlated over time. Clustering our sample gives us the most conservative standard errors and we avoid that the unobserved heterogeneity that is constant over time and correlated with independent variable, which can make our estimated coefficients biased, thus allowing for correct inference (Wooldridge, 2006).

4.3 Designing the regression models

We have chosen to run three different regression models to see if the results of the hypothesis testing change when we include different variables. The first regression is a replica of a test run

by Rothstein as described is his book "Sociala fällor och tillitens problem" (2003) where he derives the relationship between social trust and trust in the legal system. The second regression model is an extension of Rothstein's model where we add trust measures for the additional institutions, that is the police, the politicians and the parliament. The last regression that we will run is what we call our extended model. As model one and two builds on one of Rothstein's simpler models, we add extra explanatory variables to the extended version for increased accuracy and information about the population. We add variables both regarding demography and other variables which have been proved influential by other researchers.

4.3.1 Model 1: Rothstein's model of interest

Rothstein's regression model that we will use for testing the hypotheses is shown below. He tested this model using both Swedish data from Ipsos (previously called TEMO, includes 906 observations) as well as data from the World Values survey collected from the years 1995-1997 (includes 56 204 observations). He thus did two sorts of analyses, one only looking at Sweden and the other looking at the world as a whole. This is not the first time Rothstein derives the relationship between social and institutional trust, nor the last. However we chose this particular regression because of its simplicity which makes it easier for us to find more precise proxy variables in our dataset which enables us make relevant comparisons of the results. Also to our best knowledge, this regression is not tested on an as large or recent sample as we have, and not limited to Europe.

Dependent variable:	Social trust
Independent variables:	Trust in legal system
	Education
	Political interest
	Engagement in civic organisations
	Corruption
	Satisfaction with life
	General health
Other variables:	Dummy variables for each round of the ESS, round 1 as base year
	Dummy variables for each country, Sweden as base case Weight variables for design and population

4.1 Table showing regression variables in Model 1

Fortunately, the majority of these variables are to be directly found in the European Social Survey, but some we will have to choose a more inferior proxy for which we will describe more in detail further below.

4.3.2 Model 2: Extension of Rothstein's model, including all institutions of interest

The expansion made in this model from Rothstein's original is the addition of the trust variables for each of the institutions that we also would like to test: trust in the police, politicians and the country's parliament. With this model we seek to answer both our Hypothesis 1 and 2.

Dependent variable:	Social trust
Independent variables:	Trust in legal system
	Trust in the police
	Trust in politicians
	Trust in the country's parliament
	Education
	Political interest
	Engagement in civic organisations
	Corruption
	Satisfaction with life
	General health
Other variables:	Dummy variables for each round of the ESS, round 1 as base year
	Dummy variables for each country, Sweden as base case Weight variables for design and population

4.2 Table showing variables in Model 2

4.3.3 Model 3: Extended model

By adding relevant variables to Rothstein's model which we will explain and justify separately below, we are taking his very simple seven-variable model to further control for both demographic influences and other variables and then again test our Hypothesis 1 and 2.

Dependent variable:	Social trust
Independent variables:	Trust in legal system
	Trust in the police
	Trust in politicians
	Trust in the country's parliament
	Education
	Political interest
	Engagement in civic organisations
	Corruption
	Satisfaction with life
	General health
Extension:	Age
	Gender
	Immigrant
	Unemployed
	Public sector employee
	Perceived safety
	Religiousness
Other variables:	Dummy variables for each round of the ESS, round 1 as base year
	Dummy variables for each country, Sweden as base case
	Weight variables for design and population

4.3 Table showing variables in Model 3

4.4 Variable description

As you can see in the table below, some variables we have perfect proxies for to Rothstein's and we will therefore not go into detail about these in the section following the table.

Variable	Name	Description	Scale	Lowest value meaning	Highest value meaning
Social trust	ppltrst	Most people can be trusted or you can't be too careful	0-10	You can't be too careful	Most people can be trusted
Trust in the legal system	trstlgl	Trust in the legal system	0-10	No trust at all	Complete trust
Trust in the police	trstplc	Trust in the police	0-10	No trust at all	Complete trust
Trust in politicians	trstplt	Trust politicians	0-10	No trust at all	Complete trust
Trust in the country's parliament	trstprl	Trust in country's parliament	0-10	No trust at all	Complete trust
Highly educated	highedu	Dummy variable if more than 12 years of completed full time education	Dummy	No	Yes
Political interest	polintr	How interested in politics	1-4	Not interested at all	Very interested
Engagement in civic organisations	sclact	Take part in social activities compared to others of same age	1-5	Much less than most	Much more than most
Corruption	corruption	Corruption perception index	0-10	Very clean	Highly corrupt
Satisfaction with life	stflife	How satisfied with life as a whole	0-10	Extremely dissatisfied	Extremely satisfied
General health	health	Subjective general health	1-5	Very good	Very bad
Calculated age	agea	Age of respondent, calculated	15-123	N/A	N/A
Gender	female	Dummy variable if female	Dummy	No	Yes
Immigrant	immigrant	Dummy variable if immigrated to this country	Dummy	No	Yes
Unemployed	uempla	Dummy variable if main activity during last 7 days: unemployed, looking for job	Dummy	No	Yes
Public sector employee	pubemp	Dummy variable if type of organisation work for: central/local government or other public sector	Dummy	No	Yes
Religiousness	rlgdgr	How religious are you	0-10	Not at all religious	Very religious
Perceived safety	aesfdrk	Feeling of safety of walking alone in local area after dark	1-4	Very safe	Very unsafe

Education

As described by Zak and Knack (2001) in the previous research section and also mentioned by several other researchers, education levels often increase social trust levels and reduces other factors such as inequalities in society, that in turn is a variable that can impact trust (Bergh and Bjørnskov, 2014). To control for education is therefore important for our model. From the ESS we use the years of full-time education completed as a variable for this. In other research we have also seen different options as the "highest level of education successfully completed" but we have chosen to use the years of education instead due to the fact that education systems vary across Europe. The estimated relation that we are interested in is the implication of being highly educated, which we define with a dummy as having more or less than 12 years of full time schooling.

Corruption

For the variable *How common do you think it is with bribes and corruption in your country?* that Rothstein (2003) uses in his regression, we do not find any satisfactory proxy variable in the European Social Survey. Including this and controlling for corruption is though essential for our model and Rothstein's theory, which our hypotheses derives from. As we then cannot get any data about the individual apprehension about corruption from our respondents, we will use the Corruption Perception Index compiled by Transparency International. The index is based on expert opinion and measures the perceived corruption rates in public sectors per country on a scale of 0 (highly corrupt) to 100 (very clean) since 2012. Before 2012, the index was reported on a 0-10 scale which Transparency International then changed. We have therefore adjusted all values to the 0-10 scale for cohesiveness and easier interpretation. The index value has been added for each country as per round, as the index annually changes. We have also chosen to turn the index for simplicity reasons and a more logical interpretation, so that 10 equals a highly corrupt country and 0 equals a very clean country in our regressions.

Engagement in civic organisations

As described by the theory of Putnam, engagement in civic organisations are what he believes fosters social trust. To our understanding, Rothstein adds this variable to test Putnam's theory which shows as insignificant in his regression model. Some researchers argue that it is instead the everyday social activities with close family, friends and colleagues that has the largest impact in this aspect (Yamagishi and Yamagishi 1993). To test whether this factor has any explanatory value to our dataset, we will use the variable "*Take part in social activities compared to others of same*

age" as a proxy for this engagement. It is clearly not a perfect proxy but we believe that it is sufficient as it captures the social engagement in society, and is the best option offered as we have no possibility of following up on the sample population.

Control variables in our extended model

Age and Gender

Both age and gender are frequently included as demographic control variables in various regression models since they often have a significant impact on the independent variables coefficients' and tells us a lot about the population. Algan and Cahuc (2010) includes them in their model when running similar regressions on US data, and Oskarson and Rothstein (2012) show that different age groups have severely different levels of social trust. Age is reported by calculated age at the time of the interview, and gender is reported by a dummy variable which equals 1 if the respondent is female, and 0 otherwise.

Immigration

The difference between natives' and immigrants' levels of institutional trust is a very popular field of research at the moment. A study made by Rödher and Mühlau (2012) using the same dataset as us indicates that immigrants have higher levels of institutional trust. They argue that the reason for this is that immigrants have lower expectations since they are coming from countries with poorer institutional performance. Since our hypotheses is investigating the relationship between social trust and trust in public institutions we find immigration as a relevant variable to include in our extended model. We create a dummy variable which equals 1 if the respondent is not born in the country where the data is collected, and 0 otherwise.

Unemployment

The workplace is described by Trägårdh and his colleagues (2013) to be an important arena for social interaction and it supports the ability to form trusting relationships. Because of this theory, we add a variable that measures how the status as unemployed affects a person's level of trust. We create a dummy variable for the respondents who answered *Unemployed and actively looking for a job* to the question *Using this card, which of these descriptions applies to what you have been doing for the last 7 days*?

Public sector employee

When we test for the level of trust in different public institution, our intuition tells us that the type of employer might have an influence. If being employed in an organisation which is run by the authority which we test, we potentially could have an omitted variable bias for the people employed in the public sector. Rothstein together with Kumlin (2005) also include a dummy variable in one of their research papers which represents if the respondent is employed in the public sector or not. In their model, this is estimated as having a positive impact on a person's social trust, but it is not statistically significant. We add it into our extended model as a dummy variable to make sure that we do not have an omitted variable bias affecting the institutional trust levels.

Religiousness

As mentioned in previous research, there are two opposing theories of how religion affects social trust. Putnam claims that it increases a person's social trust, but Bergh and Bjørnskov (2011) argue for the opposite. We find this tension interesting and therefore add the level of religiousness as a variable in our extended model to see if and what impact it has on our results.

Perceived safety

In Delhey's and Newton's (2003) research, public and community safety appears as highly important variables for social trust. Our intuition also tells us that perceived safety could be strongly correlated with social and institutional trust, which also is described by the "crushed windows effect" by Trägårdh et al. (2013). We will use *Feeling of safety of walking alone in this area after dark* as a proxy for this perceived safety.

5. Results

Below we show the results from our three regression models. We display the F-statistics and p-values for our hypotheses which are tested on Model 2 and 3. The p-values from Hypothesis 2 are from the one sided t-test.

Name	Variable	Ν	Mean	St. deviation	Max	Min
Social trust	ppltrst	314311	4.9588	2.4842	10	0
Trust in legal system	trstlgl	306679	5.0434	2.7088	10	0
Trust in police	trstplc	311155	5.8317	2.6506	10	0
Trust in politicians	trstplt	308551	3.4967	2.3958	10	0
Trust in country's parliament	trstprl	306441	4.3674	2.6024	10	0
Highly educated	highedu	315573	0.4370	0.4960	1	0
Political interest	polintr	314493	2.6196	0.9074	4	1
Engagement in civic organisations	sclact	308637	1.7103	0.9478	10	0
Corruption	corruption	315573	3.3524	2.0171	7.9	0.3
Satisfaction with life	stflife	313842	6.8179	2.3457	10	0
General health	health	315134	2.2382	0.9358	5	1
Calculated age	agea	314309	47.6954	18.5354	123	5
Gender	female	315573	0.5385	0.4982	1	0
Immigrant	immigrant	315573	0.0902	0.2865	1	0
Unemployed	uempla	315573	0.0446	0.2637	1	0
Public sector employee	pubemp	315573	0.1159	0.3201	1	0
Religiousness	rlgdgr	312858	4.7494	2.9987	10	0
Perceived safety	aesfdrk	311953	2.0422	0.8102	4	1

5.1 Table showing summary statistics

5.2 Table showing the results from the hypothesis testing using Model 2 and 3 (ESS, 2016)

	Model 2		Mode	13	
	F-statistic	P-value	F-statistic	P-value	
Hypothesis 1:				·	
$H_0:\beta_{police}=0,\beta_{legalsystem}=0,$	7.08	0.0009	9.18	0.0002	
$eta_{politicians}=0$, $eta_{parliament}=0$	1.00	0.0000	<i>y</i> .10	0.0002	
Hypothesis 2:					
$H_{0,1}:\beta_{police} \leq \beta_{politicians}$		0.99969665		0.99988928	
$H_{0,2}:\beta_{police} \leq \beta_{parliament}$		0.99947876		0.99987927	
$H_{0,3}:\beta_{legal\ system} \leq \beta_{politicians}$		0.98496503		0.98880694	
$H_{0,4}$: $\beta_{legal \ system} \leq \beta_{parliament}$		0.8132526		0.84357538	

5.1 Model 1

With the replica of Rothstein's model (as described in section 4.3.1) we examine the correlation of trust in the legal system and social trust using a pooled OLS model. The model includes numerous control variables and dummy variables and we end up with a sample of 297 691 observations and a R-square value of 0.179. To get correct standard errors we cluster the sample by country. We will display the coefficients and significance levels for the independent variables for all three models below, but will present the results of the independent variables of interest separately and the results from the other control variables in the end of section 5.3.

	(1)	(2)	(3)
VARIABLES	ppltrst	ppltrst	ppltrst
trstlgl	0.178***	0.0709***	0.0679***
-	(0.00953)	(0.00638)	(0.00663)
trstplc		0.0387***	0.0354***
-		(0.00663)	(0.00599)
trstplt		0.0973***	0.0969***
		(0.0122)	(0.0122)
trstprl		0.0786***	0.0769***
		(0.00790)	(0.00764)
highedu	0.292***	0.308***	0.301***
	(0.0414)	(0.0405)	(0.0321)
polintr	-0.168***	-0.111***	-0.0945***
	(0.0257)	(0.0234)	(0.0201)
sclact	0.149***	0.143***	0.136***
	(0.0193)	(0.0179)	(0.0171)
corruption	0.0248	0.0414	0.0416
	(0.0459)	(0.0485)	(0.0505)
stflife	0.137***	0.116***	0.108***
	(0.00429)	(0.00457)	(0.00436)
health	-0.111***	-0.110***	-0.0943***
	(0.0192)	(0.0178)	(0.0130)
agea			0.00175
			(0.00133)
female			0.0946***
			(0.0187)
immigrant			-0.112**
			(0.0471)
uempla			-0.0631*
			(0.0317)
pubemp			0.110***
			(0.0291)
rlgdgr			0.00368
			(0.00660)
aesfdrk			-0.274***
			(0.0329)
Constant	3.945***	3.401***	3.835***
	(0.112)	(0.0889)	(0.114)
Observations	297,691	290,314	285,189
R-squared	0.179	0.197	0.206

5.3 Table showing the regression output from Model 1, 2 and 3

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Dummy variables for ESS rounds and countries hidden. For full regression table see appendix.

Estimated effect of trust in legal system

The results show that a person's level of trust in the legal system has a predicted positive impact on social trust at a high significance level (p<0.01). This means that if a person experiences a one-point increase in their trust in the country's legal system, their level of social trust is implied to increase by 0.178 points. This positive correlation was intuitively expected, and also in line with Rothstein's original research.

5.2 Model 2

When running our second model to our dataset, we add the independent variables as described in section 4.3.2. This enables us to test our Hypotheses 1 and 2.

When adding the other three institutional trust variables, our sample is reduced to 290 314 observations and we get a R-square value of 0.197. We have just like in the first regression chosen to cluster the standard errors by country. The regression table, excluding our dummy variables for countries and years, is shown in section 5.1.

Hypothesis testing

The results from our second model show that all our independent variables for trust in public institutions have a positive estimated correlation with social trust at a high significance level (p<0.01). When we conducted the F-test to test our first hypothesis for joint significance we were able to reject our null hypothesis as we get an F-statistic of 7.08 at a 1% significance level. We thus reject that trust in public institutions has a non-existing correlation with social trust. These results are consistent with the theory of Rothstein.

For our second hypothesis, we look at the estimated coefficients for the public institutions and see that trust in the politicians has the largest correlation coefficient $\beta_{politicians} = 0.0973$, followed by trust in the country's parliament $\beta_{parliament} = 0.0786$, third comes trust in the legal system $\beta_{legal \ system} = 0.0709$ and at last the trust in the police $\beta_{police} = 0.0387$. As we can see all these are statistically significant from zero, we directly perform a F-test to also test for the inequality of the coefficients. Following this, we do a one sided t-test and the p-values for this is displayed above. In light of these results, we fail to reject any of the null hypotheses at any secure significance level. We thus can conclude that the second hypothesis is not true for our sample. All four cases of our hypothesis testing indicate that the estimated coefficient for

operational institutions are not larger than the representative ones, and these results are opposing the research made by Rothstein only using Swedish data.

5.3 Model 3

In our extended model, we have added extra control variables that have prevailed in other research and that we think may have explanatory value. As we were not able to reject any of the null hypotheses for our second hypothesis with Model 2, we aspire to see if adding these other control variables have an impact on our hypothesis testing. When including these variables, we get a sample of 285 189 observations and a R-square value of 0.206.

Hypothesis testing

The estimated coefficients for our public institutions changes only slightly in our extended model and we have the same results as in Model 2 regarding our hypotheses. For the first hypothesis we perform a F-test to test for joint significance and get a F-statistic of 9.18, meaning that we can reject the null hypothesis at a 1% significance level. Thus we reject that our estimated coefficients are jointly equal to zero.

For the second hypothesis we perform the same test as for Model 2 and we once again fail to reject any of the null hypotheses at any secure level of significance. The results from this hypothesis testing from Model 3 gives even stronger indications that our second hypothesis is not true.

Estimated effect of control variables

In the first two models we obtain statistically significant results for all control variables, except for our corruption variable, at a 1% significance level. Looking at the variable *highedu*, our dummy variable representing if the respondent has continued on to higher education or not, we see that it has a coefficient ranging from 0.292 to 0.308. This shows that being highly educated has a predicted positive impact on a person's level of social trust which is in line with the research presented by Zak and Knack (2001).

The variables *stlife*, *health*, *scalct* have all estimated values that does not notably change between the three models. They all have the intuitively expected impact on social trust, namely; the happier you are, the better perceived general health that you have and the more socially active you are, the higher will your level of social trust on average be.

Estimated effect of corruption and country dummies

As we can see from the regression table for all the three models, the estimated coefficient for corruption shows a slightly positive relation with social trust. This is very unexpected and not in line with either our intuition or Rothstein's corruption-trust theory. However, the corruption variable is not significant in either model and the results can probably be explained by the fact that we also add dummy variables to account for country fixed effects. The dummy variables account for the within variation and removes the between variation from each country, leaving less variation to be explained by the corruption variable. We can also see this from running a regression of corruption against all the country variables which gives a R-square value of 0,96, meaning that close to all variation in the corruption variable is explained by the country dummies already. This gives the corruption variable less explanatory value in our regressions, thus one option could have been to remove this variable completely. Still we chose to keep it as we want to follow Rothstein's model as closely as we can even if the results show that it is expendable.

Estimated effect of interest in politics

The change in estimated impact from the respondent's level of political interest from Model 1 to 2 and 3 is relatively large as the size of the coefficient decreases with about 35%. As we add more variables to the regressions we get a smaller correlation from this variable, and the estimated coefficient converges to zero. The coefficient is however negative through all models, which is contrary to Rothstein's original model.

Estimated effect of demographic variables

The demographic variables that we added in our extended model, such as *gender, age, unemployment* and the status as *immigrant* all give expected results, except from the immigration variable. This variable indicates that the status as not born in the country affects your social trust negatively, which is the opposite from what we have encountered in previous research. The unemployed status also has a predicted negative relation with social trust, which we though anticipated.

The gender and age variables implies that females on average have greater social trust than men, and the older you are, the more trusting you are generally towards others. These estimated coefficients are as expected from previous research.

Looking at the result for the four additional variables that we included in the extended model: *public employment, feeling of safety walking alone in the dark* and *religiousness* we obtain significant results for the first two but not for the level of religiousness. The impact from being highly religious is

very small in this regression, however it has a predicted positive impact on social trust as according to Putnam (2000). Religion and public employment reports positive estimated coefficients, as expected. Perceived safety has a strongly negative correlation that is also in line with the research by Delhey and Newton (2003), but however we did not anticipate that it would be so strongly correlated with our dependent variable.

6. Discussion

With our hypothesis testing in mind we can summarise our sample's results:

- 1. Trust in all our examined public institutions has a positive correlation with social trust.
- 2. The relation between trust in operational institutions and social trust is not estimated as stronger than the relation for trust in representative institutions and social trust.

In the following discussion we will analyse these results and connect them to the theories presented in the previous research section.

6.1 Findings

With our empirical analysis we can successfully reject our first null hypothesis, this meaning that Rothstein's theory about the existence of a correlation between trust in public institutions and social trust is supported by our expansive dataset, given that we control for various factors. However, this analysis only supports the theory that there is a correlation between these variables, as it is important to acknowledge that it does not show the causal mechanism behind this interconnection. This means that we cannot determine the actual cause and effect, as we can only see that a person with high trust in these public institutions will also generally be more trusting towards other people. One can also think that people who have more trust towards others, also have an ability to be more trusting towards public institutions, as we cannot determine if the trust in these public institutions actually generates social trust or if it is the other way around. This means that we could have a two-way relationship as they are so closely intertwined.

When testing our second hypothesis we get intriguing outcomes, outcomes that we did not expected beforehand. We did not anticipate that we would not be able to reject our four null hypotheses, as we believed that there would be a stronger positive correlation between the operational institutions and social trust then the correlation between social trust and the representative ones - as stated by Rothstein. To our best knowledge, Rothstein has only tested this theory using Swedish data and has not confirmed it on an international population sample, which can indicate that Sweden is a special case in this perspective. As we were not able to reject any of the null hypotheses using our regression models, we can draw the conclusion that the theory does not hold for our dataset with our control variables. With this said, we must highlight the fact that we do not have the exact same variables to control for as Rothstein when he conducted this test. Our results could be affected by the different design and formulations in the survey data, and also by the proxies we have been forced to use.

We further wonder how these results can be explained. Why is the trust in the operational institutions less correlated with social trust than the representative ones in our dataset? One explanation could be due to diminishing marginal effect of increasing trust levels. As seen in graph 2.2 the average trust levels for the politicians and the parliament are much lower than the trust levels for the police and legal system, but the power of the correlation is in reversed order. Suppose that you experience an one-point increase in the low representative trust variables. The impact on social trust will then be greater compared to the trust in police and legal system where the average is already high. This could also be influenced by the fact that the investigating institutions, that is the media, often are more focused elected officials as politicians then non-elected as the operational institutions. The media's reporting has a huge influence on people's opinions in most countries and could be an explanation to the high correlation between the representative institutions and social trust.

Our results indicate that it is highly important for the welfare of society that the people do not lose trust in the representative institutions as it may cause a great decline in social trust due to the strong correlation. Politicians and the parliament need be aware of this as an increase in social trust by one standard deviation predicts an increase by more than one half of standard deviation in economic growth (Knack and Keefer, 1997). If the same relationship is applicable to the declining trust levels, a political scandal could severely affect the country's economic development.

And what about Putnam's theory about the importance of civic engagement for a person's social trust? As mentioned in the results section, we see that our proxy for this engagement, has a positive estimated coefficient and in contrast to Rothstein the outcome from this variable is highly significant (p<0.01). Related to the tension in theories between Rothstein and Putnam, we can conclude that the estimated coefficient for social engagement is larger than the estimated coefficients for the institutional trust variables. As we however cannot derive the causal relationship for this variable either, we can only see that Putnam's theory about the meaningfulness of social interaction on a voluntary basis is supported in our specific dataset.

Examining the variables we added in Model 3 with, the most noteworthy result is the estimated coefficient for the variable feeling of safety when walking alone in the dark. This variable has the

largest reported coefficient out of all other variables in all three models. We interpret perceived safety as such a vital cornerstone for trust in general, that it is not possible to have a high trusting society if people are not feeling safe. One could argue that these two variables are inseparable as security is so fundamental that you cannot have trust in strangers if you are feeling unsafe in society. An interesting implication of this would be to look at for example how the actual crime rate correlates with the perceived safety and also trust levels, but that is beyond the scope of this thesis.

When decomposing social trust into our demographic categories, we see that aging implies to have a positive effect, unemployment a negative one and that females tend to be on average more trusting than men. If we were to make a personal profile based solely on the estimated coefficients from our regression, holding everything fixed, the most trusting individual in our sample would be an old but healthy woman, that is born and living in Denmark, who has a higher education, a job and is socially active and do not fear walking alone in the dark. Implications of this is for example that a higher unemployment rate can result in lower social trust, affecting society negatively. Employment and education levels are therefore crucial for countries that wish to keep social trust high, or could be investments worth making to increase the level of social trust.

Furthermore, the only demographic variable that did not give us the expected outcome was the immigration variable. Based on the ideas of Rödher and Mühlau (2012) we anticipated that immigration status would have a positive impact due to lower expectations of this individual, however the results show the opposite. The results contradict Rödher and Mühlau's ideas, which can indicate that they are built on a too extensive generalisation regarding the background of immigrants. Europe is an area with a lot of movement, and to assume that all immigrants come from countries with poorer institutional performance is questionable. We can however connect this result to other theories, for example to Eric Uslaner's theory about particular trust. He claims that people tend to be more trusting towards people that are similar to oneself, thus coming to a new country where the people have a different cultural background and other values might impact the ability to create trust and trustworthy relationships and supports our results from our immigration variable.

6.2 Is Sweden a special case?

Since our second hypothesis is derived from conclusions Rothstein made only by using data from Sweden, we find it interesting to see if Sweden actually is an unusual case, or if our results are limited to our dataset. As mentioned before, our results could be prepossessed by the specific dataset that we use, either by sampling or question design. By running the same regressions and hypothesis testing to our pooled cross-sectional dataset but limiting the sample to only the Swedish observations, we wish to see if this give us the same results. With this limitation, we end up with a sample of about 12 000 observations over all seven rounds.

5.3 Table showing the results from the hypothesis testing using Model 2 and 3, only using Swedish data (ESS, 2016)

	Model 2		Model 3		
	F-statistic	P-value	F-statistic	P-value	
Hypothesis 1:					
$H_0: \beta_{police} = 0, \beta_{legal \ system} = 0,$	6.51	0.0002	9.11	0.0000	
$\beta_{politicians} = 0, \beta_{parliament} = 0$				0.0000	
Hypothesis 2:					
$H_{0,1}:\beta_{police} \leq \beta_{politicians}$		0.9999921		0.99999971	
$H_{0,2}:\beta_{police} \leq \beta_{parliament}$		0.80142642		0.85775762	
$H_{0,3}$: $\beta_{legal \ system} \leq \beta_{politicians}$		0.9897729		0.99876663	
$H_{0,4}:\beta_{legal\ system} \leq \beta_{parliament}$		0.14131344		0.20544933	

From these tests we can see that the results actually are in line with the results from the full ESS population, indicating that Sweden might not be that different after all, but this still contradicts Rothstein's results. We run all three models and the same hypotheses and once again we can conclude that the joint effect of our four institutional trust variables are not equal to zero, and we still cannot reject any of the null hypotheses from our second hypothesis using either Model 2 or 3, even if the p-values are lower this time. This means that our result from the second hypothesis is not in line with Rothstein, and also questions the idea that Sweden in this perspective should be a special case with regards to social and institutional trust. Whether these results are true only for our specific dataset or the full population can however not be established, as it is not clear if our deviating results is due to measurement or sampling error or any other factors.

To summarise, we know that social trust and trust in public institutions are correlated with each other. We know that both these types of trust are essential for economic growth, for reducing transaction costs, for creating a stable society and for building powerful welfare states. Furthermore we also know that social trust is associated with low inflation, quality of infrastructure and educational achievement. With this in mind, our results from our regression models show that it is highly important for countries to promote reforms and initiatives that for example will keep unemployment low, education levels high, the population healthy and satisfied with their lives and encourage people to engage in social activities. Trust can be thought of as the social glue of the society, that holds it together and thus getting into a reinforcing social trap would be highly costly, both literally speaking in an economic perspective and for the society as a whole in the long run.

6.3 Limitations

One of the main limitations to our research is the fact that we were not able to test for causality in our model, which is one of the difficulties with survey methods. The best way according to most researchers to measure trust levels are often to use a combination of experimental and survey data to examine the same question (Berggren and Jordahl, 2006). This could have been the better approach, if more time and resources were available we would like to have done an experiment, similar to the one that Rothstein and Eek made to confirm or reject our results.

Since we did not have access to variables that are precisely equivalent to the ones that Rothstein used, we cannot draw any exact conclusions about his theories, we can only conclude if they are applicable to our specific dataset or not. Also one should have in mind that our findings are limited to the countries participating in the survey and to the time period when it was conducted. Our results may therefore be influenced by the fact that we use data from different time periods than Rothstein.

Furthermore, since our dependent variable of interest, social trust, is measured by the question "Most people can be trusted or you can't be too careful" that could be criticised as being a very vague question and open for interpretation, it is hard to disentangle if it measures the generalised or the particularised trust as stated by Bjørnskov (2006). One could therefore argue that we cannot be sure that the results we get when using this variable actually represents generalised trust, which our aim is, as it cannot be separated from particularised trust. The optimal choice

would have been to have a variable with less ambiguity, or separate questions for generalised and particularised trust.

6.4 Suggestions for further research

We hope that the current interest for this research field regarding the correlation between social trust and institutional trust will continue to grow and to be explored even further. We see that these two variables are connected to each other and we believe that the key to the next dimension in this research would be to determine the causal mechanism between them. Many have tried and reached different answers, but no universal theory has yet been accepted.

One influencer that we have touched briefly but would have liked to examine further is the effect of the investigating institutions on social trust. As described, media is a large influencer of public opinion and so also trust levels, and the effect would have been interesting to analyse further. Both in the relation to social trust, but also how it correlates to the different trust levels for the institutions.

To further connect the theories about social trust to economics it would have been interesting to incorporate some other variables in the regression. As mentioned in previous research, income, social class and political ideology are said to influence social trust and it would have been intriguing to see how they relate to the trust levels of different institutions.

Research by Algan and Cahuc's (2010) also emphasise the importance of the parent's values and the upbringing on an individual's social trust, we would have liked to have a variable incorporating these effects in our model, but we unfortunately did not have that opportunity this time. Thus for future research we think that this approach would be highly interesting to investigate further, seeing if children's social trust truly are reflected by their parents levels of social trust and through what mechanisms.

7. Concluding remarks

The aim with our thesis is to disentangle the relationship between social trust and trust in public institutions. To answer our question, we use the hypotheses if social trust and trust in public institutions is correlated with each other, and if this correlation is stronger depending on which type of these institutions you look at. Trust is currently a very popular research field in a political science perspective and it has laid the foundation for this thesis where we put two of these political science theories against each other and aspired to connect the result to an economic viewpoint.

When testing these theories, we have used a pooled cross sectional dataset from seven rounds of the European Social Survey, which gave us a very large sample with around 315 000 observations.

Testing the first hypothesis, we get the same result as our main researcher of interest, Rothstein, when he formatted this theory. The results state that there exists a positive relationship between social trust and trust in public institutions where we have tested the police, the country's parliament, the politicians and the legal system as public institutions.

Testing our second hypothesis, that social trust is more positively correlated with operational institutions (legal system and the police) than with representative institutions (politicians and the parliament), we do not obtain the same result as the theory suggested by Rothstein. We find this very interesting as we make a speculation of why the results deviate.

Our results imply that all public institutions should be careful and monitor their respective trust levels as they all may have an impact on the social capital and social trust levels. Declining trust levels should in all aspects be taken seriously as it could stunt economic development and growth, and obstruct everyday interactions. Mistrust creates a culture of toxicity and is easily spread, it slows down every interaction, as without trust we need to verify all actions.

We acknowledge that our research contains limitations. We are not able to actually test for a causal relationship between our trust variables, we can only see that they are correlated with each other. Deriving this causal relationship would in our opinion be the most interesting next step in this scene. In addition, we do not have perfect proxies for the all the variables that Rothstein used when he tested his theory, indicating that we would not be able to draw precise conclusions

about his theories. Furthermore, we don't have access to all control variables that we would have like include into our extended model, such as the parental impact on social trust.

Whether Putnam's or Rothstein's trust theory is the correct one, we cannot decide. Our results show that both engagement in civic organisation and trust in public institutions is correlated with social trust, but we cannot determine the cause and effect. Furthermore, none of the two factors are shown as having the strongest correlation in our extended model.

With the outcomes from our regression models we can agree with Rothstein to some extent, that institutional trust affects social trust, but that this should be the only or most important variable for social trust we cannot say. Our conclusion from this is that there are many variables that all may affect the level of social trust, among trust to public institutions, and all are important for creating a well-functioning society.

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9. Appendix

9.1 Rothstein's corruption-trust theory:

- "The inference from public officials. If public officials in a society are known for being corrupt, partial, or untrustworthy, citizens will believe that even people whom the law requires to act in the service of the public cannot be trusted. From this, *they will make an inference that most other people cannot be trusted either*.
- The inference from people in general. Citizens will be able to see that most people in a society with corrupt officials must take part in corruption and similar practices in order to obtain what they feel their rightful due. They will therefore make an inference that most other people cannot be trusted.
- The inference from oneself. The individual will realize that to get by in such a society, he will himself have to take part in corrupt or clientelistic practices. Thus, being oneself an untrustworthy person leads to the same inference as in 1 and 2, namely that *most people cannot be trusted* (Rothstein, 2013)"

9.2 Descriptive of sample



Table showing distribution of sample population

Country code	Country	Frequency	Country code	Country	Frequency
AT	Austria	8445	IE	Ireland	14814
BE	Belgium	12455	IL	Israel	9786
BG	Bulgaria	8324	IS	Iceland	1322
СН	Switzerland	12131	IΤ	Italy	3682
CY	Cyprus	4401	LT	Lithuania	3786
CZ	Czech Republic	12484	LU	Luxembourg	3184
DE	Germany	20277	NL	Netherlands	13324
DK	Denmark	10706	NO	Norway	11644
EE	Estonia	10901	PL	Poland	11970
ES	Spain	11616	РТ	Portugal	12453
FI	Finland	14128	RU	Russia	10028
FR	France	12785	SE	Sweden	12658
GB	Great Britain	13391	SI	Slovenia	9218
GR	Greece	9758	SK	Slovakia	8711
HR	Croatia	3114	TR	Turkey	4271
HU	Hungary	9820	UA	Ukraine	9986

Tables showing demographic characteristics of sample







9.3 Full regression output Model 1, 2 & 3

	(1)	(2)	(3)
VARIABLES	ppltrst	ppltrst	ppltrst
trstlgl	0.178***	0.0709***	0.0679***
	(0.00953)	(0.00638)	(0.00663)
trstplc		0.0387***	0.0354***
		(0.00663)	(0.00599)
trstplt		0.0973***	0.0969***
		(0.0122)	(0.0122)
trstprl		0.0786***	0.0769***
		(0.00790)	(0.00764)
highedu	0.292***	0.308***	0.301***
	(0.0414)	(0.0405)	(0.0321)
polintr	-0.168***	-0.111***	-0.0945***
	(0.0257)	(0.0234)	(0.0201)
sclact	0.149***	0.143***	0.136***
	(0.0193)	(0.0179)	(0.0171)
corruption	0.0248	0.0414	0.0416
	(0.0459)	(0.0485)	(0.0505)
stflife	0.137***	0.116***	0.108***
	(0.00429)	(0.00457)	(0.00436)
health	-0.111***	-0.110***	-0.0943***
	(0.0192)	(0.0178)	(0.0130)
agea			0.00175
			(0.00133)
female			0.0946***
			(0.0187)
immigrant			-0.112**
-			(0.0471)
uempla			-0.0631*
			(0.0317)
pubemp			0.110***
			(0.0291)
rlgdgr			0.00368
			(0.00660)
aesfdrk			-0.274***
			(0.0329)
r2	0.0971*	0.116**	0.102*
	(0.0500)	(0.0549)	(0.0548)
r3	0.0912*	0.155***	0.138**
	(0.0496)	(0.0504)	(0.0506)
r4	0.0565	0.102	0.0649

Table showing full regression output from Model 1, 2 & 3 including all variables

	(0.0602)	(0.0604)	(0.0618)
r5	0.102*	0.169***	0.116*
	(0.0581)	(0.0573)	(0.0619)
r6	0.217***	0.303***	0.252***
	(0.0663)	(0.0694)	(0.0764)
r7	0.183***	0.233***	0.178***
	(0.0592)	(0.0336)	(0.0316)
AT	-0.956***	-0.783***	-0.780***
	(0.0636)	(0.0631)	(0.0578)
BE	-0.872***	-0.903***	-0.844***
	(0.0884)	(0.0915)	(0.0901)
BG	-1.675***	-1.575***	-1.465***
	(0.256)	(0.271)	(0.276)
СН	-0.524***	-0.530***	-0.514***
	(0.0121)	(0.0156)	(0.0114)
CY	-1.966***	-1.898***	-1.893***
	(0.124)	(0.135)	(0.129)
CZ	-1.091***	-1.009***	-0.912***
	(0.213)	(0.223)	(0.232)
DE	-1.169***	-1.031***	-0.972***
	(0.0635)	(0.0667)	(0.0646)
DK	0.361***	0.389***	0.364***
	(0.0211)	(0.0227)	(0.0256)
EE	-0.218*	-0.151	-0.0551
	(0.126)	(0.132)	(0.137)
ES	-0.654***	-0.635***	-0.580***
	(0.118)	(0.117)	(0.117)
FI	0.264***	0.289***	0.268***
	(0.0163)	(0.0195)	(0.0267)
FR	-1.315***	-1.223***	-1.182***
	(0.105)	(0.111)	(0.111)
GB	-0.613***	-0.503***	-0.409***
	(0.0525)	(0.0560)	(0.0580)
GR	-1.801***	-1.647***	-1.552***
	(0.226)	(0.235)	(0.231)
HR	-0.914***	-0.761***	-0.795***
	(0.220)	(0.229)	(0.227)
HU	-1.111***	-1.025***	-0.955***
	(0.196)	(0.204)	(0.205)
IE	-0.560***	-0.461***	-0.397***
	(0.0857)	(0.0898)	(0.0865)
IL	-0.856***	-0.610***	-0.609***
10	(0.122)	(0.136)	(0.139)
IS	-0.160***	-0.129***	-0.180***
	(0.0340)	(0.0362)	(0.0413)
IT	-1.195***	-1.111***	-1.060***
	(0.216)	(0.222)	(0.217)

LT	-0.467**	-0.390*	-0.224
	(0.189)	(0.206)	(0.209)
LU	-0.942***	-0.958***	-0.876***
	(0.0437)	(0.0473)	(0.0463)
NL	-0.208***	-0.216***	-0.166***
	(0.0232)	(0.0294)	(0.0254)
NO	0.319***	0.338***	0.300***
	(0.0223)	(0.0250)	(0.0251)
PL	-1.525***	-1.374***	-1.349***
	(0.216)	(0.225)	(0.219)
РТ	-1.404***	-1.298***	-1.252***
	(0.140)	(0.143)	(0.139)
SK	-1.482***	-1.445***	-1.357***
	(0.223)	(0.233)	(0.231)
SI	-1.339***	-1.260***	-1.279***
	(0.145)	(0.149)	(0.148)
TR	-3.200***	-3.148***	-3.047***
	(0.234)	(0.230)	(0.226)
UA	-0.874**	-0.776**	-0.652*
	(0.324)	(0.341)	(0.345)
RU	-1.378***	-1.360***	-1.270***
	(0.316)	(0.336)	(0.344)
Constant	3.945***	3.401***	3.835***
	(0.112)	(0.0889)	(0.114)
Observations	297,691	290,314	285,189
R-squared	0.179	0.197	0.206

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1