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SIZE MATTERS
The Impact and Relationship between Size of Government and Generalized Trust

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Contents

Abstract

This paper investigates the relationship between generalized trust and the size of government. Generalized trust has declined during the past 35 years globally. This matters for several reasons including that generalized trust correlates with growth, political participation and stability in society.

To test this relationship, we use the World Value Survey and the European Social Survey together with the Quality of Government dataset. We run two main models using unbalanced panel data. Covering a total of 105 countries for 35 years divided into six waves. We test four hypotheses which are: H_1: Size of government correlates positively and significantly with the level of generalized trust in society. H_2: Size of government does not correlate positively with the level of generalized trust when controlling for education, change in unemployment and inequality or other measures for welfare spending. H_3: Size of government Granger causes generalized trust. H_4: Generalized trust Granger causes size of government.

We find no support for hypothesis one and reject hypothesis one. Due to this we also reject hypothesis two. However, for both hypothesis three and four we find that both generalized trust and size of government Granger cause one another at a time span ranging from 5 to 15 years. This indicates that generalized trust is sticky in nature. The fact that both variables Granger cause one another indicates that there is a potential role for government to play in trust creation. However, the results also imply that given the current decline in generalized trust all over the globe and austerity policies enacted after the financial crash of 2008, that there is evidence that we might be experiencing a negative feedback loop. Something which the current state of research is not able to provide an answer on how to stop or start.

Keywords: Trust, Generalized Trust, Government Size, Granger causality, Social Capital

1 Introduction

It can be claimed that on a grand scale, the world has been steadily improving for the past 40 to 50 years. This is supported by increased HDI, increased GDP per capita in PPP (World Bank 2017; United Nations Development Programme 2017), increased life expectancy and decreased child mortality (IHME 2016), a reduction in the number and severity of conflicts (HSRP 2013), and an increase in the amount of democracy and freedom (Diamond 2015; Kagan 2015).[1] However, despite these improvements there are indications showing that the level of trust that people experience and especially trust towards strangers, generalized trust, has decreased (Pew Research Center 2017; OECD 2017a, 2017b).

The decrease in generalized trust and how we can either increase or decrease generalized trust matters for several reasons. Trust, and the lack thereof, has been linked to the current rise in populism as seen in the United States (US) and across the European Union (EU) (Inglehart and Norris 2016). Trust has been linked to growth rates (Knack and Keefer 1997; Zak and Knack 2001), institutional design and efficiency (Fukuyama 2000, 2001; Putnam et al. 1994; M. E. Warren 1999), political participation (Braithwaite and Levi 1998; Letki 2003), facilitation of trade and the lowering of transaction costs (Fukuyama 2001), corruption (Uslaner 2004), and how inclined a society is to redistribute wealth (Bergh and Bjørnskov 2011, 2014; Rothstein and Uslaner 2005). All of this indicates that trust can be found in the centre of several challenges that currently face governments; from backlash against the establishment and globalization (Inglehart and Norris 2016), to tackling income inequality.

Empirical studies on trust have yielded several insights, of note are studies that have found that trust increases growth and investment (Knack and Keefer 1997; Zak and Knack 2001) and lowers corruption (Uslaner 2004). Studies have also found that trust can be lowered by corruption (Rothstein and Uslaner 2005), a heterogeneous society (Alesina and La Ferrara 2002; Bjørnskov 2006, 2007; Delhey and Newton 2005), and income inequality (Kumlin et al. 2017; Leigh 2006). Several studies have found indicators on what can change the baseline of trust in society, key findings being a shared identity, history, or the level of education in a society (Alesina and La Ferrara 2002; Bjørnskov 2007; Fukuyama 2001; Rothstein 2011).

There are still questions left unanswered in regard to how society can create generalized trust, especially regarding to what effects certain institutions have in general, and government

[1] Increases in democracy and freedom have admittedly levelled off recently; however, on a grand scale of the past forty years the trend is undeniably positive.

in particular (Cawvey et al. 2017; Coleman 1988; Herreros 2004; Paxton and Ressler 2018; Putnam et al. 1994; Putnam 2001). Which direction causality goes is also not fully established (Bergh and Bjørnskov 2014; Kumlin et al. 2017; Rothstein 2005). This issue is exacerbated due to that societies having a tendency to enter either a positive- or negative feedback loop (Uslaner 2018).

When it comes to the creation of trust there are two main perspectives - the bottom-up and the top-down approach (Newton et al. 2018). The top-down, or institutional, perspective is that social capital is considered a consequence of institutional aspects in society – such as the degree of economic equality and opportunity as well as security, and that trust is created from above (Kumlin and Rothstein 2005; Kumlin et al. 2017; Rothstein and Stolle 2003; Rothstein and Uslaner 2005; Uslaner 2008). The second perspective is the bottom-up or civil society perspective. Trust is something that is created between people based on interaction, networks and associating with one another and rises from the bottom-up (Fukuyama 2001; Putnam 2001).

While the above are not necessarily mutually exclusive, they have different implications for when it comes to the role of government and trust. There are currently two main perspectives on what the relationship between the government and trust is. One side proposes that government has an active role in the creation of trust by reducing inequality, providing education, and universal social welfare amongst other things and to create trust from a top-down perspective (Rothstein and Uslaner 2005). The other side argues that government crowds out trust-creating activities and actively lowers trust through for example corruption and repressive actions and stops trust from being created from the bottom-up(Fukuyama 2001; Putnam 2001; Uslaner 2004).

While the topic of effect of the size of government and level of trust is not a new phenomenon, there are disagreements in the contemporary literature in what direction causality goes and whether there is a feedback mechanism or not (Bergh and Bjørnskov 2011, 2014; Kumlin et al. 2017). This paper will endeavour to address these arguments. Another issue that this paper tackles is that contemporary studies at the forefront focus almost exclusively on a cross-sectional approach and argue that trust levels in general are static, and as such do not take current downward trends in various trust variables into consideration.

To our knowledge this will be the first study to use panel data to measure the relation between the size of the government and trust. There are three distinct advantages to the approach chosen. The advantages of our approach are that it takes into account modern historical trends of trust, it deals more directly with questions regarding the direction of

causality, and if a fixed effects model is appropriate also deals with omitted variable bias. Moreover, a panel regression is superior to cross-section Ordinary Least Squares (OLS) in dealing with questions of endogeneity.

1.1 Purpose, Aim, and Research Question

It is our intent to bridge part of the gap between current arguments in the field, specifically concerning the effect of the size of government, and the direction of causality. The purpose of our study is to clarify the effect of the size of the government, and the welfare system with the level of trust experienced in a society. Given this, we raise three questions:

Q1- Does the size of government affect the level of generalized trust in society?

Q2- What is the sign of correlation between size of government and generalized trust?

Q3- If there is a link between size of government and trust, what is the direction of causality?

1.2 Method and Data

To test the above, we run a variety of models using unbalanced panel data together with a control variable strategy. As a robustness strategy we use different measures for our independent variable on cross-sections of our sample to better isolate and interpret the effect of the size of government.

Data is based on the World Value Survey (WVS) and European Value Survey (EVS) for our measures of trust and cover the time period between 1981 and 2014. These surveys cover six different time periods in total. All data is from the Quality of Government dataset (QoG)

1.3 Delimitations and Limitations

Several delimitations are made in order to answer our research questions. First, we focus on generalized trust and no other forms of trust. Results for other measures of trust are only taken into account to the extent that they extend our understanding of the relationship between size of government and generalized trust. This is a conscious decision given the potential scope of measures that could represent trust in general. The second delimitation is that this paper focuses exclusively on the relationship between the size of government, and generalized trust in society. This implies that while we are aware of that there are other variables that affect trust in society, due to the amount of known, and unknown, variables that interact with trust a conscious decision was made to focus exclusively on the interaction between trust and the size of

government. As such, any variable that affects generalized trust is used only to clarify the role of trust and its interaction with the size of government.

There are however limitations given the chosen approach and method. The two main limitations of concern to the reader are regarding data and method respectively. The first limitation concerning data is the definition of generalized trust. While surveys measuring trust in society are not uncommon and there is an accepted consensus on the formulation of questions there is ambiguity on what exactly should be understood by trust when answering such a survey or what people themselves include in their definition of trust when answering the surveys (Bauer and Freitag 2018). However, despite these concerns research has indicated that in general people seem to understand the question as intended and the understanding of the question does not seem to differ to any significant extent amongst respondents (Delhey et al. 2011; Uslaner 2002). Though as is inherent to any survey that tries to measure a variable like trust through surveys, there are risks in the measurement of the variable.

The second concern regarding data is the availability. While almost a majority of countries globally have had surveys conducted by our two main data sources, the WVS and EVS, there are a lot of countries missing. A potential issue could be bias in data, in effect that the countries where surveys are even able to measure trust, are countries where trust is higher. In other words, countries affected by civil war, famine, or other society-altering events would most likely not be able to provide figures for trust. Furthermore, even in countries where data is available, the availability and extent of that data varies greatly. Another concern with data is that due to different countries being included in different waves, we use unbalanced panel data. Furthermore, integrating other datasets is possible but leaves us at times with gaps in data.
The theoretical difference between using balanced and unbalanced panel data are minimal though there are mathematical differences. More importantly, there is a potential endogeneity issue based on the unbalanced nature of the data. As can be seen from the descriptive statistics in section 3.2 the first wave was largely conducted in developed economies. However, even during the first wave there is a spread of countries around the globe, covering varying income levels and all continents. Later waves include more countries, with a total 105 being represented at some point. Subsequently, we do not expect our data to suffer from selection bias at the country level.[2]

The second major limitation of this study is the lack of a natural experiment. As such, we are aware of that we cannot prove, in a scientific sense, causality. Rather, it is our intent to

[2] Individual sampling methods are expanded upon under section 3.2.1

as best as possible, analyse current arguments, build upon them and contribute to the current research frontier until such a natural experiment is available. Another potential limitation is that a fixed panel regression amplifies any measurement error in the data. This issue is potentially exacerbated by the nature of the data used. We are aware of this issue but feel that given the extent of data available as well as the approach we use in regard to robustness tests allows us to gain a clear understanding of the issue at hand.

1.4 Disposition

This paper has five sections. The first section introduces the subject at hand and the paper. The second section presents the theory underlying the paper, with a focus on trust. Specifically, we cover the definition of trust, disagreement in the field, known variables, the interaction between government and trust as well as providing hypotheses. The third section focuses on description and explanation of method, data, and variables respectively. The fourth section presents results and analysis based on our results, as well as robustness tests. The fifth and final section concludes the paper with a view on what has been done, how it fits into contemporary results within the field, and how it can be used in the future, either for research or policy.

2 Theory

2.1 What is Trust?

The purpose of this chapter is to introduce the concept and trust and the theory surrounding the creation of generalized trust and the relationship between generalized trust and the size of government. The chapter can be divided into three main parts. The first part is dedicated to provide an answer to what trust is, when we trust, and who we trust. The second part focuses on the relationship between government and trust. The third part of this chapter presents our hypotheses.

Within the field of economics, the view on trust can be divided into two major categories. One side argues for that trust is an independent variable that exists regardless of context and is general in scope. The opposite view is that trust is a learned experience and context dependent. However, whether trust can also be affected by more recent events rather than exclusively being a characteristic that is learned at a young age that remains stable is currently contested (Hardin 1992; Rothstein 2005; Uslaner 2002).

Uslaner (2002) defines trust as an individual simply trusts, without context needed. Trust is a moral norm and people trust for the reason that they believe it is moral and good. Trust is not a skill that is learned or acquired by life experiences but rather exists independently and remains fairly stable throughout life (Uslaner 2018). Another argument for the independence of trust is that trust has a biological basis, which is to say that trust is inherited. There exists some evidence that at least part of trust is hereditary and encoded in our genomes. Biology alone however has not provided a sufficient explanation for what is the most dominant cause of trust and as such the debate and disagreement mentioned above is not only valid but provides one of the central points of disagreement in the literature on trust (Cawvey et al. 2017).

Rothstein (2005), arguing for trust being context dependent, defines trust as being based on information devices, arguing that expectations of people's behaviour influences our trust. Rothstein argues for a distinction between trust and blind faith. Rather experiences and knowledge of our situation influences our general trust level (Rothstein 2005: 58-59). Hardin also argues for a context-based understanding and argues that an individual only trusts another individual in regard to a specific context or action. The basis for this is learned experiences and the perceived trustworthiness of the person that is to be trusted with regard to a certain action.

Hence, according to Hardin, the issue that should be investigated is trustworthiness and not trust as trustworthiness is a priori to trust (Hardin 1992). Hardin argues that there can be

no such thing as general trust and that even if one in general would trust a person such trust is based on our expectations of that person in the context of our relationship (Hardin 2002: 13-14). Built on this definition of trust is the application of rationale choice theory on trust. Trust is seen as the outcome of cognitive process that proceeds trust. When an actor decides to trust it is merely the outcome of a game where the actor reacts rationally, even when rationality is bounded (Cook and Santana 2018).

Another dimension that has been proposed is to differentiate between the bottom-up and top-down view. That is to say to separate between the mechanism for individual people that create trust or distrust and underlying factors which affect general trust more broadly in society. The differentiation between a top-down and bottom-up approach could help explain why different definitions and views on trust can lead to different outcomes. (Newton et al. 2018). The effect of trust can be explained as the difference between a one-off prisoners dilemma, compared to the expected pay-off in a repeated games scenario. While different forms of capital affect the size of a pay-off, trust affects which pay-off is a viable option (Coleman 1988: 306). That is, trust changes what is seen as a one-off, to a repeated game – even if you never play with the same actor again, because the players in this scenario expect what comes around to go around. This allows for a better outcome than what an individual might otherwise consider a viable option.

While the above focus on the nature of trust, trust itself can be divided up into different categories dependent on who we trust, or the type of trust we feel. As seen in figure I trust can be divided up into two main categories, social trust and political trust. Where social trust is based upon the trust one feels towards other people, and political trust is based on the trust people feel for institutions. Furthermore, social trust can be classified into two major groups, generalized trust and particular trust. Generalized trust is the trust people feel towards strangers or people they are unfamiliar with, while particular trust is the kind of trust that people feel towards particular individuals in their vicinity, such as family or community. Social trust can be seen as an axis which goes from people with whom I identify with or to whom I am very close with and to stranger on the other end. Political trust on its part, can be divided up into trust in different institutions, including but not limited to, the president or prime minister, members of parliament, police, healthcare, or education.

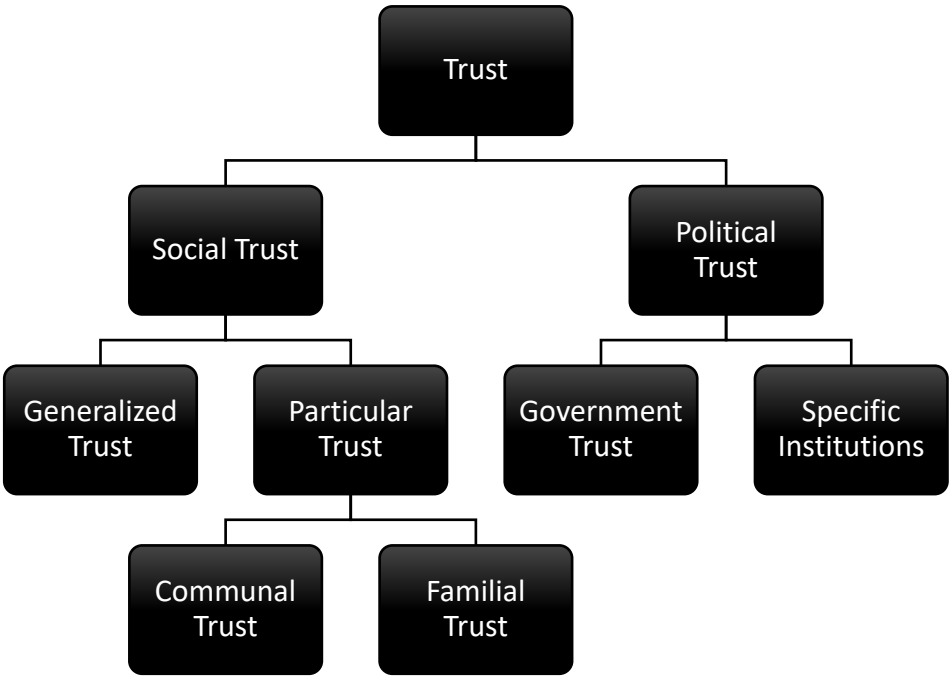

Figure I Types of Trust

Since social trust can be divided up into particularized trust as well as generalized trust there are both common and more overarching variables that are statistically significant for both as well as variables that only seem to be significant for one variable, for example wealth, where research indicates that the wealth of an individual is significant for generalized trust but not for particularized trust (Newton et al. 2018).

The difference between social and political trust are twofold. The first difference is the recipient of trust, that is the individual or institution one trusts. The second difference between the two is what creates or destroys trust. According to Newton, Stolle, and Zmerli (2018) there are several common variables that seem to correlate positively with social and political trust, which include "good government, national wealth, economic equality, and cooperative social relations". However, changes in circumstances might decouple political and social trust even in societies defined by the above characteristics when these changes occur quickly or are drastic in nature. This is expected to affect political trust more strongly as there is evidence that generalized trust is more resilient and takes longer to change (Newton et al. 2018).

2.2 What Affects Trust?

Moving on to generalized trust specifically, there are severable variables that have been found to have a significant relationship with generalized trust. These include education, income inequality, corruption, unemployment, subjective happiness, globalization, age and the amount

of fractionalization in society as well as whether the countries are former communist countries or are Nordic countries (Alesina et al. 2003; Bjørnskov 2007; Nannestad 2008).

Education has been consistently significant in studies regarding trust, regardless of type of trust (Alesina and Ferrara 2000; Knack and Keefer 1997; Nannestad 2008; Newton et al. 2018; Putnam 2001). While the mechanism is a bit unclear in regard to causation, as it could both be that education is more prevalent in what Newton et al (2018) call the winners in society or that education fosters a greater understanding, it is also possible that education spending is a result of high initial trust. However, given the strong correlation between life outcome and life satisfaction between education as well as trust, and the results in previous studies it is likely that increased education remains one of the most reliable ways to increase trust in society through government spending (Gur et al. 2015; Newton et al. 2018).

However, on the other hand a study from 2007 found no correlation in a cross-country study between education and trust, though this study remains an outlier (Bjørnskov 2007). The argument is based on that education and trust are based on reverse causality. Hence, when properly specified, no causal relationship going in the direction of education towards trust could be established, even when using an IV-strategy (Bjørnskov 2007).

The second variable that has shown a significant relationship with generalized trust is the level of income inequality in a society. Increased income inequality since 1970 in developed countries (Dabla-Norris et al. 2015) could be a potential explanation for the general decrease in generalized trust (Inglehart and Norris 2016). Newton at al. (2018) find a strong and consistent negative correlation between trust and income inequality. Income inequality is strongly correlated to dissatisfaction with quality of life as well as levels of (lack of) optimism, again tying in to the argument of winners and losers in society (Newton et al. 2018). However, income inequality does not seem to correlate or interact with income levels in regard to trust, potentially confirming the happiness paradox observed in studies measuring happiness and life-satisfaction (Kumlin et al. 2017).

While government spending and redistributive welfare policies impact the level of inequality in society, causality is again questioned (Bergh and Bjørnskov 2014). While income inequality was significant for the level of trust, changes in net-inequality did not seem to impact the levels of trust; furthermore, it is unclear whether inequality precedes redistributive policies and hence it is not the redistributive policies per se that decrease trust (Bergh and Bjørnskov 2014). Similar stickiness in regard to generalized trust and income inequality was found after the great recession from 2008. While austerity policies increased income inequality and had a marked effect on political trust, generalized trust seemed more stable (Newton 2006).

However, this would be in line with what Uslaner has proposed, in that a sticky base-level of generalized trust is generated at a young age which is difficult to change (Uslaner 2002, 2018). Hence a cross-section survey would be unable to capture the trust-generating effect of reducing income inequality as this would likely only affect younger generations in a significant way. This would also be in line with research concluding that levels of generalized trust in younger generations is much lower than older generations (Helliwell et al. 2018; Putnam 2001).

The third variable that has been shown to be significant is unemployment support. In recent studies from 2017 and 2018 unemployment policies have shown a significant correlation with generalized trust where unemployment coverage positively correlates with trust, while unemployment levels negatively and significantly correlates with generalized trust (Bauer and Freitag 2018; Kevins 2018; Kumlin et al. 2017). Unemployment coverage provides security while active labour market policies increase employment levels and provide active support while searching for a job. Both seem to indicate that government welfare spending can increase trust (Kumlin et al. 2017; Newton et al. 2018). The direction of causality has been questioned, arguing again that high initial trust levels make expenditure on unemployment support a viable option (Bergh and Bjørnskov 2014) though it is possible again that there is a feedback mechanism which creates difficulty in deciding on cause and effect.

The next factor that has been found to consistently correlate with generalized trust is corruption. Corruption is a form of abuse of trust and can therefore be considered by definition as untrustworthy behaviour (You 2018). Corruption has been found to significantly correlate with a decrease in trust (Alesina and Ferrara 2000; Bjørnskov 2007; Porta et al. 1997; Uslaner 2004). The question regarding corruption is less about the direction of correlation but the mechanism of causality. You (2018) argues for that perception of corruption plays an important role in addition to actual levels of corruption, as it can be difficult for an individual to estimate the level of corruption without self-participating in a corrupt act. Likewise, media reports on a large corruption scandals can increase the perception of corruption. The causal link from corruption to trust has been questioned, a study from 2013 did not find any evidence for Granger causality though another study from 2014 found some evidence for a feedback mechanism between the two (Graeff and Svendsen 2013; Serritzlew et al. 2014).

The idea of a feedback loop has been proposed by both Rothstein and Uslaner, where low trust leads to more corruption, similarly high initial levels of trust or low levels of corruption lead to more trust or less corruption respectively (Rothstein and Uslaner 2005; Rothstein 2005; Uslaner 2008). However, it is again unclear what starts a feedback loop, furthermore it is unclear whether the effect of corruption is constant given government size or

size dependent, meaning, is a larger government more vulnerable to loss of trust due to corruption scandals. Basing this reasoning on You (2018) and the argument around perception of corruption, it is possible that a large governmental sector provides more opportunity for corruption and could then, all else equal, lead to a greater perception of corruption in absolute terms even if corruption in relative terms or per capita levels would be in line with a similar nation but with a relatively speaking smaller government size.

The next factor is fractionalization. Fractionalization encompasses both religious and ethnic fractionalization. Though generalized trust per definition is based on trusting others there still seems to be a bias towards people that in most aspects are similar to one self, even when this refers to people outside of one's own (Dinesen and Sønderskov 2017). There are two types of diversity that have shown statistical significance, religious and ethnic diversity (Alesina et al. 2003; Bjørnskov 2007; Dinesen and Sønderskov 2017; Nannestad 2008; Wilkes and Wu 2018). Two main mechanisms have been proposed in the generalized trust literature for this phenomenon, that familiarity breeds trust, and conflict theory. Conflict theory is the idea that different groups have inherent friction between them which creates conflict. In simplest terms the first explains why trust is higher to people we feel alike to, even in regard to strangers. The second explains why heterogeneity also can erode generalized trust. The first mechanism argues for that people in general prefer what is like them, and accordingly dislike or like to a lesser degree what is different from them (Dinesen and Sønderskov 2017). The second mechanism argues that differences actively can erode trust for both people similar and dissimilar to oneself. Contact with outside groups would, according to this mechanism, lead to conflict when coming in contact with groups seen as different. This conflict would then lead to a loss in trust based on past experiences of interaction with said group.

However, an alternative explanation has been proposed that argues that this effect is misunderstood, and that the lack of trust does not stem from heterogeneity and conflict but segregation (Uslaner 2012: 22-24). Uslaner (2012: 23) argues that superficial contact leads to the consequences expected by conflict theory while deeper and more meaningful interaction creates trust. Another significant finding in this context is that while immigrants in a society generally have lower generalized trust than the rest of the population, political trust is generally higher (Wilkes and Wu 2018).

When it comes to the particular relationship between trust and politics, it is conceivable to imagine that general trust and politics go hand in hand. If one feels alienation from the political system in place it is plausible to envisage that one's trust in others suffers as well (Inglehart and Norris 2016). According to Uslaner (2000, 2015) partisan division in the US

comes from declining generalized trust. Showing that the channel between polarization and trust is through economic inequality – as the conflict between political parties is reflected in the division of top and bottom on the economic ladder. The political environment is by nature rooted in civic engagement and thus connected with the notion of social capital and ultimately the various classifications of trust. This link is based upon that people who trust fellow citizens will be more likely to be involved in their communities and political activity (Uslaner and Brown 2005).

In a recent study from 2016 the authors argue that increasing globalisation is one of the leading factors for the rise in populism and loss in generalized trust (Inglehart and Norris 2016). Fukuyama (2001) describes globalization as a determinant source of social capital in developing countries; postulating that globalization might foster net gainers or losers depending on whether globalization breaks down traditional cultural communities without leaving anything positive behind or introduces dysfunctional communities to modernity. Bjørnskov (2003) finds that globalization only increases the coefficient on social capital vaguely and trade is insignificant but with a positive coefficient. Thus, suggesting that globalization does not erode social capital.

Well-being is another variable that has shown a significant relationship with trust. The link between well-being and trust has its roots in a hypothesis that states that people will be less healthy the greater the social distance between top and bottom is (Jen et al. 2010). The link between social cohesion and inequality relates to trust as social cohesion and social capital is interwoven. The link between size of government and well-being is that the government plays an important role in influencing health, well-being, inequality and ultimately welfare. Putnam also advocates for controlling for well-being as Putnam argues that human happiness is more closely associated to social capital than financial capital (Putnam 2002: 8). Well-being also includes the idea of happiness. While happiness is in general not predicted by income for example, it is strongly correlated with levels of income inequality, a variable that as mentioned shows strong correlation with levels of generalized trust.

Another variable that has shown to impact trust is age. Trust between generations differ significantly. Depending on country, younger generations have both significantly higher and lower trust than older generations (Helliwell et al. 2018; Putnam 2001). As mentioned Uslaner argues that the base for trust levels is created at a young age and remains sticky (Uslaner 2002, 2018). Hence, context-specific circumstances during formative years would lead to differences in trust.

The two final variables that have shown a significant relationship in several studies are dummies for Nordic countries and former communist countries respectively (Bjørnskov 2007; Delhey and Newton 2005; Nannestad 2008). The Nordic countries rank highly in both subjective and objective measures regarding trust, income inequality, and levels of corruption (Uslaner 2008: 215-16). Likewise, former communist countries in eastern Europe have lower generalized trust, trust in institutions, higher inequality, and levels of corruption that would otherwise be expected (Uslaner 2008: 97-99). For a variety of contextual reasons trust in these two groups are significantly higher and lower respectively, and both constitute significant outliers.

2.3 Government and Trust

The main object of this study is how government and government size can impact the general level of trust. There are two main camps in regard to how the interplay functions. One side argues that government crowds out a variety of social institutions and associations which leads to decreased opportunity for building and creating trust.

The other argument is that a strong government with universal welfare programs reduces the risk associated with trust and through a variety of knock-on effects on job-security and decreased inequality, especially in regard to income inequality, as well as education spending can create trust (Kumlin et al. 2017).

2.3.1 Crowding-out

When it comes to the crowding-out argument it has its foundation in that government welfare crowds out trust-creating activities (Fukuyama 2001; Barone and Mocetti 2016). A large welfare state can actively reduce the need, and pay-off, for being engaged in civil society (Stadelmann-Steffen 2011). Hence, a central question is how voluntary participation in non-governmental associations can create trust, especially how that trust creation between members, a form of particularized trust, leads to increased general trust. There are two main trust-creating channels, the first is that participation creates a norm of co-operation (Paxton and Ressler 2018). Because of the voluntary nature of associating in non-governmental groups Paxton and Ressler (2018) argue that trust-creation is relatively speaking more powerful in voluntary associations. The second is that voluntary associations have a mechanism for sanctioning and excluding untrustworthy members (Paxton and Ressler 2018). However, Putnam (2000:58) says that it is required for members to in fact be active members of an

association, shallow participation or merely being a member of an association will in itself not be trust-creating.

It has been shown that a large welfare state does lower participation in voluntary organisations (Stadelmann-Steffen 2011). Putnam (2000) argues that the decline in participation of different civil societies is the main contributing factor in the decline of generalized trust in the US.

However, at this point two caveats need to be made. The first is that not all participation necessarily creates trust and that participation in some organisations can even create distrust. The second is that evidence for the crowding-out theory are mixed. Participation in an association can create distrust under two particular circumstances, based on the goal of the organisation and the make-up of the members. If the goal of the organisation has its base in a trust-lowering activity or is antagonistic in nature, participation will likely lead to lower generalized trust (Beyerlein and Hipp 2005). Similarly, if the make-up of a group is to homogenous it is possible that the association facilitates particularized trust at the expense of generalized trust (Paxton and Ressler 2018). In a literature review conducted by Kumlin, Stadelmann-Steffen, and Haugsgjerd (2017) the authors find only limited evidence for crowding-out but limited to values other than generalized trust, and even find a positive correlation between size of government and participation in trust-creating associations.

2.3.2 Government Increases Trust

The other side of what the role government can be, is that government welfare and support can increase generalized trust. There are two main ways in which government size can affect trust. The first is by lowering the amount of risk when trusting others, which will make trusting others a viable option. The second aspect is based on government spending on trust creating factors such as education, reduction in inequality, as well as actively working against discrimination and corruption. All of which significantly correlate with higher trust (Cook and Santana 2018; Kumlin et al. 2017; Wilson 2018).

By providing security and reducing the risk of trusting others, generalized trust will be facilitated. In a study from 2018 there was a significant correlation between being risk-averse and the willingness to trust others in a variety of simulated games (Wilson 2018). The mechanism has its root in that trust is seen as a risk. Risk-averse individuals will, all else equal, show trust in a wider variety of circumstances when government welfare is able to reduce risk for those encounters (Cook and Santana 2018). While the type of benefits extended and security

provided matters, However, the effect of government size will depend on whether a government in question is corrupt, repressive, stable, and democratic (Warren 2017).

The second and indirect way in which government size can affect generalized trust is by direct correlation of spending on education and unemployment as mentioned above. As the mechanism through which unemployment and education impact trust creation have all been mentioned above, it will suffice to say that increased spending on the above, if the theory is correct, should increase trust further.

2.3.3 Summary

In summary the discussion regarding the role of government size can be tied to the discussion of a bottom-up or top-down approach to trust. A bottom-up view of trust overlaps with the view of trust being the result of interaction facilitation through participation in voluntary organisations while government welfare institutions represent a top-down view on trust-creation. As such the argument regarding the role of government is not only about the view on government, but the core of trust-creation – is it built through top-down reforms or bottom-up interactions with an important question left unanswered - does either channel come at the expense of the other in regard to government size. If they do, we would at best expect some significant positive correlation or expect no significant results or even negative results for the size of government and trust. If they do not come at the expense of one another, then size of government should purely impact trust in a positive way, if there is any effect at all.

One question that this paper will address is the direction of causality. While certain variable such as education, corruption, fractionalization as well as inequality have been established as significant factors in previous research the direction of causality is as of time of writing unclear. As mentioned there are three different views. The first is that welfare policies and a large government causes trust, the second is that high levels of trust allow for large government, the third view is that both are correct and societies tend to either enter a virtuous-cycle or a negative-cycle.

Through reducing inequality, reducing the risk for trusting others, increasing education and good governing in general government policies can create trust (Barone and Mocetti 2016; Gur et al. 2015; Kevins 2018; Newton et al. 2018; Uslaner 2012). However, the second view states that the causality between trust and welfare is the reverse. Particularly it is the high initial trust that exist for historical or cultural reasons that allow people to trust and agree upon welfare and redistributive policies (Bergh and Bjørnskov 2011, 2014; Kumlin et al. 2017). The third view argues for that both reinforce each other and hence both sides would arguably be correct

(Rothstein and Uslaner 2005; Rothstein 2005; Uslaner 2012). However, while a feedback mechanism would reconcile the two former arguments it fails to explain what starts a cycle or the effect and impact of particular policy.

2.4 Hypotheses

Given that our research questions are:

Q1- Does the size of government affect the level of trust in society;

Q2- Is the correlation between size of government and generalized trust positive or negative?

Q3- If there is a link between size of government and trust, what is the direction of causality?

We have the following hypothesis:

H_1: Size of government correlates positively and significantly with the level of generalized trust in society

H_2: Size of government does not correlate positively with the level of generalized trust when controlling for education, change in unemployment and inequality or other measures for welfare spending

H_3: Size of government Granger causes generalized trust.

H_4: Generalized trust Granger causes size of government.

3 Method and Data

3.1 Method and General Specification

The disposition of this chapter contains three parts. The first is methodology and approach. The second consists of model specification. The third part contains data description. To be able to test our hypotheses and answer our research question two different primary models will be used, all with a panel data structure. The general form equation will take the following form:

$$Trust = f(government\ size, controls) \tag{1}$$

More specifically to answer H_1 we want to model the impact of size of government while controlling for factors that we do not expect to impact generalized trust through the size of government. Hence the general form equation to test H_1 will be:

$$Trust = Government\ size + Corruption + Migrant\ stock + Globalization + Wellbeing + Age + Nordic + Communist + \varepsilon \tag{2}$$

This equation allows us to include all the effects that government size has on trust through education spending, redistributive policies as well as welfare spending.

To test our second hypothesis, we will now include controls for the hypothesized three main channels through which government size would affect levels of generalized trust. In this model the effects specific to these three channels will be measured individually. Here we would expect government size to be insignificant while the three additional control variables all are significant.

$$Trust = Governemnt\ size + Education + longterm\ Unemployment + Inequality + Corruption + Migrant\ stock + Globalization + Wellbeing + Generation + Nordic + Communist + \varepsilon \tag{3}$$

To test our third and fourth hypothesis respectively, we will run a Granger causality test on trust and size of government. Specifically, this is to test whether there is a potential feedback loop or not as hypothesized by Uslaner and Rothstein (2005), or whether the direction is one dimensional, and if so in what direction.

In both models for hypothesis one and two we adopt a panel data approach that is parallel to the approach used by Barone and Mocetti (2016). The implementation of panel data is due to the properties and implications of panel data but also due to data availability. This allows us to analyse a wider array of economic questions. The benefits supersede those of

traditional cross-sectional or time-series data sets as it gives us larger number of data points, an increasing degrees of freedom and deals with unobserved confounders.

There are several benefits from using a panel data approach: panel data has less collinearity among variables – more degrees of freedom, controls for individual heterogeneity, reduces identification problems, and is better for studying dynamics of adjustment than traditional cross-section or time-series data. (B. Baltagi 2008; Hsiao 2014)

Implementing a panel data approach is possible due to the design of the WVS and the EVS. Both will serve as the basis for our analysis of the research questions and will be introduced in more details under data description. One empirical concern about the use of a panel data approach using trust as a key variable has been the lack of variation; however, recent research has argued that there is enough variation in the trust variable (Barone and Mocetti, 2016). Examining descriptive statistics under 3.2.3 table I confirm this, with a standard deviation of 8.7 percentage points for the change in trust. The six waves of the WVS allows us to have appropriate variability for efficient results. Furthermore, the idea that there has not been enough variation in the trust variable runs directly counter to the experience of most European and Anglo-Saxon countries, as well as reports published by the OECD and think tanks in recent time which argue for a decline in trust (Pew Research Center 2017; OECD 2017a, 2017b).[3]

To test the robustness of our results two main strategies will be used. First we will run our models with different independent variables to check whether our results change. The second robustness strategy used is to run our results on subsections of samples. This will allow us to see whether results are universal, or are only applicable to certain regions and whether our results hold if certain countries are excluded. Specifically, we will run our models on subsamples representing: OECD, Sub-Saharan Africa, North Africa and the Middle East, East-Southeast Asia, and Latin America, respectively.

In the appendix we will also present results where we change our dependent variable from generalized trust to political trust. This is due to that several variables should have a different effect on generalized trust and political trust, specifically the mechanism that government size is hypothesized to work through. That is reducing inequality, increasing education and providing unemployment support are not expected to affect political trust long-term.

[3] This can be seen under descriptive statistics in Table I with the mean change per wave being a decline of 1.2 percentage points per wave in generalized trust for our sample as a whole.

3.2 Data Description

3.2.1 Dependent Variable

The data for our dependent variable that constitutes the basis for this paper is from the WVS and the EVS. The data is aggregated and consists of a total of six waves of surveys covering the period from 1981 to 2014. The first wave from 1981 to 1984 includes 22 countries, second wave from 1990 to 1994 includes 34 countries, the third wave from 1995 to 1999 includes 62 countries, the fourth wave from 2000 to 2004 includes 39 countries, the fifth wave from 2005 to 2009 includes 76, and the sixth wave from 2010 to 2014 contains 58 countries. Full summary of countries in each wave for both surveys can be found in appendix A.

Both data sets were designed to be compatible and able to be integrated with one another. The result is a total of 291 surveys for 105 countries from 1981-2014. Figure II provides a visualization of the countries with data as well as how many surveys they are included in.

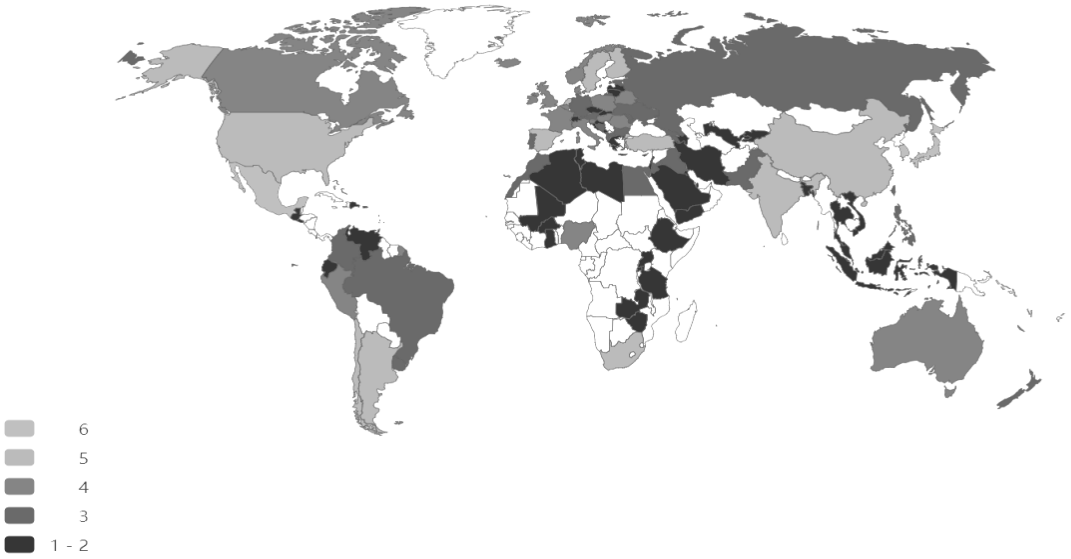

Figure II World Map according to amount of surveys participated in

The main method of data collection for both surveys were face-to-face interviews at respondent's place of residence in their respective national languages. The respondent's answer was noted in a paper questionnaire or by computer assisted personal interview software for later waves. When possible, and in most of the cases, data for the WVS and the EVS was collected through stratified multi-stage random sampling to estimate characteristics of the whole population of the given country with a sample size of about 1,000-2,000 per country.

Samples were selected in two stages. First, a random selection of locations was made and then a random selection of individuals for those locations (Inglehart et al. 2000).

Response rates vary from country to country but generally when recorded have been above 50 percent. In Norway, Denmark and Sweden response rate were approximately 71percent during the first three waves. The highest response rate recorded was for the Czech Republic with 96percent in the 1990 survey. A quota sample was also used in the survey design for a limited amount of countries. However, most of the participating institutes the quota sampling did not keep standardized response records (Inglehart et al. 2000). Thus, for both the WVS and EVS it is hard to compare response rates across countries because some were executed with random sampling and others with quota sampling. However, in general we feel confident in the quality of the data provided in part due to the construction and design of the data and in part based on the use of it in previous studies on trust (Barone and Mocetti 2016; Bergh and Bjørnskov 2014; Bjørnskov 2007; Delhey and Newton 2005; Delhey et al. 2011; Knack and Keefer 1997; Zak and Knack 2001).

Both surveys include a measure of trust that is identical to the idea of generalized trust presented under section 2. Thus, a generalized level of trust is constructed by aggregating the level of trust for each individual (Bauer and Freitag 2018; Bergh and Bjørnskov 2014; Knack and Keefer 1997; Zak and Knack 2001). Answers are gathered from respondents by asking the question, "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" The respondents which answered "most people can be trusted" were coded as one, while those who said, "You need to be very careful in dealing with people" were coded as zero. When aggregating the numbers this represents the percentage of the population that trusts according to the idea of generalized trust.

Surveys from most low-income countries under sampled the illiterate and rural population while oversampling their counterparts. The WVS and EVS dataset corrects for this by providing weighted and unweighted results. Weighted data also corrects for obvious deviations from national population measures where deviations are statistically significant from what would be expected (Inglehart et al. 2000). As a result, we will use the recommended weighted data. The measure of generalized trust will be the principal dependent variable of this paper following the methodology of existing literature on trust.

Figure III World map according to the level of trust as an average for all surveys

It could be argued that the question itself is difficult to answer given the vagueness of whom to trust specifically. "Most people" is a very broad expression leading itself to ambiguity. Moreover, believing that most people can be trusted is uncharacteristic because we need substantial evidence of how trustworthy someone is before we can trust them (Gambetta 1988; Hardin 2004; Uslaner 2012: 5). Despite this criticism numerous studies have shown that most people are able to provide unambiguous answers because they perceive the question as a measure of trust of people in general and strangers (Bauer and Freitag 2018; Bjørnskov 2007; Uslaner 2018). Additionally, the wallet-drop experiment illustrates how well the trust measure in general correlates with the return rates (Knack and Keefer 1997). In general most respondents do not find the question difficult and answer it unequivocally, as only approximately five percent of respondents refrain from answering (Nannestad 2008). Furthermore, in-depth interviews show that the simple question measures respondents trust in strangers (Uslaner 2002: 17).

Evidence also indicates that the simple general trust question predicts and explains observed trusting behaviour in trust experiments. Specifically, the experiments suggest that the respondents' answers to the question correlates with behaviour in trust games, public goods games and ultimatum games (Cox et al. 2009; Ostrom and Ahn 2009; Wilson 2018). This has also been tested specifically empirically and with results indicating that people seem to understand the question uniformly and as intended (Delhey et al. 2011).

3.2.2 Independent Variable

For our independent variable as well as our controls we use data from the QoG dataset from 2017 which is based on data adapted from the OECD, the World Bank, and IMF databanks. Government size has been measured in several different ways in previous literature: through marginal tax rates, effective tax rates, overall budget and other expenditure measures as well as access to welfare programs and what they include (Berggren and Jordahl 2006; Bergh and Bjørnskov 2014; Kumlin and Rothstein 2005; Yamamura 2012).

The first variable we use to measure government size is government final consumption expenditure sourced from the UN national accounts database and available in the QoG dataset. Government final consumption measures the expenditure on goods and services including social transfers that directly benefit the population and is calculated as a percentage of GDP. The data is available from 1970 to 2014 with an average N of 173, over an average period of 39 years. This variable covers most of our data, only missing for 4 out 291 observations. Furthermore, it covers the relevant aspects of size of government and excludes military expenditure and other things that are less tangible for the average citizen and which we would not expect to impact the level of trust

The second proxy for size of government that we use is the variable: "Size of government: expenditures, taxes and enterprises". Which contains data from 1970-2014 for 160 countries with a mean of 60 countries. Through 1970 to 2000 it was released every five years, which covers the period for our WVS and matches the years for the waves. The variable is an index that is constructed based on an evaluation of four criteria which are government consumption, transfers and subsidies, government enterprise and investment, as well as top marginal tax rate. The index ranges from 0-10. Where 0 corresponds to "large general government consumption", "large transfer sector", "many government enterprises", and "high marginal tax rates and low-income thresholds". A 10 represents a relatively speaking small government size (Gwartney et al. 2016). Due to that the index also uses commas up to two decimals we will transform the index by first multiplying by ten and then subtracting by 100 and take the absolute value of the sum. Thus, our results will range from 0 to 100 with 100 representing the large government size. This is due to that signs and correlations will be more easily interpretable as otherwise all correlations would in practice be in the opposite direction of what one would intuitively expect.

The third variable that we use to measure the size of government is the variable: "Tax Revenue, percent of GDP". The variable stems from the World Bank –World Development

Indicators ranging from 1990 to 2013 in 160 countries. As a result, it would apply for all waves but the first wave from 1981-1984. Certain transfers such as most social security contributions, penalties and fines are excluded. Erroneously collected tax revenues and refunds are considered a negative revenue (World Bank 2016).

3.2.3 Control Variables

With respect to control variables, we have chosen to include an array of variables that may be somewhat unalike some recent previous studies whom have followed a more minimalistic approach (Bergh and Bjørnskov 2014; Bjørnskov 2007; Nannestad 2008). We feel that a panel-data approach allows for a larger number of controls to be included, variables that have all had a statistically significant correlation in previous studies. The choice of extending the amount of controls further than Bergh and Bjørnskov (2014) or Nannestad (2008) is also due to data availability. When it comes to trust and size of government, the greater the amount of included controls, the more likely is that the exclusion restriction assumption will hold (Barone and Mocetti 2016).

Our first control variable is education and has its basis in theory and previous studies (Knack and Keefer 1997; Zak and Knack 2001). Putnam (2000) as well as Coleman (1988) argue for a reverse causality where increased trust would lead to larger expenditure on welfare, this would be in line with the findings in Bergh and Bjørnskov (2014). Bjørnskov (2007) did not find education to be a significant predictor for trust. However, this was only for a cross-country comparison and did not take into account actual changes in trust. There is also a risk that GDP correlates strongly with the level of education expenditure and thus including both variables could obscure any significant effect, which is why education will only be used for testing hypothesis two. We will include the average schooling years for both male and female as the primary control for education. The variable is gathered from the Educational Attainment Dataset (Barro and Lee 2011). The data ranges from 1950-2010 with a max of 147 countries with average of 25. However, by 1980 a total of 125 countries are covered. With a constant number of 147 countries from 1985 onwards. We expect education to positively and significantly correlate with generalized trust.

Our second control is income inequality. The “aversion to heterogeneity” theory established by Alesina and La Ferrara (2002) argues that it is easier to trust people who are similar to yourself. Thus, income inequality is also a source of diversity. However, it also has basis in the idea that trust is shaped by the “winners and losers” in society. Given that trust and inequality has shown a significant correlation in previous studies (Barone and Mocetti 2016;

Kumlin et al. 2017; Leigh 2006; Uslaner and Brown 2005) We control for income inequality by taking the amount of wealth held by the top ten percent in a country, the variable is available from the QoG dataset and covers the years 1981-2013, with an average N of 37, a max N of 156 and an average time period of eight years. The inclusion of this variable will only be done for testing hypothesis two, as this is one of the main mechanisms that we expect size of government can impact trust, we would expect government size to negatively correlate with inequality.

Our third control variable is long-term unemployment. As unemployment support has shown to have a statistically significant correlation with trust. However, due to a lack of appropriate data we instead use the change in long-term unemployment. A literature review from 2018 show how unemployment negatively affects trust in government (Bauer and Freitag 2018) and how generalized trust is shaped by labour market vulnerability and social policy (Kevins 2018). Given that unemployment benefits are only relevant when an individual is unemployed, we would expect long-term unemployment to work as a substitute for welfare coverage. The data is sourced from the QoG dataset which in turn has adapted the measurements from the World Bank's World Development Indicators (World Bank 2017). The long-term unemployment is measured as the percentage of total unemployment. The data spans from 1980 till 2014 and covers 110 countries. Specifically, this variable refers to the number of people with continuous periods of unemployment of a year or longer.

Our second and third measure for unemployment are regular unemployment levels and unemployment coverage, the latter which we use only on a subsample of only OECD-countries. The unemployment variable is the change in percentage of unemployed of total labour force. The data is available for 1991 to 2014 with a max N of 172, a mean N of 167, over a time period of 23 years. Our data for unemployment coverage covers a max of from the period 1970 to 201, with an average of 22. A limitation in the data set is that it covers exclusively OECD countries (Scruggs et al. 2014). The unemployment coverage variable is constructed by measuring the amount of people in percentage of the labour force that are insured. The data is collected from respective national statistical agency. The duration variable is constructed by takin the weeks of benefit entitlement excluding times of means tested assistance with the same methodology as for coverage (Scruggs et al. 2014).

The next factor we control for is corruption. Given the negative effects of corruption on economic equality, degradation of quality of institution, limiting growth and hampering of economic activities in general (Mauro 1995; Shleifer and Vishny 1993) as well as the established relationship between trust and corruption (Graeff and Svendsen 2013; Porta et al.

1996; Rothstein 1998; Rothstein and Uslaner 2005; Rothstein 2005, 2011; Uslaner 2002, 2004; You 2018). Though, a study from 2012 corruption questions the direction of causality (Graeff and Svendsen 2013) there is strong evidence for that there is a significant relationship that is worth controlling for. This paper will control for corruption by including the Bayesian Corruption Indicator from the QoG dataset (Standaert 2015). The measure is an index variable between 0 and 100; wherein, a higher index number corresponds to a higher level of corruption. The index was created from individual survey data where zero corresponds to the lowest possible level of corruption and one to the highest one. The variable spans from 1984 to 2014 for 198 countries. We expect the correlation between trust and corruption to be significantly negative. The use of corruption as a control is used for all models.

Our next control aims to control various forms of ethnic and religious differences. Several studies have focused on the effect of socio-economic heterogeneity on trust; especially ethnic, religious and linguistic differences (Alesina et al. 1999; Alesina and La Ferrara 2002; Bjørnskov 2006; Dinesen and Sønderskov 2017; Leigh 2006; Uslaner 2012; Wilkes and Wu 2018). The literature is in agreement that in general conclusion a more heterogeneous societies is less likely to trust others. Due to this link between heterogeneity and trust, we will control for heterogeneity by including a measure for the stock if migrant, meaning the percentage of the population that has migrated to the country in question. The variable is measured by counting foreign-born individuals as a percentage of the total population. It has data covering all waves with an N of 196, from 1960 to 2010. It is adapted from the QoG dataset which in turn has adapted the variable from the world development indicators.

We also control for the degree of globalization. The inclusion of a globalization control variable is based on the impact that globalization and political institutions have on generalized trust. A recent paper argues for that globalization has made parts of the population more mistrusting as a whole (Inglehart and Norris 2016), and there is evidence for that globalization creates winners and losers (Fukuyama 2001). We therefore feel it is sensible to control for the level of globalization.

The globalization variable is from the QoG dataset that measures the level of globalization as an index ranging from 0 to 100 with 100 representing a higher level of globalization (Gygli et al. 2018). The variable is a weighted average of three separate variables from the same dataset: economic globalization, social globalization and political globalization. Wherein most weight has been given to economic globalization followed by social globalization and lastly political globalization. Where the social globalization variable is based on three indicators: personal contacts (such as telephone traffic and tourism), information flows

(e.g. number of internet users) and cultural proximity (e.g. number of IKEA warehouses per capita.) The second variable in the composite index is economic globalization. This is measured by flows of trade and investments and by trade and capital barriers such as tariffs. The third part that the index accounts for is political globalization. This is based on the number of embassies and commissions in a country, number of international organizations that the country is a part of, amount of UN peace missions the country has partaken in and lastly, the number of international treaties the country has signed since 1945. The data is available from 1970-2013 with an average of 162, with a maximum of 187. We expect globalization to negatively correlate with generalized trust.

We also control for perceived happiness and well-being. The link between well-being and trust has been subject to analysis in previous literature as pointed out by Jen et al (2010) under section 2.2. As a result of previous studies incorporating well-being as a control, it seems justified to do so here as well. This paper will control for well-being by using the WVS and the EVS variables on self-reported well-being of individuals. Particularly, the subjective measure of happiness that asks: "Taking all things together, would you say you are: Not at all happy, not every happy, rather happy or very happy?" the answers are then aggregated for the country as a whole, with the variable ranging from 1 to 4 with up to five decimals. This specific variable is available for 105 countries from 1981 to 2014. Answers and availability overlap with the dependent variable due to being from the same source, and are measured in the same way as the dependent variable is. Due to this variable being a limited variable from 1 to 4, an increase by one unit is a drastic change in the level of happiness and coefficients will therefore be disproportionately large but do not impact our results.

Given the difference in trust levels between generations as well as the hypothesized decline in trust for younger generations, and the theory that the baseline of trust is formed at a young age, we control for population share below the age of 15 (Bjørnskov 2007; Putnam 2001; Uslaner 2008). This will provide us with a measure of the younger population which is hypothesized to differ significantly from older generations in the level of trust. While it is possible that the interpretation of the variable itself could be difficult due to that younger generations can be both more and less trusting, this is of less relevance as we do not investigate the variable but want to control for the variation that is attached to it.

Table I[4] Summary of Descriptive Statistics

VARIABLES	Obs	Mean	Std.Dev.	Min	Max	Min. Year	Max. Year	N	$\bar{N}$	$\bar{T}$
Trust	291	28.791	15.882	3.167	76.123	1981	2014	105	10	3
trust_c	135	-1.287	8.758	-54.733[5]	17.776	1981	2014			
unna_ggfce	129	16.508	4.732	4.991	26.497	1970	2014	201	173	39
unna_c	129	.535	2.915	-11.594	12.251	1970	2014			
govsize	269	4.193	1.512	1.229	8.373	1970	2014	160	60	17
govsize_c.	287	16.585	4.816	4.543	33.374	1970	2014	201	173	39
wdi_taxrev	188	17.087	7.271	.832	57.539	1990	2013	160	90	14
wdi_imigs	282	7.310	10.151	0.033	73.94	1960	2010	196	34	9
education	263	8.507	2.486	1.155	13.424	1950	2010	147	25	10
wdi_incsh10h	190	29.669	6.979	20.424	51.26	1981	2013	156	37	8
bci_c	288	42.196	13.621	14.757	65.561	1984	2014	198	162	25
dr_ig	286	63.331	15.509	27.941	92.18	1970	2013	187	162	38
wvs_hap	290	3.172	0.263	1.872	3.613	1981	2014	105	10	3
wdi_pop14	286	24.63	8.675	13.123	49.391	1960	2014	189	154	45

Full information for all variables are presented in appendix A. As we can see from the descriptive statistics all variables except the tertiary variable for government size, tax revenue, cover the whole period from the first to last wave. It also is evident from the statistic that data seems to be clustered due that no variable except trust_c has a standard deviation higher than the mean. While we see no issue with the maximum and minimum for trust, as they represent country specific values, the change in trust measured in percentage points contains one outlier – Iran. The change in trust in Iran from wave four to wave five would reflect changes during the year 2000-2005 in Iran. Given the instability at the time in Iran, and the inclusion of other countries that have also experienced relatively large or small drops we choose to not exclude Iran due to risking selection bias as the drop might be due to justifiable circumstances. Furthermore, when we run our main models for hypothesis one and two we see no difference in the significance of our independent or dependent variables or explanatory power.

[4] The variable code will be used throughout the paper; further description on each variable is seen in Table III in appendix A.

[5] Excluding Iran, the minimum was 19 percentage points, reflecting a roughly equal maximum and minimum measured as the distance from the mean.

Table II Missing Variables

VARIABLES	Missing	Total	Percent Missing
trust	0	291	0.00
unna_ggfc	4	291	1.37
unna_c	4	291	1.37
govsize	22	291	7.56
wdi_taxre	103	291	35.40
education	28	291	9.62
wdi_unemplt	107	291	36.77
wdi_incsh10h	101	291	34.71
bci_bci	3	291	1.03
dr_ig	5	291	1.72
wvs_hap	1	291	0.34
wdi_imigs	7	291	2.41

When we look at what variables are missing, data presence is generally up to 97 percent of the countries, the exception being the second and tertiary measure for government, as well as the measurements for controlling our proposed trust creating mechanisms, however even in this case we still retain 63 percent of data at the very least.

Looking at the correlation between variables we find that trust correlates as predicted by theory and our hypothesis with each variable. Furthermore, except for our variables size of government, only corruption correlates and attitudes toward globalization correlate above 0.5 in absolute values with generalized trust. For our controls we see that population share below 14 with education level, education and income inequality correlate above 0.5, while only corruption and globalization, as well as globalization and population share up to 14 correlate above the 60 percent level. Given that education and income inequality are only used to test hypothesis two, care needs to be taken when interpreting the coefficients. Though the globalization index and the population share up to 14 are used for most models, coefficients of these variables are not important to this paper.

Table III Correlation between Variables

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) trust	1.0000															
(2) govsize	0.4762	1.0000														
(3) unna_ggfce	0.4569	0.6874	1.0000													
(4) unna_ln	0.4001	0.6430	0.9854	1.0000												
(5) wdi_taxrev	0.1290	0.2013	0.3313	0.3328	1.0000											
(6) wdi_unemplt	-0.2259	0.2183	0.1647	0.2273	0.0037	1.0000										
(7) ltemp_c	-0.0505	-0.0690	-0.0695	-0.1170	-0.2093	-0.0791	1.0000									
(8) education	0.4382	0.2767	0.4118	0.4530	0.0402	0.3079	-0.0065	1.0000								
(9) edu_c	-0.1855	-0.0933	-0.1642	-0.1795	-0.1387	-0.0825	0.2095	-0.3384	1.0000							
(10) wdi_incsh10h	-0.4416	-0.3716	-0.3243	-0.3121	-0.1362	-0.2967	-0.0389	-0.5152	0.2020	1.0000						
(11) wdi_imigs	0.1931	0.0687	0.2664	0.2576	0.0565	-0.0408	0.2108	0.2364	-0.0965	-0.2191	1.0000					
(12) bci_bci	-0.7538	-0.4942	-0.4409	-0.4065	-0.2261	0.1581	0.0877	-0.3498	0.2311	0.4186	-0.3637	1.0000				
(13) bci_c	-0.0309	0.1309	0.2489	0.2570	0.0205	0.2077	0.2165	0.0066	0.0958	-0.0285	-0.0402	0.0306	1.0000			
(14) dr_ig	0.5526	0.5378	0.5425	0.5515	0.2127	0.2629	-0.1360	0.5874	-0.2662	-0.5962	0.2322	-0.7065	0.0781	1.0000		
(15) wvs_hap	0.3484	0.0687	0.0573	0.0233	-0.0076	-0.5470	-0.0468	-0.0231	-0.0535	0.1580	0.0592	-0.4403	-0.1073	0.1564	1.0000	
(16) wdi_pop14	-0.2670	-0.3192	-0.2971	-0.3641	-0.0559	-0.5039	0.2240	-0.6488	0.2533	0.5476	0.1887	0.2611	-0.1277	-0.6574	0.1926	1.0000

3.3 Model Specification

To specify our model there are two main questions to answer, the first being whether a dynamic or static model best describes the data generating process (DGP), the second whether a model potential static model would use a fixed effects or random effects model. Hence our model specification includes three main chapters: whether our variables suffer from unit roots or cross dependence, choosing fixed effects or random effects for the static model, followed by comparing our static model versus or dynamic model. To check whether unit roots are present we use the Fisher test and use the Pesaran 2004 and 2015 cross-dependence test to check for cross-sectional dependency. To check whether a fixed effects or random effects model is correct we use the Hausman test. To choose between a dynamic or static model we check the significance and explanatory variables for two different models as well as running our dependent variable on our independent and a lagged dependent variable only.

3.3.1 Panel Unit Roots and Cross Dependency

We test for unit root due to that if a unit-root exists which is not cointegrated, this would lead to spurious results. Most of this literature focuses on the case where T is large and the number of cross-sectional units, N, is small or large T and large N. Which allows for more explicit treatment of unit roots and cointegration. That type of panel data also allows for larger sample that could improve efficiency and alleviate multicollinearity that allows for more heterogeneity than micro panels, identifying unobserved factors affecting all units and more comprehensive dynamic models.

In this paper due to the nature of the WVS and EVS, a micro panel is used implying a small T and large N. This hinders estimating a different time series model for each country and makes the traditional time-series techniques problematic. According to Enders (2008) there is substantial disagreement about the underlying asymptotic theory of various time series techniques applied to panel data. However, Verbeek (2008) notes that applying time series techniques are accepted if the series are of sufficient length and each time series is considered.

Hsiao (2014 pp. 392) argues that in the case of a large N and small T it only makes sense to use unit root tests if the cross-sectional units have a large enough fraction that rejects the null under heterogeneity and is informative. However, the T has to be large enough in order to identify the section of the sample where the null hypothesis is rejected (Hsiao 2014). Correspondingly, Pesaran (2012) argues that in a heterogeneous panel with a large N and small T, one can only develop sufficient unit root test that are informative in “some average sense”.

Specifically, only being able to indicate whether the null can be rejected for a substantial fraction of the units in the panel. In order to identify this fraction, the T have to be large enough (Pesaran 2012). Thus, the literature on time-series panel data suggests that while there are econometric techniques for examining the time-series aspect of panel data they should be taken lightly and that unit-root tests hold low power (B. H. Baltagi and Kao 2001).

Maddala and Wu (1999) compares various panel data unit root test and conclude that averaging the Augmented Dickey-Fuller (ADF) statistics, like other tests, is not the most efficient method. They propose that the Fisher test is a better test than the alternatives such as Levin-Lin and Im-Pesaran-Shin tests when dealing with micro panels (Maddala and Wu 1999). To establish the properties of our variables and models, unit root tests are needed. As a result, we conduct the Fisher test, which does not require a balanced panel. The test also allows for different lag lengths in the individual ADF regression. The test itself assumes that all series are non-stationary under the null hypothesis against the alternative that at least one series in the panel is stationary.

However, one has to determine the number of lags and whether a trend should be included (to capture any remaining serial correlation). It is not obvious how it has to be determined which leads to ambiguity in the selection process (Verbeek, 2008). For time-series data it is usually derived by performing ADF tests for various lag values. It is possible to estimate optimal lag length by looking at information criteria such as BIC or AIC.

Table IV Unit Root Results for the Fisher ADF Test

	Fisher - ADF test -
VARIABLES	ADF(Fisher chi-square)**
Trust	0.0000
trust Ln	0.0000
unna_ggfce	0.0040
unna_Ln	0.0030
unna_c	0.0000
Govsize	0.0005
govsize Ln	0.0065
education	0.6056
edu_c	0.0002
wdi_unemplt	0.6500
wdi_unemplt Ln	0.1010
ltemp_c	0.0000
wdi_incsh10h	0.0074
bci_bci	0.4070
bci_bci Ln	0.5043
bci_c	0.1614
dr_ig	0.0000
wdi_imigs	0.0451
wvs_hap	0.0067
wvs_hap Ln	0.0041
wdi_pop14	0.0000

**Probabilities for Fisher tests are computed using asymptotic chi-square distribution.
Automatic lag length selection based on SIC (also known as BIC):0 for all variables.
Calculated without a trend.

Testing for lag-length, the BIC recommends zero lags for all variables. As can be seen from the data corruption, long-term unemployment, and education all fail to be rejected at zero lags.

To correct for the above, we transform said variables to changes from wave-to-wave. We now reject the null of non-stationarity for all variables except corruption. In the case of corruption however, even when we measure it as change in corruption our P-value is only 0.16. However, we feel confident that this is a non-issue for two main reasons. The first being the over-tendency to fail to reject with a low T, which is due to that the average observation is less than three would imply a very short T. The second being that the test drops an additional 30 observations due to a lack of observations in those specific time-series. This leads us to conclude that the test lacks enough power in this specific case. We thus feel that there is no tangible issue with unit-roots in our data given the short T period and the low power of the unit-root test for panel data with small T.

An additional concern of the data can be cross-sectional dependence. When pooling time series of various countries it is possible that countries could be affected by some common

factor – such as global cycles or a shock in one country that affects several other countries (B. H. Baltagi and Pesaran 2007). The presence of cross-sectional dependence could lead to misleading inference and inconsistent estimators for panel estimations using a fixed effects or random effects model (Bailey et al. 2016; Chudik and Pesaran 2013). Formally cross-sectional dependence can be written as (Pesaran 2007; Verbeek 2008: 415):

$$y_{i,t} = \delta y_{i,t-1} + \beta_1 x_{i,t} + \beta_2 z_{it} + \alpha_i + u_{i,t},$$
$$u_{i,t} = \lambda_i f_t + \varepsilon_{i,t},$$
$$x_{i,t} = \lambda_i f_t + \eta_{i,t} \quad (4)$$

Where f_t represents a serially uncorrelated unobserved common factor and where the coefficients λ_i represent factor loadings. We use the test developed by Pesaran (2004) for testing strong cross-section dependence of errors in linear panel data model even for dynamic panels. The test includes considerations for small sample properties such as large N and small T and can be applied to both balanced and unbalanced panels. We also use the approach by Pesaran (2016) to test for weak cross-sectional dependence. The null hypothesis for the strong cross-sectional is that the variable is independent, while the null for the weak dependent is that variablels are weakly dependent. The weakly dependent cross-sectional test is more appropriate in the case of erratic and non-systematic common factors, especially given the strong assumptions required for the strong cross-sectional dependency test and the tendency for the strong test to over-reject for panels with a small T (Pesaran 2015).

Table V Cross-sectional Dependence, Strong and Weak Dependence

	Strong CD Test – Pesaran (2004)				Weakly CD Test – Pesaran (2015)	
VARIABLES	CD-test	p-value	Mean p	Mean abs (p)	CD-test	p-value
trust H¹ H²	5.067	0.000	0.02	0.10	33.618	0.000
unna_ggfce H¹ H²	4.734	0.000	0.01	0.10	43.146	0.000
bci_c H¹ H²	8.303	0.000	0.03	0.12	4.118	0.000
edu_c H²	8.217	0.000	0.02	0.07	15.865	0.000
ltemp_c H²	4.884	0.000	0.01	0.03	4.474	0.000
dr_ig H¹ H²	49.062	0.000	0.14	0.15	47.741	0.000
wdi_imigs H¹ H²	3.805	0.000	0.01	0.13	40.901	0.000
wvs_hap H¹ H²	14.956	0.000	0.04	0.10	45.496	0.000
wdi_pop14 H¹ H²	47.279	0.000	0.14	0.14	33.738	0.000
wdi_incsh10h H²	2.049	0.040	0.00	0.03	40.023	0.000
Residual 1	24.871	0.000	0.07	0.12	29.978	0.000
Residual 2	1.006	0.315	0.00	0.00	15.233	0.000

The results from the cross-sectional dependence test are presented in table V. As can be seen we reject the null of independent variables for the strong cross-sectional dependence test,

however we also reject the null for the weak cross-sectional dependence test. For the weak cross-sectional test to be accurate it is required that the common factor is below 0.5, implying a dependence of 50 percent or more (Pesaran 2015). To further investigate this we calculate the residuals for our model for hypothesis one and two, and run the strong and weak cross-sectional dependence on the residuals for both models.

As can be seen we now fail to reject the null of the strong for the residuals of model one, and still reject the null of the weak cross-sectional dependent. Though we reject the null for the strong dependence for model one, we also still reject model for weak cross-sectional dependence. We thereby conclude that our models do not suffer from weak cross-sectional dependency. Given the stringent requirements for the strong, it is likely to over-reject and should not constitute an issue for small T panels (Pesaran 2015).

This would also intuitively make sense given the values tested, as we see little reason for trust, education levels, corruption, population share, government size to in general being cross-dependent, while there might be regional similarities this in itself does not imply co-dependency.

3.3.2 Fixed Effects and Random Effects

To be able to decide whether a dynamic or static model best represents our DGP we first need to decide on the correct static specification to compare to our dynamic model. Determining the appropriate model for analysing panel data depends on context, the nature of the data, and what questions are asked. Pooled OLS, fixed effects and random effects models are most commonly applied in a static setting. A potential problem with these type of models is heteroscedasticity, serial correlation as well as the fact that endogeneity of some explanatory variables are not considered due to the assumptions employed. The fixed effects model is a simple linear regression model where $i = 1, \dots N, \quad t = 1, \dots, T$ that include individual-specific intercept constant α_i:

$$y_{i,t} = \alpha_i + x'_{i,t}\beta + u_{i,t}\,, \quad u_{i,t} \sim IID(0, \sigma_u^2) \tag{5}$$

It is assumed that all $x_{i,t}$ are independent of all $u_{i,t}$. Where α_i are fixed unknown constants that captures all (un)observable time-invariant differences across individuals. With $x_{i,t}$ being a $k \times 1$ vector of exogenous variables. Principally, the fixed effects model examines differences within individuals and the approach is conditional on the values for α_i. In contrast the random effects model would be formalized as:

$$y_{i,t} = \beta_0 + \alpha_i + x'_{i,t}\beta + u_{i,t}\,, \quad u_{i,t} \sim IID(0, \sigma_u^2) \quad \alpha_i \sim IID(0, \sigma_\alpha^2) \tag{6}$$

For the random effects model to be consistent the assumption is that α_i are random individual specific error terms and independent and identically distributed (IID). Meaning estimates are not conditional upon the individual α_i but examines population characteristics. It is assumed that $u_{i,t}$ and α_i are mutually independent and independent of $x_{i,t}$ (Verbeek 2008: 381).

Both models are advantageous depending on the true DGP. The fixed effects model would imply that the identification of individuals is important. While the random effects model assumes the individual effect as random and statistical inference comes from population characteristics that were randomly drawn. Furthermore, a random effects model would be appropriate if we are drawing N individuals randomly from a large population.

One significant difference is the distinction between the requirement of exogeneity and endogeneity of variables. While it is possible that fixed effects models are consistent with endogenous variables and individual intercepts (Mundlak 1978), the random effects model requires exogenous variables. Hausman (1978) created a test to decide on the appropriate model, where respective estimators from both models are compared. However, though the Hausman test can be useful, it is in general not possible to test for exogeneity and interpretation of results need to be done with care. If the Hausman test shows a significant result and we reject the null the random effects model would be inconsistent and as such in order to be able to compare the model with the dynamic model the fixed effects model should be selected (Hausman 1978).

Conducting the Hausman test shows that we reject the null of no systematic difference and accept our alternative hypothesis.[6] Accordingly we adopt a fixed effects model for our static specification. The model of trust and government in a static setting is therefore represented as:

$$y_{i,t} = \alpha_i + x'_{i,t}\beta + u_{i,t}, \qquad i = 1, \dots N, \quad t = 1, \dots, T \tag{7}$$

Here $y_{i,t}$ represents trust, $x_{i,t}$ represents a vector of covariates of government size, and our control variables. The vector α_i represents fixed unknown country specific constants that capture all unobservable time-invariant differences across countries. Due to the presence of country specific effects, we drop Nordic and former communist dummies as they are controlled for by the individual intercept.

[6] See appendix B.

3.3.3 Dynamic Contra Static

Using a dynamic model approach is characterized by the use of a dynamic effect by adding a lagged dependent variable to the explanatory variables. Dynamic models can be theoretically preferable to a static model when the subject matter in question have a dynamic component to it. As a dynamic process model with a static approach would be misspecified and would invalidate statistical inference. Doing so would lead to results that are subject to potential bias when the parameters are heterogeneous across countries (Im et al. 2003; Pesaran and Smith 1995; Pesaran et al. 1999). However, whether to apply a static or dynamic model depends on the DGP. The specification for a dynamic model looks as follows:

$$y_{i,t} = \delta y_{i,t-1} + x'_{i,t}\beta + \alpha_i + u_{i,t}, \qquad u_{i,t} \sim IID(0, \sigma_u^2) \quad \alpha_i \sim IID(0, \sigma_\alpha^2) \tag{8}$$

Where α_i and $u_{i,t}$ are independent of each other. The dynamic relationship is characterized by autocorrelation and individual effects. The lagged dependent variable will also remove any autocorrelation. This setting involves using either the first difference or the system GMM both overcome problems of endogeneity in a similar manner to a two state least squares model (Arellano and Bond 1991; Blundell and Bond 1998). We will use the system GMM. The reasoning for using this and not the alternative difference GMM is due to the asymptotic properties of being better able to estimate with small T and large N and with panels that may contain fixed effects and idiosyncratic errors that are heteroskedastic and correlated within but not across individuals. This can dramatically improve efficiency. The difference between the two estimators, is that a difference GMM utilize moment conditions from the estimated first differences of the errors. While a system GMM uses moment conditions as above but also from the levels of residuals. Additionally, it uses forward orthogonal deviations which preservers sample size in panels with gaps (Roodman 2006).

Differentiating between a dynamic and static context is challenging as there is no prescribed test for whether the data is dynamic or static. It is a conceptual enquiry that asks whether history matters; whether the past matters to the current values. Thus, it is theory driven. A static approach would assume that trust does not have persistence to it. Meaning that time does not play an essential role in the creation and levels of trust. Various drastic and dramatic events such as terrorism, war and other conflicts have a clear effect on human beliefs and values and can impact trust quickly. Hence, it could be possible that today's trust levels to a certain degree would be affected by yesterday's trust levels, but there is also an argument to be made for that trust can be created and eroded quickly.

One issue would be that due to the presence of six waves, the T dimension might not be adequate in order to include an autoregressive term of the dependent variable, trust. However, the Arellano and Bond GMM estimator allows for statistical inference even with a low T. As a result, we examine a dynamic panel approach but also assess a static model in order to see whether it emulates the DGP better. Applying the differenced GMM in lieu of adequate instrumental variables allows us to examine the short-term and long-term relationships between trust and government size. The dynamic linear model would be formalized as:

$$y_{i,t} = \delta y_{i,t-1} + \beta_1 x_{i,t} + \beta_2 z_{it} + \alpha_i + u_{i,t}, \qquad i = 1, \dots N, \quad t = 1, \dots, T,$$
$$u_{i,t} = \gamma_i + \varepsilon_{i,t} \tag{9}$$

Wherein $y_{i,t}$ would signify the trust variable. $x_{i,t}$ represents a $k \times 1$ vector of strictly exogenous covariates that does not depend on current nor past $\varepsilon_{i,t}$. z_{it} represents a vector of predetermined covariates, these could be correlated with γ_i. This vector usually includes the lag of $y_{i,t}$ but for pedagogical reasons the term is extracted. Government size would also be another variable that would be included in this vector. γ_i are unobserved individual-level effects. $\varepsilon_{i,t}$ are the observation-specific errors.

Roodman (2006) states that the system GMM estimator is designed for data that has a low T value but a comparatively high N as well as independent variables that are not strictly exogenous. This makes it a good fit for the six waves and 105 countries used in this study. To test whether a dynamic model or static model best describe the underlying DGP we will examine regression outputs. To do this we run the respective model for hypothesis one and two with and without a lagged dependent variable. We also run a model including only our dependent and independent with a lagged variable.

Table VI Dynamic versus Static

VARIABLES	(DYN 1) TRUST	(FE 2) TRUST	(DYN 3) TRUST	(FE 4) TRUST
trust $_{t-1}$	0.297		0.579	
	(0.504)		(0.479)	
unna_ggfce	3.091	0.076	0.794	0.444
	(2.990)	(0.246)	(1.985)	(0.457)
edu_c			-0.234	-0.018
			(0.468)	(0.117)
wdi_unemplt			0.148	0.085
			(0.125)	(0.081)
wdi_incsh10h			-2.859	0.604
			(3.103)	(0.598)
bci_c	-5.576	0.790	-4.691	-0.144
	(3.816)	(0.510)	(3.033)	(0.495)
dr_ig	-0.346	0.041	-0.515	0.138
	(0.728)	(0.181)	(0.920)	(0.318)
wdi_imigs	0.441	-0.496	0.602	-1.922***
	(2.954)	(0.409)	(1.254)	(0.331)
wvs_hap	3.726	-2.329	29.878	-23.011***
	(36.400)	(5.497)	(29.054)	(6.604)
wdi_pop14	-0.571	0.572	1.506	-0.259
	(0.854)	(0.595)	(2.205)	(0.706)
Observations	134	260	42	90
Number of countries	66	99	28	54

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

When we examine the dynamic model (1) with the dependent variable, trust, being lagged once and control for corruption, migrant stock, globalization, subjective happiness and population age; the lagged measure of trust is not significant at the five percent. We do the same for (3) and (4) which include measures for income inequality, education and unemployment. The dynamic model lagged dependent variable is not significant at the five percent level.

Based on this information, results provide a mixed conclusion. Naturally the dynamic models would have increased explanatory power due to the addition of an extra variable, especially a lagged one, however the lack of significance indicates that the addition of the lagged variable lacks explanatory. Therefore, this paper will adopt a static fixed effects model in analysing the relationship between trust and government size and the hypotheses encompassed. Though it is possible that the insignificance of the lagged dependent model might very well be skewed by a low T and the amount of observations lost to by creating a lagged dependent, we will therefore also run dynamic models as a robustness test.[7]

[7] Presented in appendix C.

3.3.4 Granger Causality

To test whether there exists statistical causality between government size and trust we will use the Granger causality test. The test examines the correlation of variables with the histories of the variables in mind. The serial correlation between variables are eliminated by regressing the dependent variable on its own lagged values Y_{t-1} and the lagged values of another variable X_{t-1} (Granger 1969). Specifically, it can be said that variable X is "Granger causing" Y if Y is better predicted by using the past values of X than by not including it. In other words, the goal is to establish whether the values of the dependent variable can be explained by the past values of the independent variable. If the independent explains the dependent, then it is said to be a unidirectional relationship and if they both explain each other then it is said to be bi-directional or having a feedback relationship (Verbeek 2008:.353).

We implement VAR models in order to examine the relationship between trust and government size. Variables in a VAR are typically treated as endogenous and estimation is based on a GMM framework (Holtz-Eakin et al. 1988; Sims 1980). Due to the requirement in degrees of freedom the Granger non-causality test of $T_i > 5 + 2\text{K}$ we cannot estimate the causality using a non-VAR.

When testing for Granger causality with data that include non-stationary and stationary series, results risk being erroneous. The Granger causality test will provide incorrect results since estimates will not follow normal asymptotic chi-square distribution under the null (Lütkepohl 2005). However, as shown under 3.3.1 we have no unit roots present. And are able to proceed without further adjustments. Therefore, we adopt a VAR (p) model with our two variables of interest, trust (Y) and government (X) size. A VAR (1) would take the standard form of:

$$Y_t = \delta_1 + \theta_{11} Y_{t-1} + \theta_{12} X_{t-1} + \varepsilon_{1t} \tag{10}$$

$$X_t = \delta_2 + \theta_{21} Y_{t-1} + \theta_{21} X_{t-1} + \varepsilon_{2t} \tag{11}$$

The system can be extended as a VAR (p) model:

$$Z_{i,t} = A_0 + A_1 Z_{i,t-1} + \cdots + A_p Z_{i,t-p} + \varepsilon_{i,t}, \quad i = 1, \dots N, \quad t = 1, \dots, T \tag{12}$$

Wherein, $Z_{i,t}$ is a k-dimensional vector of the combinations of trust (Y) and government size (X), $A_0 + A_1$ are the coefficient k-dimensional vectors and $\varepsilon_{i,t}$ signifies composite error terms independent of past histories.

4 Empirical Results and Analysis

4.1 Hypothesis I

The first step is to test for residuals for our model. We run (1) below and using the Wald test we reject the null of homogenous residuals at the one percent level.[8] Given that all regressions for testing hypothesis one will use models that only change the independent variable and on subsections of our sample, we will use robust standard errors for all regressions run for hypothesis one.

Our first hypothesis was H_1: Size of government correlates positively with the level of generalized trust in society. We will test it by running seven regressions, as well as running our models on five regional subsamples of our data.[9] Further robustness is provided in appendix C testing any significant results for different dependent variables.

Table VII Hypothesis 1

VARIABLES	(1) trust	(2) trust	(3) trust	(4) trust	(5) trust	(6) trust
unna_ln	-1.643					
	(3.807)					
unna_ggfce		0.076				
		(0.246)				
govsize			-0.116			
			(0.614)			
wdi_taxrev				-0.164		
				(0.223)		
wdi_expedu					0.269	
					(0.906)	
wdi_expmilge						0.096
						(0.177)
bci_c	0.776	0.790	0.804	0.941	1.016*	0.914
	(0.504)	(0.510)	(0.542)	(0.633)	(0.572)	(0.622)
dr_ig	0.039	0.041	0.055	0.103	0.132	0.128
	(0.180)	(0.181)	(0.194)	(0.293)	(0.225)	(0.290)
wdi_imigs	-0.473	-0.496	-0.477	-0.656	-0.491	-0.624
	(0.402)	(0.409)	(0.445)	(0.515)	(0.442)	(0.509)
wvs_hap	-2.778	-2.329	-4.912	5.983	-5.931	5.629
	(5.577)	(5.497)	(5.905)	(4.561)	(7.399)	(4.497)
wdi_pop14	0.536	0.572	0.616	0.872	0.944	0.976
	(0.599)	(0.595)	(0.630)	(0.933)	(0.767)	(0.959)
Observations	260	260	241	187	219	184
R-squared	0.063	0.062	0.083	0.068	0.110	0.073
Number of countries	99	99	95	87	86	87

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

As we can see, observations remain fairly stable for all regressions in table VII, with all regressions keeping more than 60 percent of observations, and covering more than 75 percent of countries. If we look more closely, two main observations become obvious. The first and

[8]See appendix A for more.

[9] Specific countries included for subsamples are available in appendix A.

most important is that government does not seem to significantly correlate with generalized trust in any regressions. Similarly, the sign for our government variables point in both directions, again though with no significant results interpretations cannot be done confidently.

Furthermore, the second observation is that variables that we would expect to impact trust significantly do not do so. Results need to be interpreted with care as there is no statistical significant relation for regression and that signs in front of coefficients do not point in the direction we would expect, except for immigrant stock. Especially the change in corruption for (5), which is significant at the ten percent level, impacts trust positively. Directly counter to what we would expect, meaning an increase in the pace of change for corruption increases trust.

When we look at our subsamples, regression (1) and (2) represent Latin America, regression (3) and (4) represent East and Southeast Asia, (5) and (6) represent sub-Saharan Africa, (7) and (8) represent OECD countries and (9) and (10) represent Middle Eastern and North African countries. Dividing our full sample into subsamples helps clarify the picture.

Table VIII Subsamples for Hypothesis I

VARIABLES	(1) trust	(2) trust	(3) trust	(4) trust	(5) trust	(6) trust	(7) trust	(8) trust	(9) trust	(10) trust
unna_ln	-16.327		-11.130		0.473		-0.198		95.299***	
	(17.427)		(6.317)		(8.545)		(5.530)		(15.132)	
unna_ggfce		-1.157		-0.551		0.702		0.158		6.406***
		(1.397)		(0.494)		(0.404)		(0.313)		(0.832)
bci_c	0.530	0.648	0.369	0.290	22.800**	23.442***	0.671	0.673	4.264	3.927
	(1.241)	(1.169)	(0.488)	(0.456)	(8.665)	(6.172)	(0.541)	(0.539)	(2.945)	(3.569)
dr_ig	0.067	0.062	-0.401	-0.438	-2.379**	-2.369***	0.209	0.218	2.246**	2.477***
	(0.311)	(0.302)	(0.282)	(0.303)	(0.809)	(0.747)	(0.186)	(0.185)	(0.856)	(0.827)
wdi_imigs	-3.871	-3.865	3.315***	3.514***	-21.557*	-20.900**	-0.875*	-0.930*	-0.046	0.290
	(2.928)	(3.094)	(0.481)	(0.447)	(11.353)	(7.929)	(0.488)	(0.493)	(0.625)	(0.780)
wvs_hap	-16.543**	-17.923**	-13.978	-16.563	28.844*	36.298**	-19.364***	-18.958***	4.098	5.609
	(6.978)	(6.636)	(10.989)	(11.360)	(14.634)	(12.620)	(5.138)	(5.202)	(2.392)	(3.520)
wdi_pop14	0.196	0.181	-0.753	-0.798	-2.376	-1.768	0.320	0.370	8.020***	7.820***
	(0.662)	(0.688)	(0.618)	(0.658)	(1.775)	(1.860)	(0.637)	(0.611)	(0.764)	(1.065)
Observations	35	35	28	28	20	20	113	113	32	32
R-squared	0.531	0.523	0.652	0.635	0.756	0.782	0.215	0.217	0.816	0.797
Number of countries	13	13	9	9	11	11	35	35	16	16

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

What we can see from the above is that government size does not significantly impact trust except for Middle East and North Africa. However, if we compare (9) and (10) to (1) to (8) we see that for all other regressions wvs_hap is significant for 6 out of 8 regressions with coefficients that are highly impactful. For wvs_hap we see that neither are significant for (9) and (10) while government size is, furthermore especially for (9) we see that a 1 percent increase in government size would imply a 96 percentage point increase in trust, something that makes us highly doubt our results for (9). Similarly, this cast doubt on our result for (10) as it is possible that even with a changed independent the model for Middle East and North

Africa is inconsistent and over-specified. For all other subsamples government size is insignificant. Furthermore, the sign and impact of several control variables are contrary to expectation.

4.2 Hypothesis II

Our second hypothesis was that government size should not impact trust in society when controlling for income inequality, education, and long-term unemployment. We test for heteroscedasticity and again reject the null, and accordingly use robust standard errors. To test hypothesis two, two main regressions will be run on our whole sample size as well on the five subsamples used in hypothesis one. We conclude by running three different measures for unemployment on OECD countries only, the choice being based on data availability and as the only unemployment coverage being available is exclusive to OECD countries.

Table IX Government Size Separated from Proposed Mechanisms

VARIABLES	(1) trust	(2) Trust	(3) trust	(4) trust	(5) trust	(6) trust
unna_ln	5.731					
	(6.640)					
unna_ggfce		0.444				
		(0.457)				
govsize			-0.304			
			(1.198)			
taxrev_c				-0.622***		
				(0.176)		
wdi_expedu					-0.390	
					(1.256)	
wdi_expmil						2.232
						(1.403)
edu_c	-0.021	-0.018	-0.028	-0.218**	-0.021	-0.025
	(0.114)	(0.117)	(0.108)	(0.104)	(0.086)	(0.112)
ltemp_c	0.087	0.085	0.086	0.190***	-0.004	0.073
	(0.080)	(0.081)	(0.081)	(0.070)	(0.067)	(0.076)
wdi_incsh10h	0.606	0.604	0.505	1.779***	0.901**	0.393
	(0.610)	(0.598)	(0.573)	(0.422)	(0.421)	(0.619)
bci_c	-0.121	-0.144	-0.087	-0.654*	0.126	-0.064
	(0.491)	(0.495)	(0.491)	(0.382)	(0.540)	(0.486)
dr_ig	0.104	0.138	-0.015	-0.416	-0.252	0.105
	(0.330)	(0.318)	(0.367)	(0.442)	(0.314)	(0.362)
wdi_imigs	-1.936***	-1.922***	-1.974***	-2.381***	-2.106***	-1.778***
	(0.326)	(0.331)	(0.348)	(0.470)	(0.587)	(0.363)
wvs_hap	-23.727***	-23.011***	-24.719***	-14.315*	-33.503***	-25.126***
	(6.922)	(6.604)	(7.314)	(8.329)	(5.219)	(7.091)
wdi_pop14	-0.313	-0.259	-0.580	-2.478**	-1.174	-0.609
	(0.742)	(0.706)	(0.791)	(1.163)	(0.772)	(0.780)
Observations	90	90	90	74	82	90
R-squared	0.578	0.579	0.575	0.732	0.637	0.584
Number of countries	54	54	54	50	50	54

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

Three main things become clear with the table above. The first is the insignificance of all government size measures except for the change in tax revenue. The second is the relative insignificance of the proposed trust creating mechanisms. The third is the signage of the proposed trust creating mechanisms.

As can be seen from the table above, all but regression (4) show insignificant measures for government size. However, this result provides little new information due to that results achieved in table VII and table IX above, show that government size is insignificant in the majority of cases. In the cases where government size is insignificant we only find proper support in equation (5) for income share. In (4) we see that income share, unemployment and education are all significant. However, so is tax revenue as well, which is contrary to our hypothesis. Furthermore for both (4) and (5) the sign for our proposed trust creating mechanisms are significant in the opposite direction of what we expect. For all other regression our controls for our suggested variables show insignificant results

In regard to control variables, the significant values for population share under the age of 14 as well as the percentage of immigrants in a country are, when significant, in the direction that is expected, that is to say negatively impact generalized trust. However, once again the reported happiness seems to have a too large coefficient as well as the signage of said coefficient being in the opposite direction. However, removing said variable from our equation does not change our results in any specific direction. We again believe that due to the stable nature of happiness and the rather low standard deviation in relation to mean as seen in the descriptive statistics in table V which implies that the coefficient itself should not be trusted, however as we only use it to clarify the impact of size of government and it does not seem to skew our results the impact this has is insignificant.

The next step is to investigate our results for the relevant subsections, two tables are provided. We again use five subsamples, where (1) to (2) represent Latin American countries, (3) and (4) East and Southeast Asia, (5) and (6) represent sub-Saharan Africa, (7) and (8) represent OECD while (9) and (10) represent Middle East and North Africa.

Table X Subsample for Hypothesis II

VARIABLES	(1) trust	(2) trust	(3) trust	(4) trust	(7) trust	(8) trust	(9) trust	(10) trust
unna_ln	-16.743		-12.317		-5.566		-260.560***	
	(18.220)		(15.099)		(8.821)		(20.086)	
edu_c	-0.216*	-0.205*	0.752*	0.961**	0.074	0.105		
	(0.103)	(0.113)	(0.349)	(0.281)	(0.185)	(0.201)		
wdi_incsh10h	0.203	0.212	-1.630	-0.810	-0.781	-0.553	-28.159***	-19.046***
	(0.769)	(0.767)	(0.881)	(1.232)	(0.768)	(0.774)	(1.882)	(2.528)
bci_c	0.501	0.792	9.807***	11.004***	0.035	0.051	-26.923***	-24.505***
	(1.297)	(1.211)	(2.432)	(1.875)	(0.537)	(0.530)	(1.583)	(2.475)
dr_ig	0.019	0.038	-1.119	-1.560**	-0.016	0.032	-12.507***	-7.833***
	(0.353)	(0.347)	(0.593)	(0.548)	(0.311)	(0.322)	(0.934)	(1.062)
wdi_imigs	-4.065	-3.914	10.512	38.538	-1.765***	-1.813***	-8.716***	-6.325***
	(3.256)	(3.455)	(26.131)	(27.224)	(0.516)	(0.494)	(0.591)	(0.802)
wvs_hap	-19.752***	-21.444***	-21.727*	-24.057**	-22.522***	-22.320***	-203.839***	-151.825***
	(5.602)	(5.709)	(10.736)	(8.919)	(6.467)	(6.467)	(15.063)	(21.562)
wdi_pop14	0.006	0.054	-3.813**	-4.517***	-0.834	-0.653	-29.815***	-18.552***
	(0.859)	(0.907)	(1.387)	(1.104)	(0.902)	(0.899)	(2.349)	(2.682)
unna_ggfce		-0.951		-1.498		-0.003		-14.894***
		(1.338)		(1.489)		(0.642)		(2.152)
ltemp_c					0.103	0.096		
					(0.071)	(0.072)		
Observations	33	33	16	16	60	60	17	17
R-squared	0.572	0.560	0.933	0.934	0.672	0.670	0.994	0.971
Number of countries	12	12	7	7	33	33	9	9

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

Due to a lack of observations, we do not include sub-Saharan Africa, meaning there is no (5) and (6) for table X, though we keep the same notation for consistency. We also have to drop long-term unemployment due to a lack of observations. Furthermore, results for East-Southeast Asia and the Middle East and North Africa lack observations and the models are likely over-specified. What we can see from table X are three things, the inconsistency in results, the inconsistency of proposed trust creating mechanisms being significant as well as regional differences.

Excluding regression (9) and (10) government size is not significant for any regression. Furthermore, all variables for education, unemployment and education are insignificant in (1) and (2) as well as (7) and (8) which are the only models which have enough observations and likely are not over-fitted, except education for (2) which is significant at the 10 percent level. However, education is significant in the wrong direction. Looking at our final subsample for hypothesis two, table XI includes three different measures for government size and unemployment.

Table XI OECD Subsample for Hypothesis II

VARIABLES	(1) trust	(2) trust	(3) trust	(4) trust	(5) trust	(6) trust	(7) trust	(8) trust	(9) trust
unna_ln	-1.910	0.554	15.276						
	(6.513)	(5.228)	(12.123)						
unna_ggfce				0.096	0.160	1.033*			
				(0.385)	(0.290)	(0.589)			
govsize							-1.556	-1.290	-2.345
							(1.150)	(1.027)	(1.597)
bci_c	0.545	0.386	0.162	0.553	0.386	0.115	0.331	0.219	0.095
	(0.573)	(0.409)	(0.868)	(0.576)	(0.409)	(0.873)	(0.544)	(0.398)	(0.712)
dr_ig	0.288	0.337*	0.115	0.285	0.343*	0.097	0.219	0.250	0.133
	(0.233)	(0.179)	(0.284)	(0.236)	(0.176)	(0.278)	(0.231)	(0.183)	(0.301)
wdi_imigs	-0.857	-0.859	-0.679	-0.903	-0.901*	-0.706	-0.854	-0.820	-0.791
	(0.566)	(0.517)	(0.601)	(0.572)	(0.525)	(0.603)	(0.578)	(0.506)	(0.700)
wvs_hap	-18.902***	-19.122***	-13.687	-18.365***	-18.804***	-12.208	-18.383***	-18.752***	-17.725
	(4.641)	(4.986)	(11.226)	(4.695)	(5.034)	(10.496)	(4.240)	(4.424)	(13.119)
wdi_pop14	0.198	0.517	-0.335	0.257	0.548	-0.375	0.404	0.577	-0.286
	(0.710)	(0.591)	(1.038)	(0.689)	(0.556)	(0.996)	(0.642)	(0.520)	(0.983)
ltemp_c	0.056			0.050			0.064		
	(0.050)			(0.051)			(0.049)		
emp_c		0.127***			0.127***			0.116***	
		(0.037)			(0.036)			(0.039)	
sc_uecov			-.326***			-.326***			-.249**
			(11.418)			(11.125)			(10.605)
Observations	104	113	76	104	113	76	104	113	76
R-squared	0.202	0.276	0.154	0.201	0.278	0.171	0.235	0.300	0.201
Number of countries	35	35	28	35	35	28	35	35	28

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

For all regressions except (6) measures of government size are insignificant as expected, however again this needs to be put into context of a lack in significance for previous regressions. The second observation is that long-term unemployment is insignificant in all cases, while employment change and unemployment coverage are all significant for the five percent level. However, interpreting the coefficient emp_c implies that for each percentage point increase in the change of unemployment, trust increases by $1/10^{th}$ of a percentage point, implying that rising unemployment change would increase trust. Furthermore, the coefficient for unemployment coverage implies that for each percentage point for the workforce that is covered by unemployment trust is reduced by $1/3^{rd}$ of a percentage point.

To summarize, we find little to no support in table IX with most measures for our proposed trust creating variables being insignificant in general, as well as the lack of support for most regressions in table VII under hypothesis one with regard to the insignificance of government size. While there is a general lack of observations for our regional subsamples, there is little to no evidence in support of hypothesis one even for the limited cases where we have enough observations. Finally, using different measures for unemployment did also not support the second hypothesis.

4.3 Hypothesis III and IV

We rely on the Granger (non)-causality test to empirically test the causal relationship between trust and government size to answer H_3 and H_4. In order to test our H_3 and H_4 in regard with the Granger causality between trust and government size we implement a bivariate VAR model as described in section 3.4. We specify the VAR model including the variables of interest: trust and government size. Due to the nature of our micro panel of small T and large N we are limited in choosing lags.

As a result, we are only able to estimate a maximum lag order of three since we cannot have fewer observations than parameters. To examine all possibilities, we estimate three different VAR models of first-order, second-order and third-order.

The null hypothesis of the Granger causality Wald test is that the coefficient of the lagged excluded variable is zero. Specifically, all the coefficients on the lags of variable X will be zero in estimating variable Y under the null hypothesis that variable X does not Granger cause variable Y.

Table XII Granger Non-causality Wald Test

	(VAR(1))	(VAR(2))	(VAR(3))
EQUATIONS	P-value of χ^2	P-value of χ^2	P-value of χ^2
unna_ggfce →trust	0.740	0.400	0.055*
trust → unna_ggfce	0.659	0.873	0.000***
govsize → trust	0.124	0.000***	0.018**
trust → govsize	0.939	0.116	0.088*

*** p<0.01, ** p<0.05, * p<0.1

We test Granger causality on two measures for government size. For both variables we see that trust and government size Granger cause one another. Furthermore, for government size measured as an index there are also significant results for two lags. Looking at it from the other perspective, no variable causes any other variable with one lag, and little evidence over a two year period. For three out of four pairwise tests we see a decrease in p-value as lags increase.

An interpretation of this grounded on the theory presented in chapter two would imply that both trust and government size take time to create and change, but also seem to cause one another. Taking into context that our variables are measured as waves that cover five year periods each, this implies that it seems to take around a decade before a change seems to Granger cause a change in another variable.

This would be in accordance with the idea that generalized trust is a sticky value with a set baseline formed at a young age which then only moves slowly. This also makes intuitive sense in regard to trust Granger causing government size. Even with a hypothetical large

sudden positive or negative shock to trust, intuitively we would expect changes in government size to take one or two election cycles to manifest. This result also provides support for the idea of a feedback loop. Trust and government size Granger cause one another and would support the idea of societies entering positive or negative feed-back loops.

5 Conclusions

5.1 Answer to our Hypotheses and Research Questions

To answer our four hypotheses, which were:

H_1: Size of government correlates positively and significantly with the level of generalized trust in society

H_2: Size of government does not correlate positively with the level of generalized trust when controlling for education, change in unemployment and inequality or other measures for welfare spending

H_3: Size of government Granger causes generalized trust.

H_4: Generalized trust Granger causes size of government.

We conclude that the results for H_1 were generally insignificant across several measures for government size, subsamples as well as for both static and dynamic models, whether we took the level of the variables, the change in variables, or the natural logarithm. While the correlation between trust and size of government was positive for all measures shown in the correlation table we found little to no evidence for government size in itself significantly impacting trust in our models and hence we reject hypothesis one.

Results for H_2 provided some support towards that education, income inequality and unemployment are significant factors, however, it is not possible to argue or state that the size of government became insignificant when controlling for the above, as size of government was insignificant in the majority of cases regardless. Furthermore, even in the cases when the control variables were significant, the expected sign of a coefficient did often not match the prediction adding further unclarities to our answer. Since there is little evidence or support, and since government size was insignificant in the majority of cases regardless whether we controlled for education, unemployment or inequality we reject hypothesis two.

Our results for H_3 and H_4 indicate that generalized trust and size of government seem to Granger cause each other. However, any shift in trust or government size would take five to ten years before showing results as only government size Granger caused trust at two lags, representing five to ten years, while both measures of government size Granger cause and were Granger caused by trust. The lack of significant results for one lag and two lags overall reject the idea of an immediate response mechanism but strengthen the idea of generalized trust being

sticky and changing only slowly over time, similarly that both independent and dependent seem to Granger cause each other indicates evidence for a feedback loop. Thus, we find no support for that government size and trust seem to Granger cause one-another in the short-term but find support that so is the case after a period of several years and partly fail to reject hypothesis three and four.

5.2 Flaws and Limitations

The main issue we see with this approach is the limitation in data, while panel data exists and theoretically should suffice, the amount of gaps in data complicates interpretation and estimation. Furthermore, data is required to span a wide variety of topics, countries and over time. Leading to difficulties in creating a reliable model that is testable. While we still have faith in our general model specification, a possible significant limitation and flaw is that there were not enough observations to adequately run a dynamic model which could have provided more information on the results obtained.

Similarly, the data is also complex due to that several measures are subjective measures as they are based on the feeling of individual people across nations and continents as well as artificial indexes. Given that the fixed effects model is sensitive to measurement errors, it is possible that data on subjective and index based variables is inappropriate at the current time.

Another limitation is the underlying framework. Part of the purpose of this paper was to investigate the link and role that the size of government has in regard to trust, however, our results seem to indicate that theory and data are not yet able to adequately account for trust in different countries and that there is more qualitative applied research needed to allow for a clearer understanding. A flaw in this study and a suggestion for future research would be to narrow down the approach taken and focus on more homogenous country or even a single country over time, which would allow for greater control of model specification and allow to take into account different cultural, institutional or other differences which might be an issue with our approach. This due to the fact that our panel data estimates imply that education in one part of the world should have at least the same directional impact on trust as in another part of the world, for both our subsamples for hypothesis one and two we find some evidence towards that the impact of the same variable can differ, with education having a positive relationship in some regions and a negative relationship in others.

Similarly, there are certain questions that we cannot provide an answer for with our theory or method chosen which relate to the interpretation of our controls, which admittedly

were not part of our purpose, namely why corruption and happiness provided confusing results with estimates and direction of correlation being very different based on model chosen.

5.3 Research and Policy Suggestions

Concerning research suggestions, we recommend the following three measures to be undertaken:

1. Focus on establishing consistent theory.
2. Focus on qualitative studies that are constrained to homogenous regions or countries.
3. Re-focus empirical research within the field of trust research to looking closer at time series models for individual countries only until further clarity or agreement is achieved within the field.

It is our belief that not only our thesis, but the field of trust research in general suffers from the same issues. The measures for trust used are universal and as such would provide similarly issues for other research. In a related vain further panel studies even cross-sectional studies will risk difficulties in interpretation of variables and inconclusive results until regional differences between trust and its predictors are established. The results of this paper provide as much information as if we had failed to disprove our hypothesis. This paper has contributed to the limitations within the field of trust, especially to limitations in the approaches that are currently common and wide-spread within the research on trust. We strongly believe that future research should take a step back rather than trying to solve the puzzle of trust, trust creation and the role of government in trust creation and re-focus on providing partial answers until greater understanding is at hand.

Our results imply a warning for public policy. While our results provide no evidence on what creates or destroys trust our results indicate that government size and generalized trust seem to Granger cause one another. This does not imply that there is actual casualization however two recent developments in some countries in the OECD give this finding urgency. We cannot provide an answer on what started the decline in trust. However, our results would seem to imply that a decrease in welfare support and by extension government size, through for example austerity, all else equal, could Granger cause a decline in trust, and that the decline in trust experienced in parts of the world would imply an incoming decline in size of government. This goes contrary to the findings of Newton (2006), who found no correlation between austerity policies and generalized trust, however, this would be in line with our findings and that it takes more time than a year or two for that change in generalized trust to

come into effect. In other words, there is some evidence towards that certain countries might currently be in the middle of a negative feed-back loop.

Given our results we recommend that public policy should investigate the issues surrounding trust further. There is general agreement on that trust plays a significant role in variety of outcomes from growth to political participation, and that generalized trust especially is currently declining. Based on the limitations of the data currently available we would recommend more funding for data accumulation as well as funding for qualitative regional-focused research to investigate regional-specific causes for the decrease or increase in trust.

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Appendix

Appendix A : Variable Statistics

Table I List of Included Countries

Albania [••••••]	El Salvador [•••••]	Lithuania [••••••]	Slovakia [••••••]
Algeria [••••••]	Estonia [••••••]	Luxembourg [••••••]	Slovenia [••••••]
Andorra [••••••]	Ethiopia (1993-) [••••••]	Macedonia [••••••]	South Africa [••••••]
Argentina [••••••]	Finland [••••••]	Malaysia (1966-) [••••••]	South Korea [••••••]
Armenia [•••••]	France (1963-) [••••••]	Mali [••••••]	Spain [••••••]
Australia [••••••]	Georgia [••••••]	Malta [••••••]	Sweden [••••••]
Austria [••••••]	Germany [••••••]	Mexico [••••••]	Switzerland [••••••]
Azerbaijan [••••••]	Ghana [••••••]	Moldova [••••••]	Taiwan [••••••]
Bahrain [••••••]	Greece [••••••]	Montenegro [••••••]	Tanzania [••••••]
Bangladesh [••••••]	Guatemala [••••••]	Morocco [••••••]	Thailand [••••••]
Belarus [••••••]	Hungary [••••••]	Netherlands [••••••]	Trinidad and Tobago [••••••]
Belgium [••••••]	Iceland [••••••]	New Zealand [••••••]	Tunisia [••••••]
Bosnia and Herzegovina [••••••]	India [••••••]	Nigeria [••••••]	Turkey [••••••]
Brazil [••••••]	Indonesia [••••••]	Norway [••••••]	Uganda [••••••]
Bulgaria [••••••]	Iran [••••••]	Pakistan (1971-) [••••••]	Ukraine [••••••]
Burkina Faso [••••••]	Iraq [••••••]	Peru [••••••]	United Kingdom [••••••]
Canada [••••••]	Ireland [••••••]	Philippines [••••••]	United States [••••••]
Chile [••••••]	Israel [••••••]	Poland [••••••]	Uruguay [••••••]
China [••••••]	Italy [••••••]	Portugal [••••••]	Uzbekistan [••••••]
Colombia [••••••]	Japan [••••••]	Qatar [••••••]	Venezuela [••••••]
Croatia [••••••]	Jordan [••••••]	Romania [••••••]	Vietnam [••••••]
Cyprus (1975-) [••••••]	Kazakhstan [••••••]	Russia [••••••]	Yemen [••••••]
Czech Republic [••••••]	Kuwait [••••••]	Rwanda [••••••]	Zambia [••••••]
Denmark [••••••]	Kyrgyzstan [••••••]	Saudi Arabia [••••••]	Zimbabwe [••••••]
Dominican Republic [••••••]	Latvia [••••••]	Serbia [••••••]	
Ecuador [••••••]	Lebanon [••••••]	Serbia and Montenegro [••••••]	
Egypt [••••••]	Libya [••••••]	Singapore [••••••]	

Note: The information in the brackets depicts the wave participation pattern of the various countries. A red dot signifies participation in that wave, while a black dot describes no participation – e.g. •••••• illustrates participation in the 3,4 and 5 waves.

Table II List of Region Specific Dummies Created

Nordic	Former Communist	OECD	East Asia	Latin	Middle East	Sub-Saharan Africa
Denmark	Armenia	Australia	China	Argentina	Algeria	Burkina Faso
Finland	Azerbaijan	Austria	Indonesia	Brazil	Bahrain	Ethiopia
Iceland	Belarus	Belgium	Japan	Chile	Egypt	Ghana
Norway	Bulgaria	Canada	Malaysia	Columbia	Iran	Mali
Sweden	Czech Republic	Chile	Philippines	Dominican	Iraq	Nigeria
	Estonia	Czech Republic	Singapore	Republic	Israel	Rwanda
	Georgia	Denmark	South Korea	Ecuador	Jordan	South Africa
	Hungary	Estonia	Taiwan	El Salvador	Kuwait	Tanzania
	Kazakhstan	Finland	Thailand	Guatemala	Lebanon	Uganda
	Kyrgyzstan	France	Vietnam	Mexico	Libya	Zambia
	Latvia	Germany		Peru	Morocco	Zimbabwe
	Lithuania	Greece		Trinidad and	Pakistan	
	Moldova	Hungary		Tobago	Qatar	
	Poland	Iceland		Uruguay	Saudi Arabia	
	Romania	Ireland		Venezuela	Tunisia	
	Russia	Israel			Turkey	
	Slovakia	Italy			Yemen	
	Tajikistan	Japan				
	Turkmenistan	Korea				
	Ukraine	Latvia				
	Uzbekistan	Lithuania				
		Luxembourg				
		Mexico				
		Netherlands				
		New Zealand				
		Norway				
		Poland				
		Portugal				
		Slovakia				
		Slovenia				
		Spain				
		Sweden				
		Switzerland				
		Turkey				
		United Kingdom				
		United States				

Notes: List is compiled and categorized by authors. Any mistakes are our own.

Table III Review of Variables

Variable Code	Variable	Description	Name of Data Source
trust | Δ	Generalized Trust	Ask whether most people can be trusted, or you need to be careful in dealing with people	World Values Survey / European Values Survey
govsize | Δ	Government Size (reversed)	Reversed "fi_sog" where 10 is large government and 0 is small government.	Fraser Institute
fi_sog	Government Size (original)	An index that ranges from 0 to 10 where 0 is large government and 10 is small government. The index consists of aspects such as general government consumption as % of total consumption, transfers and subsidies as a % of GDP and top marginal tax rate.	Fraser Institute
unna_ggfce | Δ	GDP: General Government Final Consumption Expenditure	The general government final consumption expenditures	UN Statistics
wdi_expmil | Δ	Military Expenditure (% of GDP)	Derived from the NATO definition meaning it includes all current and capital expenditures on armed forces, defense ministries, paramilitary forces, peacekeeping forces and other government agencies in defense. Calculated as percentage of GDP	The World Bank Group
wdi_expmilge | Δ	Military Expenditure (% of Central Government Expenditure)	Alike "wdi_expmil" but calculated as the percentage of central government expenditures	The World Bank Group
wdi_taxrev | Δ	Tax Revenue (% of GDP)	Refers to compulsory transfers to the central government. Most social security contributions, fines and penalties are excluded in this measure.	The World Bank Group
wdi_expedu | Δ	Government Expenditure on Education as % of GDP (%)	This measure includes government expenditures funded by transfers from international institutions to the government	The World Bank Group
wdi_expeduge | Δ	Expenditure on Education as % of Total Government Expenditure (%)	Alike "wdi_expedu" but measures public expenditure on education incurred by the general government.	The World Bank Group
education | Δ	Average Schooling Years, Female and Male (25+)	Average schooling years for both female and male above the age of 25.	Barro & Lee
wdi_unemplt | Δ	Long-term Unemployment (% of Total Unemployment)	Describes the number of people with continuous periods of unemployment. Specifically, for a year or longer. It is the percentage of total unemployed.	The World Bank Group
wdi_unemp | Δ	Unemployment, Total (% of Total Labor Force)	Standard measure of unemployment that depicts the share of the labor force that is still seeking employment but is without work.	The World Bank Group
bci_bci | Δ	The Bayesian Corruption Indicator	This variable reflects a corruption index with values between 0 and 100. Wherein, a larger number means a rise in the level of corruption. Thus, zero means no corruption at all.	Sherppa Ghent University: The Bayesian Corruption Index
dr_ig	Index of Globalization	This is an overall index of globalization based on economic globalization, social globalization and political globalization.	Axel Dreher: KOF Index of Globalization
wvs_hap	Subjective Happiness	Subjective feeling of happiness based on survey answers	World Values Survey / European Values Survey
wdi_imigs	International Migrant Stock (% of Population)	This is the number of people born in a country other than the country they live in. This also encompasses refuges.	The World Bank Group
wdi_incsh10h | Δ	Income Share Held by Highest 10%	Percentage share of income or consumption is the share that accrues to the highest 10% income earners.	The World Bank Group
wdi_pop14	Population, ages 0-14 (% of total)	The de facto Population between the age 0 to 14 as a percentage of the total population.	The World Bank Group
wdi_pop65	Population ages 65 and above (% of total)	The de facto Population above ages 65 and above as a percentage of the total population.	The World Bank Group
wdi_gini	GINI index (World Bank estimate)	This index measures how the distribution of income among households and individuals deviate from a perfectly equal distribution. A value of 0 depicts perfect equality while a value of 100 depicts perfect inequality.	The World Bank Group
sc_uecov	Unemployment Coverage	Percentage of labor force insured for unemployment risk	Lyle Scruggs: The Comparative Welfare Entitlements Dataset
ess_trparl	Trust in the Parliament	Subjective measure of how much individuals trusts the parliament. Wherein, 0 reflects no trust in the particular institution and 10 depicts complete trust.	European Social Survey

Note: Descriptions of variables adapted from the QoG codebook.
Variables marked with "Δ" have also been transformed to have a change counterpart - as well as a Ln counterpart. These will be utilized throughout the study and will be identified as *variablecode*_c. For a comprehensive summary we refer to the QoG codebook: Dahlberg, S., et al. "The Quality of Government Standard Dataset." (2018).

Table IV Descriptive Statistics

Variables	Obs	Mean	Std.Dev.	Min	Max	Min. Year*	Max. Year*	N*	$\bar{N}$*	$\bar{T}$*
Trust	291	28.791	15.882	3.167	76.123	1981	2014	105	10	3
trust_c	135	-1.287	8.758	-54.733	17.776	1982	2014	105	10	3
govsize	269	4.193	1.512	1.229	8.373	1970	2014	160	60	17
govsize_c	160	.602	6.142	-36.411	20.783	1971	2014	160	60	17
unna_ggfce	287	16.585	4.816	4.543	33.374	1970	2014	201	173	39
unna_c	287	1.251	4.155	-11.594	29.636	1971	2014	201	173	39
unna_ln	287	2.758	.326	1.513	3.477	1970	2014	201	173	39
wdi_expmil	259	2.144	1.322	.175	9.743	1988	2014	165	138	23
expmil_c	256	-.86	7.314	-25.348	46.735	1989	2014	165	138	23
wdi_expmilge	186	8.563	5.965	.487	29.243	1990	2013	142	76	13
expmilge_c	182	-1.575	6.58	-22.034	26.881	1991	2013	142	76	13
wdi_taxrev	188	17.087	7.271	.832	57.539	1990	2013	160	90	14
taxrev_c	185	-.304	5.821	-40.968	19.162	1991	2013	160	90	14
wdi_expedu	237	4.575	1.398	1.067	8.14	1970	2014	187	70	17
expedu_c	219	1.229	7.297	-34.271	25.567	1971	2014	187	70	17
wdi_expeduge	169	13.778	3.794	6.536	26.007	1995	2014	173	78	9
expeduge_c	149	.309	6.937	-27.636	28.47	1996	2014	173	78	9
education	263	8.507	2.486	1.155	13.424	1950	2010	147	25	10
edu_c	251	9.003	7.158	-12.021	39.793	1951	2010	147	25	10
wdi_unemplt	184	31.55	19.278	.35	85.625	1980	2014	110	39	12
ltemp_c	161	4.205	19.64	-26.207	197.917	1981	2014	110	39	12
wdi_unemp	264	8.895	5.844	.42	34.84	1991	2014	172	167	23
emp_c	264	1.691	8.817	-16.665	47.57	1992	2014	172	167	23
bci_bci	288	42.196	13.621	14.757	65.561	1984	2014	198	162	25
bci_c	267	.252	1.042	-3.07	5.572	1985	2014	198	162	25
dr_ig	286	63.331	15.509	27.941	92.18	1970	2013	187	162	38
wvs_hap	290	3.072	.263	1.872	3.613	1981	2014	105	10	3
wdi_imigs	284	7.284	10.12	.033	73.94	1960	2010	196	34	9
wdi_incsh10h	190	29.669	6.979	20.424	51.26	1981	2013	156	37	8
inc_c	99	-.048	4.772	-9.309	37.828	1982	2013	156	37	8
wdi_pop14	286	24.63	8.675	13.123	49.391	1960	2014	189	154	45
sc_uecov	99	75.844	20.448	0	106.6	1970	2011	32	22	29
ess_trparl	41	4.501	1.223	1.902	6.593	2002	2014	32	13	5

Note: Columns marked with "*" describes the original statistics from the QoG before aggregating the data.

Table V Descriptive Statistics for Latin America

Variables	Obs	Mean	Std.Dev.	Min	Max
Trust	37	15.634	8.044	3.219	33.454
govsize	37	2.965	.905	1.409	4.6
unna_ggfce	37	12.184	2.759	7.373	19.356
unna_ln	37	2.475	.214	1.981	2.963
wdi_taxrev	23	15.411	4.824	8.95	27.789
wdi_unemplt	16	16.515	16.932	.625	59.7
ltemp_c	14	3.306	15.069	-21.071	31.544
education	37	7.439	1.697	3.743	10.369
edu_c	37	9.436	6.604	-5.524	26.148
wdi_incsh10h	34	39.36	4.357	31.398	46.27
wdi_imigs	37	1.777	1.764	.128	6.834
bci_bci	37	49.95	9.622	31.03	62.858
bci_c	35	.262	.727	-2.107	1.605
dr_ig	37	57.895	7.423	40.544	73.404
wvs_hap	37	3.195	.204	2.887	3.613
wdi_pop14	37	29.9	5.805	20.737	44.335

Note: Columns show the descriptive statistics for the region specified. To see which countries are included in that region see Table IIA in Appendix A.

Table VI Descriptive Statistics for East and Southeast Asia

Variables	Obs	Mean	Std.Dev.	Min	Max
Trust	33	35.053	15.833	3.167	63.131
govsize	33	3.708	1.262	1.317	6.354
unna_ggfce	30	12.814	3.411	5.591	20.351
unna_ln	30	2.51	.299	1.721	3.013
wdi_taxrev	20	12.981	1.909	9.638	15.526
wdi_unemplt	18	14.088	11.906	.35	38.86
ltemp_c	16	7.847	14.081	-6.227	46.658
education	33	8.498	2.029	4.755	11.893
edu_c	33	11.359	7.243	2.544	33.845
wdi_incsh10h	16	30.414	3.339	24.77	36.27
wdi_imigs	30	3.607	9.086	.033	38.743
bci_bci	33	42.218	11.397	16.072	58.708
bci_c	31	.06	1.14	-3.07	2.186
dr_ig	30	58.592	13.024	35.366	87.641
wvs_hap	32	3.146	.168	2.863	3.526
wdi_pop14	30	23.353	7.161	13.123	39.268

Note: Columns show the descriptive statistics for the region specified. To see which countries are included in that region see Table IIA in Appendix A.

Table VII Descriptive Statistics for Sub-Saharan Africa

Variables	Obs	Mean	Std.Dev.	Min	Max
Trust	21	15.776	7.581	4.87	29.03
govsize	21	3.828	1.039	2.346	7.507
unna_ggfce	21	14.671	4.53	5.082	21.659
unna_ln	21	2.622	.373	1.611	3.074
wdi_taxrev	13	12.747	6.861	1.22	25.231
wdi_unemplt	4	41.556	14.391	26.225	58.8
ltemp_c	2	-.643	5.646	-4.636	3.349
education	15	5.646	2.187	1.155	9.43
edu_c	15	12.502	11.616	-12.021	35.625
wdi_incsh10h	15	38.995	7.959	27.96	51.26
wdi_imigs	21	3.064	2.139	.468	7.804
bci_bci	21	51.579	10.153	28.804	64.158
bci_c	20	.274	.6	-.858	1.931
dr_ig	21	45.874	8.39	33.831	64.935
wvs_hap	21	3.11	.233	2.66	3.578
wdi_pop14	21	41.996	4.662	30.3	49.391

Note: Columns show the descriptive statistics for the region specified. To see which countries are included in that region see Table IIA in Appendix A.

Table VIII Descriptive Statistics for OECD

Variables	Obs	Mean	Std.Dev.	Min	Max
Trust	132	35.974	15.75	6.504	76.123
govsize	131	4.851	1.483	2.014	8.373
unna_ggfce	132	18.433	4.341	8.749	27.047
unna_ln	132	2.882	.263	2.166	3.297
wdi_taxrev	80	18.789	7.237	8.95	57.539
wdi_unemplt	119	30.266	17.152	.35	65.78
ltemp_c	116	5.183	21.834	-26.207	197.917
education	131	9.611	2.042	3.919	13.424
edu_c	124	6.873	4.768	-3.007	19.461
wdi_incsh10h	74	27.546	6.36	20.424	46.053
wdi_imigs	131	7.848	7.225	.424	35.876
bci_bci	131	32.683	11.072	14.757	55.981
bci_c	113	.243	1.208	-3.07	5.572
dr_ig	132	73.284	12.241	35.366	92.18
wvs_hap	131	3.135	.21	2.623	3.613
wdi_pop14	132	20.099	5.363	13.123	44.335

Note: Columns show the descriptive statistics for the region specified. To see which countries are included in that region see Table IIA in Appendix A.

Table IX Descriptive Statistics for Middle Eastern and North African Countries

Variables	Obs	Mean	Std.Dev.	Min	Max
Trust	33	23.994	14.081	6.504	65.349
govsize	29	3.657	1.244	1.229	6.833
unna_ggfce	33	16.29	5.736	8.134	33.374
unna_ln	33	2.729	.339	2.095	3.477
wdi_taxrev	23	15.894	8.104	.832	35.794
wdi_unemplt	20	36.442	22.624	7.5	83.6
ltemp_c	14	3.245	12.996	-21.121	21.428
education	32	5.918	1.96	2.597	11.799
edu_c	32	13.763	7.657	-1.287	39.793
wdi_incsh10h	17	28.725	2.625	23.7	33.1
wdi_imigs	33	12.77	20.685	.153	73.94
bci_bci	32	49.232	9.911	21.972	65.33
bci_c	32	.388	1.271	-2.752	5.567
dr_ig	33	56.781	11.683	36.303	73.825
wvs_hap	33	2.979	.293	1.872	3.54
wdi_pop14	33	31.876	6.93	14.41	42.585

Note: Columns show the descriptive statistics for the region specified. To see which countries are included in that region see Table IIA in Appendix A.

Table X Correlation Between Variables for Latin America

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) trust	1.0000															
(2) govsize	-0.4176	1.0000														
(3) unna_ggfce	-0.9030	0.3290	1.0000													
(4) unna_ln	-0.9280	0.3871	0.9955	1.0000												
(5) wdi_taxrev	-0.6032	0.0773	0.5399	0.5805	1.0000											
(6) wdi_unemplt	-0.6838	0.6521	0.8411	0.8415	0.2087	1.0000										
(7) ltemp_c	0.6145	-0.1602	-0.4084	-0.4720	-0.8228	-0.1260	1.0000									
(8) education	-0.6200	0.0942	0.2967	0.3375	0.5304	-0.0801	-0.5440	1.0000								
(9) edu_c	-0.2655	-0.1289	0.2497	0.2029	-0.2664	0.1835	0.3595	0.2324	1.0000							
(10) wdi_incsh10h	-0.4370	0.6071	0.5915	0.5771	-0.2499	0.8876	0.1888	-0.2922	0.3155	1.0000						
(11) wdi_imigs	0.1213	-0.2693	-0.2835	-0.2377	0.6436	-0.5669	-0.5502	0.3935	-0.5297	-0.8631	1.0000					
(12) bci_bci	-0.2070	0.1888	0.3372	0.2879	-0.5945	0.5387	0.5029	-0.2628	0.6531	0.8211	-0.9829	1.0000				
(13) bci_c	-0.3116	0.6878	0.3741	0.3681	-0.4377	0.7363	0.3399	-0.2064	0.4055	0.9341	-0.8783	0.8369	1.0000			
(14) dr_ig	-0.2375	-0.3241	-0.1078	-0.1370	0.8417	-0.3287	-0.6514	0.6002	-0.2389	-0.7150	0.8891	-0.8100	-0.8065	1.0000		
(15) wvs_hap	-0.6362	0.4728	0.3685	0.4183	0.0928	0.3359	-0.5481	0.4444	0.0638	0.3850	-0.2321	0.2760	0.4017	-0.1530	1.0000	
(16) wdi_pop14	0.8029	-0.2771	-0.7041	-0.7458	-0.9265	-0.3858	0.7636	-0.6912	-0.1199	-0.0424	0.4369	-0.3749	-0.1829	0.6995	-0.2809	1.0000

Table XI Correlation Between Variables for East and Southeast Asia

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) trust	1.0000															
(2) govsize	0.9637	1.0000														
(3) unna_ggfce	0.9967	0.9822	1.0000													
(4) unna_ln	0.9996	0.9705	0.9985	1.0000												
(5) wdi_taxrev	-0.1163	-0.3771	-0.1962	-0.1427	1.0000											
(6) wdi_unemplt	0.8846	0.9770	0.9194	0.8967	-0.5661	1.0000										
(7) ltemp_c	-0.9381	-0.9965	-0.9631	-0.9470	0.4531	-0.9914	1.0000									
(8) education	0.4608	0.6809	0.5310	0.4842	-0.9351	0.8215	-0.7396	1.0000								
(9) edu_c	0.3442	0.0812	0.2672	0.3191	0.8925	-0.1334	0.0022	-0.6747	1.0000							
(10) wdi_incsh10h	-0.8688	-0.9694	-0.9060	-0.8817	0.5928	-0.9995	0.9865	-0.8398	0.1658	1.0000						
(11) wdi_imigs	0.9560	0.8430	0.9291	0.9478	0.1803	0.7088	-0.7952	0.1801	0.6046	-0.6853	1.0000					
(12) bci_bci	-0.7677	-0.9109	-0.8170	-0.7845	0.7258	-0.9779	0.9421	-0.9225	0.3374	0.9843	-0.5458	1.0000				
(13) bci_c	0.6128	0.3796	0.5468	0.5915	0.7137	0.1735	-0.3012	0.4190	0.9529	-0.1411	0.8177	0.0360	1.0000			
(14) dr_ig	0.9396	0.8141	0.9088	0.9301	0.2307	0.6715	-0.7629	0.1291	0.6448	-0.6468	0.9987	-0.5019	0.8463	1.0000		
(15) wvs_hap	-0.8546	-0.9622	-0.8938	-0.8682	0.6151	-0.9982	0.9816	-0.8546	0.1933	0.9996	-0.6647	0.9888	-0.1134	-0.6253	1.0000	
(16) wdi_pop14	0.9970	0.9814	1.0000	0.9987	0.1923	0.9178	-0.9620	0.5276	0.2711	-0.9043	0.9306	-0.8147	0.5502	0.9105	-0.8920	1.0000

Table XII Correlation Between Variables for Sub-Saharan Africa

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) trust	1.0000													
(2) govsize	0.6072	1.0000												
(3) unna_ggfce	0.4872	0.6365	1.0000											
(4) unna_ln	0.4412	0.6489	0.9939	1.0000										
(5) wdi_taxrev	0.5966	0.4677	0.6494	0.5756	1.0000									
(6) education	0.3151	0.1914	0.1173	0.0339	0.7598	1.0000								
(7) edu_c	0.0934	0.3139	-0.0387	0.0104	-0.5373	-0.5196	1.0000							
(8) wdi_incsh10h	0.2634	0.4543	0.3192	0.2698	0.5177	0.6191	0.0208	1.0000						
(9) wdi_imigs	-0.3045	0.2290	-0.3519	-0.3301	-0.1318	0.1952	0.1352	-0.0137	1.0000					
(10) bci_bci	0.0671	-0.5884	-0.2294	-0.2592	-0.0388	0.1060	-0.3232	-0.5078	-0.3213	1.0000				
(11) bci_c	0.7148	0.5340	0.6749	0.6519	0.5925	0.3025	-0.0026	-0.0001	-0.1113	0.3135	1.0000			
(12) dr_ig	0.5691	0.2818	0.3133	0.2253	0.9212	0.8684	-0.6401	0.4457	-0.0275	0.1100	0.4467	1.0000		
(13) wvs_hap	0.3576	0.6505	0.3024	0.3538	0.1464	-0.1383	0.0547	-0.2966	0.3343	-0.2061	0.4573	0.0820	1.0000	
(14) wdi_pop14	-0.4614	-0.6561	-0.5798	-0.5244	-0.9045	-0.7527	0.3510	-0.6153	-0.2462	0.3461	-0.4866	-0.8146	-0.2697	1.0000

Note: wdi_unemplt and ltemp_c are excluded due to lack of observations in this region.

Table XIII Correlation Between Variables for OECD

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) trust	1.0000															
(2) govsize	0.3154	1.0000														
(3) unna_ggfce	0.4056	0.7866	1.0000													
(4) unna_ln	0.3512	0.7662	0.9864	1.0000												
(5) wdi_taxrev	0.1807	0.2651	0.3690	0.3692	1.0000											
(6) wdi_unemplt	-	0.1932	0.0743	0.1426	-	1.0000										
	0.4475				0.0377											
(7) ltemp_c	0.0317	0.0161	0.0424	-	-	-	1.0000									
				0.0078	0.2643	0.1726										
(8) education	0.3367	0.2668	0.3660	0.4113	-	0.1712	0.0947	1.0000								
					0.0132											
(9) edu_c	-	-	-	-	-	-	-	-	1.0000							
	0.1997	0.2129	0.2709	0.2849	0.0500	0.0286	0.0539	0.3453								
(10) wdi_incsh10h	-	-	-	-	-	-	0.1791	-	0.2359	1.0000						
	0.3774	0.6826	0.6768	0.7195	0.2244	0.3788		0.5228								
(11) wdi_imigs	0.1951	0.0462	0.1072	0.1113	0.0021	-	0.2594	0.3643	-	-	1.0000					
						0.2044			0.3037	0.0701						
(12) bci_bci	-	-	-	-	-	0.3624	0.0036	-	0.2721	0.4567	-	1.0000				
	0.8334	0.3630	0.4250	0.4030	0.1625			0.3104			0.4335					
(13) bci_c	-	0.0461	0.2125	0.2091	0.0052	0.1322	0.1597	0.0729	-	-	-	0.0971	1.0000			
	0.0673								0.1892	0.1311	0.0629					
(14) dr_ig	0.4479	0.5181	0.5590	0.5781	0.1303	0.2128	-	0.3524	-	-	0.2147	-	0.1036	1.0000		
							0.1502		0.2580	0.6928		0.5658				
(15) wvs_hap	0.4918	0.0524	0.1125	0.0723	-	-	-	0.0600	-	0.0058	0.2305	-	-	0.3000	1.0000	
					0.0018	0.5402	0.0552		0.2402			0.6046	0.0602			
(16) wdi_pop14	-	-	-	-	-	-	0.2880	-	0.1963	0.7325	-	0.1720	-	-	0.2138	1.0000
	0.0998	0.3371	0.3873	0.4816	0.0185	0.6018		0.5145			0.0199		0.1772	0.5867		

Table XIV Correlation Between Variables for Middle Eastern and North African Countries

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) trust	1.0000															
(2) govsize	0.6509	1.0000														
(3) unna_ggfce	0.5000	0.4038	1.0000													
(4) unna_ln	0.4204	0.2925	0.9881	1.0000												
(5) wdi_taxrev	0.2789	0.5568	0.6522	0.6640	1.0000											
(6) wdi_unemplt	-	-	0.1627	0.2882	0.0652	1.0000										
	0.4873	0.6489														
(7) ltemp_c	0.3524	0.3166	0.0424	-	0.0754	-	1.0000									
				0.0230		0.1330										
(8) education	0.2754	0.3271	0.9198	0.9128	0.7158	0.1821	0.1059	1.0000								
(9) edu_c	0.1520	-	-	-	-	-	0.0423	-	1.0000							
		0.0458	0.5817	0.6194	0.7009	0.2788		0.8329								
(10) wdi_incsh10h	-	0.0193	0.0957	0.1336	0.3182	-	-	0.1793	-	1.0000						
	0.2798					0.1189	0.8174		0.4237							
(11) wdi_imigs	0.5791	0.1553	0.7786	0.7386	0.1660	-	0.1526	0.7139	-	-	1.0000					
						0.0310			0.3630	0.1271						
(12) bci_bci	-	-	-	-	-	-	-	-	0.5557	-	-	1.0000				
	0.5524	0.4395	0.9849	0.9772	0.7172	0.1751	0.0774	0.8905		0.0560	0.7286					
(13) bci_c	-	-	0.0978	0.1427	0.0287	0.6751	0.3082	-	0.1963	-	-	-	1.0000			
	0.1315	0.1342						0.0269		0.5839	0.1743	0.1519				
(14) dr_ig	-	-	0.6674	0.7399	0.6440	0.4082	-	0.7777	-	0.5423	0.4612	-	-	1.0000		
	0.0340	0.1052					0.3604		0.8713			0.6600	0.1817			
(15) wvs_hap	-	-	-	-	0.0944	-	0.1167	-	-	0.1953	-	0.2660	-	0.2522	1.0000	
	0.1124	0.2489	0.2726	0.2324		0.1309		0.0305	0.3616		0.0788		0.5669			
(16) wdi_pop14	0.5248	0.0341	-	-	-	-	0.1715	-	0.5188	-	0.4624	0.1433	-	-	-	1.0000
			0.1068	0.1927	0.6042	0.5400		0.2502		0.3562			0.3764	0.4219	0.0242	

Appendix B : Test Results

Table I Hausman's Specification Tests –Hypothesis I

	Coefficients			
Variables	**(b) FE**	**(B) RE**	**(b-B) Difference**	**SE**
unna_ggfce	.0759192	.3140362	-.238117	.2160986
bci_c	.7904373	-.113553	.9039902	.2311989
dr_ig	.0411787	.0281273	.0130515	.0877312
wdi_imigs	-.49567	.0769997	-.5726697	.3231431
wvs_hap	-2.328921	-2.546126	.2172052	2.130023
wdi_pop14	.5717529	-.1225907	.6943436	.3073199

Test: Ho: Difference in coefficients not systematic
Chi2(6) = 31.58
Prob>chi2 = 0.0000
Cluster-robust Hausman test:
Chi2(6) = 14.61
Prob>chi2 = 0.0235

b = consistent under Ho and Ha obtained from the fixed effects model on: trust unna_ggfce bci_c dr_ig wdi_imigs wvs_hap wdi_pop14
B = inconsistent under Ha, efficient under Ho obtained from the random effects model on trust unna_ggfce bci_c dr_ig wdi_imigs wvs_hap wdi_pop14

Table II Hausman's Specification Tests – Hypothesis II

	Coefficients			
Variables	**(b) FE**	**(B) RE**	**(b-B) Difference**	**SE**
unna ggfce	.4438595	1.125897	-.6820375	.603864
edu_c	-.0175829	.0881638	-.1057468	-
ltemp_c	.085405	.0848504	.0005546	-
wdi_incsh10h	.6036527	-.6808108	1.284464	.4464042
bci_c	-.1438692	-1.021504	.8776353	-
dr_ig	.1383457	.6112011	-.4728555	.3283065
wdi_imigs	-1.921728	-.2743697	-1.647359	.4437815
wvs_hap	-23.01103	-5.872438	-17.13859	5.061544
wdi_pop14	-.2586204	.8235862	-1.082207	.887634

Test: Ho: Difference in coefficients not systematic
Chi2(9) = -7.23
Prob>chi2 = - [*Model fitted on this data fails to meet the asymptotic assumptions of the Hausman test*]
Cluster-robust Hausman test:
Chi2(6) = 19.17
Prob>chi2 = 0.0238

b = consistent under Ho and Ha obtained from the fixed effects model on: trust unna_ggfce edu_c ltemp_c wdi_incsh10h bci_c dr_ig wdi_imigs wvs_hap wdi_pop14
B = inconsistent under Ha, efficient under Ho obtained from the random effects model on trust unna_ggfce edu_c ltemp_c wdi_incsh10h bci_c dr_ig wdi_imigs wvs_hap wdi_pop14

Table III Heteroskedasticity Test – Hypothesis I

Modified Wald Statistic for Heteroskedasticity in FE model	
	Coef.
Chi-square test value	4.4e+32
P-value	0.0000

Test: Ho: homoskedasticity for all i

Note: Obtained from the fixed effects model on trust unna_ggfce bci_c dr_ig wdi_imigs wvs_hap wdi_pop14

Table IV Heteroskedasticity Test – Hypothesis II

Modified Wald Statistic for Heteroskedasticity in FE model	
	Coef.
Chi-square test value	2.1e+30
P-value	0.0000
Test: Ho: homoskedasticity for all i	

Note: Obtained from the fixed effects model on trust unna_ggfce edu_c ltemp_c wdi_incsh10h bci_c dr_ig wdi_imigs wvs_hap wdi_pop14

Appendix C : Robustness Tests

Table I Hypothesis I with Trust in Parliament

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	**ess_trparl**	**ess_trparl**	**ess_trparl**	**ess_trparl**	**ess_trparl**	**ess_trparl**	**ess_trparl**
unna_ln	4.416						
	(2.901)						
bci_c	-0.003	-0.011	0.036	0.065**	0.019	-0.045	0.036
	(0.065)	(0.067)	(0.054)	(0.026)	(0.066)	(0.072)	(0.054)
dr_ig	-0.182**	-0.176**	-0.137*	-0.071	-0.129	-0.302***	-0.137*
	(0.067)	(0.065)	(0.077)	(0.064)	(0.080)	(0.095)	(0.077)
wdi_imigs	-0.008	-0.002	0.044	0.113***	-0.002	0.064	0.044
	(0.060)	(0.054)	(0.049)	(0.026)	(0.070)	(0.039)	(0.049)
wvs_hap	2.691	2.956	2.551	0.944	3.743*	1.073	2.551
	(1.812)	(1.868)	(2.041)	(1.839)	(1.871)	(1.459)	(2.041)
wdi_pop14	0.036	0.042	0.086	-0.221	0.143	-0.204	0.086
	(0.224)	(0.221)	(0.303)	(0.292)	(0.268)	(0.262)	(0.303)
unna_ggfce		0.237					
		(0.147)					
govsize			0.077				0.077
			(0.358)				(0.358)
wdi_taxrev				0.124***			
				(0.021)			
wdi_expedu					1.350		
					(0.951)		
wdi_expmilge						-0.486**	
						(0.214)	
Observations	41	41	41	40	40	40	41
R-squared	0.497	0.508	0.399	0.699	0.554	0.624	0.399
Number of countries	28	28	28	28	28	28	28

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

Table II Hypothesis II with Trust in Parliament

Variables	(1) ess_trparl	(2) ess_trparl	(3) ess_trparl	(4) ess_trparl	(5) ess_trparl	(6) ess_trparl
unna_ln	-9.920***					
	(2.374)					
edu_c	-0.068***	-0.062***	-0.054***	-0.116***	-0.051***	-0.045**
	(0.010)	(0.009)	(0.013)	(0.018)	(0.009)	(0.021)
ltemp_c	0.030***	0.028***	0.012	0.009	0.018***	0.009
	(0.006)	(0.006)	(0.010)	(0.006)	(0.002)	(0.006)
wdi_incsh10h	-0.854***	-0.953***	-0.265**	-0.317**	-0.690***	-0.265***
	(0.170)	(0.200)	(0.112)	(0.136)	(0.074)	(0.091)
bci_c	0.088***	0.114***	0.001	0.104**	0.022	-0.021
	(0.029)	(0.036)	(0.056)	(0.048)	(0.022)	(0.070)
dr_ig	-0.069	-0.099**	-0.146**	0.465**	-0.182***	-0.214
	(0.045)	(0.043)	(0.068)	(0.181)	(0.028)	(0.158)
wdi_imigs	0.142***	0.146***	0.009	-0.097***	0.126***	0.033
	(0.038)	(0.039)	(0.042)	(0.032)	(0.027)	(0.039)
wvs_hap	-1.995***	-2.857***	-0.305	2.349**	-1.117	-0.168
	(0.572)	(0.705)	(1.044)	(1.133)	(0.698)	(1.070)
wdi_pop14	0.458**	0.504**	0.030	-0.410**	0.287**	0.023
	(0.185)	(0.202)	(0.225)	(0.185)	(0.126)	(0.242)
unna_ggfce		-0.524***				
		(0.134)				
govsize			-0.088			
			(0.402)			
taxrev_c				0.039		
				(0.041)		
wdi_expedu					-1.734***	
					(0.373)	
wdi_expmil						-0.379
						(0.983)
Observations	40	40	40	39	39	40
R-squared	0.971	0.970	0.872	0.934	0.969	0.874
Number of countries	28	28	28	28	28	28

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

Table III Dynamic versus Static

Variables	(DYN 1) Trust	(FE 2) trust	(DYN 3) trust	(FE 4) trust
trust $_{t-1}$	0.297		0.579	
	(0.504)		(0.479)	
unna_ggfce	3.091	0.076	0.794	0.444
	(2.990)	(0.246)	(1.985)	(0.457)
edu_c			-0.234	-0.018
			(0.468)	(0.117)
wdi_unemplt			0.148	0.085
			(0.125)	(0.081)
wdi_incsh10h			-2.859	0.604
			(3.103)	(0.598)
bci_c	-5.576	0.790	-4.691	-0.144
	(3.816)	(0.510)	(3.033)	(0.495)
dr_ig	-0.346	0.041	-0.515	0.138
	(0.728)	(0.181)	(0.920)	(0.318)
wdi_imigs	0.441	-0.496	0.602	-1.922***
	(2.954)	(0.409)	(1.254)	(0.331)
wvs_hap	3.726	-2.329	29.878	-23.011***
	(36.400)	(5.497)	(29.054)	(6.604)
wdi_pop14	-0.571	0.572	1.506	-0.259
	(0.854)	(0.595)	(2.205)	(0.706)
Observations	134	260	42	90
Number of countries	66	99	28	54
R-squared		0.062		0.579
F-Statistic	13.20	2.089	4444	14.97
Prob>F	0.0000	0.0613	0.0000	0.0000
BIC		1608.557		
MMSC-BIC	-24.053594		-13.249422	459.5901

Note: We utilize MMSC-BIC as the selection criteria following the framework of Andrews & Lu (2001) and a standard BIC for the static models. Accordingly, we can only compare selection criteria within dynamic models and within static models and not between them.
Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1