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TOWARDS A MODEL OF ECONOMIC CRISIS, SOCIAL TRUST & CORRUPTION

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Master Thesis, Master of Science in Economics and Business Administration,

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Abstract

In this paper, we uncover the relationships between social trust, corruption and economic crisis. Our study is a combination of both theory and quantitative analysis. Our theoretical foundation is a collection of numerous studies from many different academic fields, especially from political science, corruption study, sociology and economics. We then further strengthen our arguments with both descriptive analysis and regression analysis of secondary data. Our dataset is collected from "Quality of Government Institute" and "The Behavioral and Financial Stability Project", and includes 11364 observations. Based on our quantitative findings, we discover that social trust is correlated with the duration of economic crises. Furthermore, we discover that equality, which plays an important role in the development of social trust, is correlated with GDP growth rate, inflation rate and public debt but not with unemployment rate. GDP growth rate, inflation rate, public debt and unemployment rate are four economic crisis indicators that were established based on our in-depth understandings of the theoretical foundation. Connecting our theoretical stance with our empirical evidence, we then propose several possible explanations for the findings and clarify theoretical as well as practical implications of the findings.

Contents

Introduction

We hear it from time to time in the media that corruption hinders economic growth and keep corrupt nations from advancing further on their economic journey. There is no doubt that corruption plays a key role in the development level of a country. There is not any country that is free of corruption, nor of the responsibility for finding international solutions to it. The problem is generally found to be more widespread in low income countries than in wealthier nations (Søreide, 2016). But what factors determine the wealth of a nation? A general consensus seems to be that technology, natural resources (such as land), physical capital and human capital constitute such factors (Jorgenson, 1991). However, from a social capital theorist perspective, there might be positive and negative social forces within each society that can harm or strengthen the affluence of a nation (Ostrom & Ahn, 2009). From this point of view, a less familiar factor emerges and plays a key role in assessing the level of wealth. This factor is social trust. The concept of social trust is also very engaging. Research findings reveal that there is a strong relationship between corruption and social trust, and that these two factors interact with each other (Rothstein, 2005).

There are some possible links connecting economic crisis with corruption and social trust. Corruption and social trust are closely linked together through inequality. This is because dishonest government results in higher inequality and lower social trust (Rothstein, 2005). According to Galbraith (1997), prior to an economic shift, economic crises are often followed by scandals such as large-scale corruption, revealing the prevalence of malpractices in the administration of public and private sectors. The US housing bubble, which had been found to be created by the irresponsible supply of mortgages, exploded in 2007 followed by a massive global financial crisis. This is another compelling warning of how corporate cronyism can challenge any democracy (Søreide, 2016). Moreover, a decline in mental health due to stress, depression or an increase in inequality suggest that poor labor market conditions may impact indirectly on crime (Dix-carneiro & Kovak, 2015). There are several studies on the relationship between crime and employment, earnings or labor market conditions (see Raphael & Winter-Ebmer, 2001; Lin, 2008; Fougère, Kramarz & Pouget, 2010). Despite the evidences that economic crisis and crimes

are potentially related, there are less findings focus on economic crisis and corruption. As reported by Hunt (2007), families affected by crisis or experiences misfortunes, such as job loss and wage cut, are more prone to pay bribe to public officials. On the other hand, trust and perceptions about honesty are strongly correlated with an increase in inequality. This indicates that extensive perceptions during economic crisis leads to a decrease in trust (Uslaner, 2012).

According to our knowledge, there is not many studies conducted in this area. Therefore, we are inspired to investigate the connection between economic crisis, social trust and corruption in society. Moreover, our theoretical foundation needs to be built on the basis of combining studies from different academic subjects, since the topic of our choice is new and unfamiliar. In the current paper, we include both recent and long-established academic materials to describe a general picture about our arguments and set a foundation for our conceptual framework. We then provide an empirical analysis based on public data that derives from multiple academic sources. Our research question is as follows:

> "*How are the concepts of economic crisis, social trust and corruption related to each other?*".

Our thesis explores in detail the characteristics as well as inter-connections behind the three concepts, we hope to contribute some empirical evidences about their relations. We also hope to gain a better understanding of what constitutes an economic crisis and how these concepts can affect the consequences of an economic downturn. The results may help governments and organizations to give better recommendations, to improve policies or to indicate needed actions in order to reduce the severity of the consequences during the economic crisis. In doing so, nations may increase their financial stability in order to be able to contribute to further economic growth.

In the next section, we present our theoretical framework with attached hypotheses. In this part we conduct a literature review about what has been done and look at the most recent studies on social trust, economic crisis and corruption. Then we examine other behaviors and areas that have been affected by economic crisis, besides trust and corruption. Next, we look at how social trust, corruption and economic crisis are related to each other and what kind of research has been done before. Finally, we present our hypotheses and conceptual framework based on what we have found in the theory section. Section 2 presents our methodology and empirical approach. In this part we start with the presentation of the original databases that are used in the present research. Then we introduce the analytical techniques and the adjustments made while structuring the databases. Finally, we introduce our empirical model to be used in the econometric part before discussing the weaknesses of the data. Sections 3 and 4 focus on the results of our descriptive and econometric analysis. The purpose of the descriptive analysis is to help the readers understand the variables. Moreover, we also utilize these materials to illustrate some of the possible correlations among the variables in periods of economic crisis and non-economic crisis. Furthermore, the purpose of the econometric analysis is to consider whether some indicators of economic crisis is related to social trust and corruption when there are at least one crisis presents. In section 5, we discuss about the results from Section 4 with respect to theoretical implications, practical implications, limitations and further research. Finally, we will present a conclusion of the thesis.

1 Theory

1.1 social trust

In simple words, s*ocial trust* is the faith of people in a society to which they belong (Taylor, Funk, & Clark, 2007). The study of social trust has generated a lot of attention since the publication of Robert Putnam's two books: *Making Democracy Work* (1993) and *Bowling Alone* (2000) (Rothstein, 2013). One reason for the newly developed interests in social trust is that it is found to be positively correlated with many other factors in social studies (Rothstein, 2005). Citizens that have high trust in their communities are believed to have positive views towards democratic institutions. They also participate more actively in politics, give more to charity and show more empathy towards minorities in their societies. In addition, high trust people are found to be more satisfied with their own lives as well as to have greater belief in their own abilities to influence their own lives (Leung, et al., 2011; Dinesen & Thisted, 2013). On a societal level, high trust citizens are found to have better democratic institutions, to possess more open economies, to have higher economic growth and to have less crime and corruption (Bjørnskov, 2009; Richey, 2010; Rothstein, 2013). However, it must be noted that the causal relationship between social trust and these highly desirable variables mentioned above is different from their statistical correlations in these studies. The level of social trust's importance in social studies has been increased lately (Rothstein, 2005).

1.1.1 How social trust is created

The causes and roots of social trust are still debated among social researchers (Rothstein, 2013). There are two main concepts about the foundation of social trust. The first one is the society-centred approach (Hooghe & Stolle, 2003). Researchers, who share this idea, believe that social trust is generated among citizens of a society by their interaction with social activities, especially through voluntary activities. However, this approach does not align well with empirical researches (Rothstein, 2013; Delhey & Newton, 2003). There is a self-selection problem in that, people who participate in voluntary associations, are already high-trust citizens. Additionally, voluntary activities are not contributing to the improvement of social trust among organization members (Stolle, 2003). Another approach holds that social trust takes its foundation from the

level of equality in a society (Rothstein, 2005). Equality comes in two types: economic equality and equality of opportunity. Economic equality is easier to measure since it can be quantified by looking at how resources are redistributed among members of a society. Equality of opportunity, however, must be considered as more crucial than the latter. The reason is that even in the case of economic inequality, policies that support equality of opportunities can play an important role in improving social trust. One example of this is investing in universal education programs. This is because education has the potential to strengthen the economic prospects, it is found to be one of the most critical factors to enhance social trust (Brehm & Rahn, 1997). The second one is institution-centred approach, it explains the origins of social trust from another perspective. Supporters of institution-centred theory believe that honest, incorrupt and efficient government are the key factors for the development of social trust in a society (Rothstein, 2013). These supporters found a strong correlation between high-trust societies and incorrupt government. Using survey data, they also conclude that honest political institutions positively contribute to interpersonal trust (Bjørnskov, 2009; Freitag & Buhlmann, 2005).

1.1.2 How social trust is related to economics

From an economic point of view, social trust seems to have positive effects on the economy of a nation. Social trust reduces the cost of interference, from a third party, to transactions among economic actors (Uslaner, 2002). It facilitates more transactions while decreasing the costs of controlling (for example: from government intervention). The resources, which are saved from these costs, can be invested in other beneficial activities such as education and infrastructure that contribute to the overall growth of the economy (Graeff & Svendsen, 2013). In a high-trust environment, time and effort are utilized more effectively because investors do not have to worry about the validity of their agents. For this reason, they are able to achieve higher productivity (Knack & Stephen, 2001). Social trust is also found to be associated with the enhancement of human capital (Özcan & Bjørnskov, 2011). There are evidence that trust affects education, rule of law and government quality. Together they increase the development on investment rate and provide positive impact on economic growth (Bjørnskov, 2012). Furthermore, social trust can improve human capital, enhance government efficiency and strengthen the positive effects on economic growth (Deng, Lin, & Gong, 2012).

On the other hand, low social trust may slow down economic growth. To explain the differences between the wealth of societies, Fukuyama (1995) indicates that for a country to become prosperous, business should be conducted informally and flexibly on the foundation of trust. China, at that time, was classified as a low-trust country compare to countries such as Germany, Japan and USA. The low-trust factor is used by Fukuyama to explain why many Chinese companies are limited to family network, preventing the formation of large private owned corporations, which can further expand the economy. Low social trust can also hurt the market. According to Zhang (2003), during his time in China, he observed that every retailer checkout and bank counter are equipped with counterfeit defectors. The need to be equipped with these machines might reflect how low the level of trust was in the Chinese society at the time. Low trust in retail market hurts both the consumers and the retailers. For example, consumers will be more reluctant to purchase domestic products due to low trust in product quality. While retailers will be more hesitant to offer tolerant return policies, in fear of these policies may be abused by the consumers (Xianghong, 2009).

1.2 Corruption

When it comes to definition, the term "*corruption*" can be interpreted and explained in many ways. According to Longman Dictionary of Contemporary English (2019), corruption is defined as dishonest, illegal or immoral behavior, especially from someone with power. The term is explained in more detail by Tina Søreide (2016). According to Søreide, corruption is the trade in decisions that should not be for sale. The word is associated with illegal activities that abuse authority to gain personal benefits. Corruption can also be applied for culprits that demand and facilitate trade in decisions through bribery. Consequently, they weaken the foundation of government authority and destroy the basis for state development. For its extensive consequences, corruption is considered a very serious form of crime.

1.2.1   Causes of corruption

There is no country in the world that is free from corruption. However, the problem is more severed in low-income countries than wealthier nations (Søreide, 2016). Many researchers believe that corruption in higher-income countries or countries that have better performing institutions may be underestimated. The reason is that in these countries, corruption happens in more subtle forms and usually with better concealment (Søreide, 2016). The rate of extortive corruption is found to be higher in poor countries, while the rate of collusive corruption is not significantly related to income levels (Søreide, 2016). Nevertheless, the types of corruption that are usually studied may not be the most dangerous ones. Cronyism, which is the connection between powerful business leaders and politicians, is more destructive and more difficult to measure (Lambsdorff, 2015). There are evidence that poorer countries with less effective government are also suffering from cronyism (Fisman & Miguel, 2010). Corruption on a political level is found to be particularly detrimental for development, because politicians and business leaders exert excessive control over resources that are imperative for development (Acemoglu, Johnson, & Robinson, 2001). Natural resources also have a direct link to the development of corruption. Countries that possess a high amount of minerals and crude oil are found to suffer from an increasing level of corruption (Aslaksen, 2007; Andrea Petermann, 2007). Many researchers believe that a "resource curse" is caused by combining natural resources with weak government, stimulating patronage and rent-seeking. Patronage is the usage of state resources to reward political supporters for the purpose of securing political power. Rent-seeking is the seeking of improving one's share from existing resources without creating new wealth for the society (Robinson, Torvik, & Verdier, 2006; Collier & Goderis, 2007). Rent-seeking dwindles economic efficiency because skilled agents utilize their time and capability to capture the rents rather than participate in productive activities. Both patronage and rent-seeking can be classified as forms of corruption (Kolstad & Wiig, 2011).

1.2.2   How social trust is related to corruption

From a political point of view, incorrupt and honest governments seem to promote social trust inside a community, while corrupt and inefficient governments destroy trust among people (Rothstein, 2005; Rothstein, 2013; Sun & Wang, 2012). By interacting with corrupt officials,

citizens not only lose trust in the institutions but also diminish trust to other people in their communities (Rothstein, 2013; Sun & Wang, 2012). According to Bo Rothstein (2013), one of the reasons behind this phenomenon is that it is impossible for a normal citizen to measure the trust of all the people in a society. Citizens generalize their belief about the trustworthiness of public officials to the whole population. If they have a negative experience with public officials, it would be easy to assume that other people cannot be trusted. Additionally, they relate to other people as not being trustworthy, because they believe others also engage in corrupt activities through contact with corrupt public officials. Furthermore, they consider themselves as corrupt individuals, and hence lose trust in themselves. For this reason, there is no doubt that they also lose trust in others.

There is also some linkage between corruption and inequality that affects social trust indirectly (Uslaner, 2012). The effects can be summed up in a simple illustration as follows (see Figure 1):
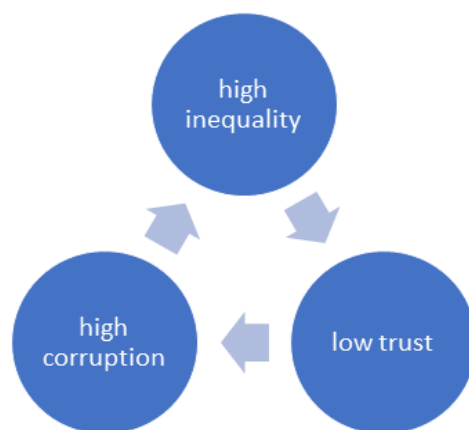

Figure 1: The mechanisms of the relations between corruption, trust and inequality

The link between equality and trust can be casually explained by the following reasons (Rothstein, 2005). Firstly, economic inequality and low equality of opportunity increase pessimism among poor people. Because they feel that societies do not treat them fairly,

especially in the education and labor market, they start losing trust in others, whom possess more resources. Secondly, when the level of inequality is high, people do not believe that they share a common destiny. The income gap between the rich and the poor further separates the two groups, because they do not see themselves as part of a larger entity. Instead, this separation strengthens the negative stereotypes about each group, degrading the level of trust even lower and closing the gap between them become even more difficult (Boix & Posner, 1998).

The link between dishonest and corrupt government that lead to higher inequality and lower social trust can also be described by the establishment of universal welfare programs. Universal welfare programs, which reward all people in a society equally regardless of their income, are more effective than means-tested programs in term of creating social equality and trust. Means-tested programs only reward specific groups within a society through some selection methods (Rothstein, 2005). However, universal welfare programs are rarely established in a country that has a high level of corruption. According to Rothstein (2005), the reason is that universal welfare programs require a high level of understanding between different groups in a society. In a society with low trust and high corruption, the poor do not want to share any benefits with the rich. According to the poor, the rich gain their wealth by unfair advantages (such as connection) or dishonest activities. For that reason, people with less wealth will demand some type of resource redistributions from the rich to the unfortunate individuals. For them, there is no reason for wealthy individuals to receive any benefits from the state. Furthermore, the superior effectiveness of universal welfare programs over means-tested policies is very hard to explain to the mass society, especially the low-income and less educated groups (Rothstein, 2005). In this circumstance, politicians cannot gather enough support from the public to initiate universal welfare programs. Consequently, low trust and highly corrupt countries usually opt for means-tested policies that worsen the situations, since means-tested welfare programs create massive bureaucracy processes that are wasting time and resources (Tella & MacCulloch, 2009). These programs create a sense of resentment from the poor by treating them differently compare to other groups in a society. To qualify for these programs, the low-income individuals must go through some selective methods, which may destroy their dignity during the process (Soss, 2001). This effect may humiliate the unfortunate individuals and further diminish their trust in

people with higher income. On the other hand, these problems can be solved easily by universal welfare programs. Unlike means-tested programs, universal welfare policies distribute benefits equally to everyone. There is no need for a hassle bureaucracy process to select the "poor enough" individuals (Kumlin & Rothstein, 2005). These policies save time, money and protect the integrity of all the people. To sum up, these effects mentioned above create a social trap of inequality and low trust for societies that already have a high level of corruption. The trap seems impossible to escape, because policies that are implemented to tackle these social issues will only enlarge the never-ending problems (Uslaner, 2012).

Additionally, the link between these three factors can be described by distinguishing two kinds of trust, which are generalized trust and particularized trust. Generalized trust refers to the trust in all the people regardless of differences between groups in a society. In contrast, particularized trust reflects the close relationship among similar individuals, with regard to economic situation, gender and social class. Particularized trust also implies the distrust to the individuals outside one's social circle (Uslaner, 2002). Some may argue that for a corrupt society to function properly, individuals must form a broad network of connections comprised of people that they can trust. For example, corrupt actors need to conceal their illegal practices, so they limit other people from accessing to their network (Lambsdorff, Taube, & Schramm, 2005). However, corruption seems to only exacerbate the level of trust (Eek & Rothstein, 2006). Corruption can only promote particularized trust, or in-group trust, rather than generalized trust. In a corrupt society, public officers will only reward the people who show loyalty to them (Rothstein, 2005). Corrupt politicians also steal resources from the state to enrich themselves and their immediate business circle (Uslaner, 2012). The rich only get richer through corrupt activities. While the poor will start losing trust in the society as a whole and gaining more sympathy towards their low-income counterparts (Uslaner, 2012; Rothstein, 2005). Particularized trust is the exact opposite of social trust, because it damages the relationship of people from different backgrounds (Uslaner, 2002). In a society, where people concern less for individuals outside of their social group, social trust cannot exist because each group only care about their own interests without concerning the needs of other groups. They may even perceive demands from other groups in conflict with their own well-beings, leading to more resentment and social conflict. By adding

more salt to the wounds, eventually, the rich and the poor cannot reach a common understanding and further separate the two groups. Corruption maintains high level of inequality that worsen social trust in an endless and continuing cycle that seems impossible to break (Uslaner, 2012).

1.3 Economic crisis

In the discussion of economic crisis, it is necessary to understand the differences between the different types of crises and the key elements in each crisis. It is also necessary to distinguish between a business cycle, an economic shock and an economic crisis, because these terms are very easily to be misunderstood.

A good explanation of a *business cycle* is from Burns & Mitchell (1946):

> "Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consist of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions and revivals which merge into the expansion phase of the next cycle."

A business cycle or a *recession* is defined by NBER as follows: "significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales". The difference between a recession and a *depression,* is that in the latter the cumulative income declines in absolute terms. The key elements of a depression contain withholding of investment, an increase in unemployment, and a decrease in prices and profits (Jones, 2001).

An *economic shock* is defined as "Events that impact the economy which originate from outside it. They are unexpected and unpredictable" (Nasdaq, 2019). On the other hand, an *economic crisis* is defined by Starke, Kaasch & Horren (2011) as "a sudden, and often unexpected, deterioration of most key macroeconomic indicators, including GDP growth, unemployment levels, inflation rate and public debt". An economic crisis may be caused by excessive

speculation instead of realistic expectations in the financial markets (Jones, 2011). Furthermore, when crises are a part of global events, they may have a bigger negative impact, since they tend to be bigger in size and more unpredictable. *International crises* are characterized by which they affect a large amount of countries globally and are caused by external shock (Starke et al., 2011). An example of an international crisis is the financial crisis of 2007, which was caused by unfortunate incidents in the global financial markets. An increase in financial stress and a decrease in economic activity, leading to a worldwide impact for most countries, especially the developed countries and emerging markets (Claessens, Dell'Ariccia & Laeven, 2010). The indicators of a crisis remain unchanged regardless of whether it is at a global or a national level. The more recent crises are far worse and affect more often on a global level, due to technology development and the instantaneous spreading of information (Reinhart & Rogoff, 2009; Jones, 2001).

A *financial crisis* is defined by "large-scale defaults of financial and non-financial enterprises, usually accompanied by falling incomes and prices in the economy as a whole" (Jones, 2001). The increase of interrelatedness between financial markets results in a global crisis (Claessens et al., 2010). Key elements of a financial crisis include a sudden and unpredictable increase in asset prices, excessive debt as follows by credit booms, accumulation of marginal loans and systemic risks (Claessens et al., 2010). Furthermore, a *banking crisis* is defined as "significant signs of financial distress in the banking system, and significant banking policy intervention measures in response to significant losses in the banking system" (Laeven & Valencia, 2013). On the other hand, when a banking crisis is becoming more severe as in closure, merging or takeover by the public sector, then it is called a *systemic crisis* (Reinhart & Rogoff, 2009). According to Reinhart & Rogoff (2009), an *inflation crisis* exists when an annual inflation rate is 20 percent or higher.

The duration of a crisis increases with the complexity of a crisis, and the complexity is related to the severity of the impact (Laeven & Valencia, 2018). For example, longer and more complex crises have been associated with larger capital outflows and worse outcomes in terms of output loss and inflation. Laeven & Valencia (2018) defined *crisis duration* as the beginning and the

end of a crisis. The end date for a crisis period is defined as the year before both real GDP growth and real credit growth are positive for at least two consecutive years.

1.3.1 Economic crisis and its consequences

Research on the financial crisis of 2007-2008 found that the crisis affected countries and the individuals of different social classes unequally (Sachweh, 2017). Normally, we associate crisis impact with an increase in state responsibility, greater welfare support and redistribution (Blekesaune, 2013; Naumann, 2015). However, this association is not homogenous, because of the differences in social class positions, national economic conditions and social spending levels (Chzhen, 2016; Mertens & Beblo, 2016; Sachweh, 2017). On an individual level, stronger perceived crisis impact is associated with more favorable attitudes towards welfare state support (Jeene, van Oorschot & Uunk, 2014; Fraile & Fons, 2005). However, welfare state support is less related to perceived crisis impact when social spending is higher, indicating that encompassing welfare states reduce the subjective impact of the crisis (Blekesaune, 2013).

Unemployment is generally seen as "class risks", and therefore, social consequences of economic downturns are distributed unevenly among individuals (Eurofound, 2012; Rueda, 2012; Sachweh, 2017). In general, members of disadvantaged social groups (such as low-income earners, low-skilled workers and young people), are exposed to greater social risks during economic downturns than members of privileged groups (OECD, 2014; Chzhen, 2016). This is because disadvantaged groups have less economic resources as a buffer for material consequences of economic downturns, especially over a longer period (Kluegel, 1988). Therefore, they are more dependent on state benefits to maintain their standard-of-living than members of privileged groups. Additionally, people from disadvantaged groups often have a smaller social network, which could work as an additional social support during economic crisis (Reeskens & van Oorschot, 2014). Moreover, the increase in social spending in European countries was smallest in the countries that were most affected by the crisis. This indicates that there are differences in countries' capacities to handle the effects of economic downturns (Leschke & Jespen, 2012). European welfare states still differ in their institutional design and

generosity, as well as in their social and labour market policy responses to the crisis (Scruggs & Allan, 2006; Starke, Kaasch & Van Hooren, 2013; Van Hooren, Kaasch & Starke, 2014).

Hariri, Bjørnskov & Justesen (2016) study on developing countries indicates that economic shocks, such as unanticipated currency devaluations, have a strong and negative causal effect on how people rate their living conditions and sense of well-being. This research is consistent with earlier work stating that a financial crisis adds a non-negligible cost to individual's well-being, and that macroeconomic movements strongly impacts on the happiness of countries (Di Tella, MacCulloch & Oswald, 2003; Montagnoli & Moro, 2014). Moreover, Hariri et al. (2016) suggest that respondents react stronger to a shock when they consume media news more often and have higher education. The impact of a shock may be constrained by an individual's information and their cognitive sophistication, which is based on the level of education in their study. Furthermore, if individuals have little information about the economy, their expectations will adapt more gradually as the consequences become more observable. Therefore, how fast they adjust their expectations is likely to depend on an individual's information and education (Hariri et al., 2016).

The financial crisis of 2007 is associated with an increase in suicide attempts (Barr, Taylor-Robinson, Scott-Samuel, McKee & Stuckler, 2012). Local areas with a sufficient increase in unemployment, such as during an economic crisis, are significantly related to an increase in suicide by men. The research of Katikireddi et al. (2011) indicates a connection between the financial crisis and a decline in men's mental health. This decline is not particularly a result of an increase in unemployment, since the decline in men's mental health is also present among the employed. Furthermore, the results from Gili et al. (2013) suggest that there is a significant increase in alcohol, depression and anxiety related disorders after the financial crisis of 2007. This indicates that the crises increase the likelihood of mental health disorders and alcohol abuse, especially when households encounter job loss and struggle with mortgage payment. The financial crisis also impacts fertility rates, Sobotka, Skirbekk & Philipov (2011) indicate that the crisis has a negatively impact on fertility due to a decrease in birth rates. They argued that fertility during crises varied on different conditions such as age, sex, socioeconomic status and

ethnicity. Hence, they suggest that in economic downturns the decline in fertility is partly due to substantial variation in the opportunity cost of having a child.

Another interesting case relating to the financial crisis of 2007 focused on how the crisis affected Nigeria. The crisis had severe negative impacts on objective macroeconomic conditions, such as government revenue, poverty and employment (Agri, Mailafia & Umejiaku, 2017). Moreover, the crisis affected socioeconomic conditions, such as standard of living, general wellbeing and education, and therefore, had negative impact on the stability of families. Furthermore, life expectancy fell, due to an increase in crime rates, maternal and infant mortality rates. There was moreover a bad faith in the government and in the economy in general, suggesting that the consumer confidence was lost. Interestingly, the paper concludes that Nigeria experienced internal problems, such as corruption in the political class, over-dependence on oil and government revenues. Factors like these caused the crisis in many ways.

1.4 Economic crisis, corruption and social trust

In the next section we explain how corruption, social trust and economic crisis are connected to each other. First, we present earlier works in the areas of corruption, economic crisis and social trust. Next, we describe the hypotheses for this research paper. Finally, we summarize the hypotheses in a conceptual framework.

1.4.1 Corruption, crime and economic crisis

Previous studies suggest that many areas experience a downturn in labour market conditions when they are exposed to foreign competition (Autor, Dorn & Hanson, 2013; Kovak, 2013). The relationship between crime and labor market conditions, employment and earnings is covered to a high degree (see Raphael & Winter-Ebmer, 2001; Lin, 2008; Fougère, Kramarz & Pouget, 2010). Furthermore, Dix-Carneiro and Kovak (2015) discover that the "long run"-recovery of employment rates after an economic shock, is fully induced by a development of the informal sector. This suggests that informal employment keeps individuals from doing crime. It also indicates that labor regulations, which reduce informality and increase unemployment, can

intensify the level of crime related to economic crisis. Still, local crisis that caused a reduction in labor demand may affect crime in different ways. Local economic crises may also decrease government revenues and affect the supplying of public goods. This may directly impact crime rates (Dix-carneiro, Soares & Ulysse, 2017). Moreover, a decline in mental health due to stress, depression or inequality, suggest that poor labor market conditions have an indirect impact on crime. (Fajnzylber, Lederman & Loayza, 2002; Fazel, Wolf, Chang, Larsson & Goodwin, 2015). Finally, crises caused by liberalization are causally and reliably related to crime rates in the short and medium runs, but this effect disappear in the long run (Dix-carneiro et al., 2017).

Until now, we have only been looking at economic crisis and crime, and there is no doubt that these factors are related. Focusing on only crisis and corruption, there are less evidence. Nevertheless, Ivles & Hinks (2015) found that people affected by crisis are more prone to bribe a wide range of public officials than non-affected people. Additionally, they are bribing because the public officials are asking them to do so, suggesting that people are less likely to bribe out of gratitude. Moreover, people that are most affected by the crisis, in terms of consequences such as job loss and wage cut, are more likely to pay bribes. This result indicates that a decline in material well-being relates to a higher possibility of being involved in bribery. The finding is consistent with Hunt's findings (2007), which reveals that people whom experienced misfortunes, for example job loss and robbery, are more likely to bribe public officials. Ivles & Hinks (2015) found that people are more prone to bribe when they are wealthier and have higher anticipated income. These results corroborate earlier findings, suggesting that wealthy people are more likely to involve in corruption (Guerrero & Rodriguez-Oreggia, 2008; Hunt & Laszlo, 2012; Mocan, 2008). All in all, negative income shocks and greater wealth are presumably related with increase in corruption.

1.4.2 Social trust and economic crisis

As mentioned above, there are lots of empirical evidences on how macroeconomic shocks affect physical and psychological conditions. The financial crisis of 2007 is related to deteriorating mental health, for instance it increased the likelihood of committing suicide. It is also related to declining birth rates and is associated with disorders related to alcohol and anxiety. Moreover,

the financial crisis is associated with less trust in national and supranational institutions (Roth, Nowak-Lehmann & Otter, 2011). Furthermore, it has been observed that inflation did not matter on an individual level during a crisis, since individuals are more worried about the consequences of the impact. Additionally, trust will be reduced when the ratio of debt over GDP and unemployment increase (Roth et al. 2011). Uslaner (2010) suggests that trust and perceptions about honesty are strongly correlated to an increase in inequality. This indicates that during a crisis, people who are already worse-off are getting more worse-off and that wealthier people seem to stay unaffected. These reasons lead to a decrease in trust.

Generally, confidence favors objective information, external regulations, contractual agreements, as well as rational decisions (Tonkiss, 2009). On the other hand, trust favors subjective perceptions, moral sanctions, informal agreements and non-rational choices. The more absence the mechanisms of confidence is, the more abundant the reliance on trust becomes. The reason is that in the absence of reliable mechanisms of confidence, people depends on trust to deal with risk in order to make decisions. The lack of confidence mechanisms can lead to a financial system crisis, because of the failure or distortion of information, contract and regulation. For example, a significant distortion of information about the market can activate false or misleading price signals. In this way a stock market crisis becomes a trust crisis (Tonkiss, 2009). Furthermore, uncertainty in the news may reduce customer confidence, due to lower expectations or that it makes people more pessimistic (Svensson, Albæk, van Dale & de Vreese, 2016; van Dalen, de Vreese & Albæk, 2017).

We have seen how several existing studies examine the connection between macroeconomic shocks and financial crisis, and how it affects objective conditions or experiences from an individual level. We have also looked at how macroeconomic shocks affect crime, and especially how economic crises and corruption are related. Still, there is little attention paid to how trust, specifically social trust, and economic crisis are connected and how this relationship is tied to corruption. Therefore, in the next section we have developed some hypotheses to test how social trust, corruption and economic crisis may be related mapping out a conceptual framework.

1.5 Hypotheses and conceptual framework

The financial crisis of 2007 is associated with less trust in national and supranational institutions (Roth et al., 2011). Moreover, the results indicate that during a crisis unemployment leads to a decrease in trust, since individuals are more worried about crisis-inflicted consequences. Also, trust and perceptions about honesty are strongly correlated with rising inequality (Uslaner, 2010). This leads to a decrease in trust during crisis, when extensive perceptions about people who are already worse-off are getting more worse-off and wealthier people seem to get away without affliction. However, these studies are mostly about trust in general, and not specifically about social trust. Still, we believe the same conditions are applied for both types of trust.

Social trust decreases the cost of controlling between economic agents, so that businesses can acquire more resources to undertake the backlashes from the crisis (Uslaner, 2002; Knack & Stephan, 2001). Additionally, high social trust means that the country possesses superior institutions and government. An honest and incorrupt government will make better decisions to protect its citizens from harmful effects of an economic crisis (Rothstein, 2013). For example, social spending was smallest in the European countries that were most affected by the financial crisis, suggesting that countries differ in institutional design, generosity, social and labour policies responses to the crisis (Leschke & Jespen, 2012; Scruggs & Allan, 2006; Starke et al., 2013; Van Hooren et al., 2014). Members of disadvantaged groups are exposed to greater social risks during an economic crisis, since they have less economic buffer and a smaller social network. An effective government will be able to reduce the social risk tied to such a situation (OECD, 2014; Chzhen, 2016; Reeskens & van Oorschot, 2014). Furthermore, social trust develops social agreement among different social classes (Rothstein, 2005). As a result, people are more willing to cooperate for the common good, reduce the risks of social disintegrate during the crisis and improve the country's immunity against economic crisis.

High social trust will reduce inequality on an individual level. Perceptions of crisis and inequality are correlated (Uslaner, 2010; Uslaner, 2012). Therefore, we believe that if a country

has high social trust before the impact of a crisis, it will reduce the feeling of inequality during a crisis. This suggests that perceptions of crisis will be decreased when people have higher trust, especially in the government and its capacities to handle the effects of economic crisis. Hence, we believe that the impact of economic crisis is lessened by higher trust. *Economic crisis* is defined by Starke et al. (2011) as "a sudden, and often unexpected, deterioration of most key macroeconomic indicators, including GDP growth, unemployment levels, inflation rate and public debt". The first hypothesis is as follows:

> **Hypothesis 1:** Social trust has an effect on economic crisis by correlating positively with **a)** GDP growth, negatively with **b)** unemployment, **c)** government debt or **d)** inflation.

We hypothesize that societies with higher social trust and less corruption will enjoy shorter time of crisis compared to their counterparts. On the other hand, high corruption and low social trust intensify the crisis duration. Several research findings agree that social trust plays a key role in the development of a country (Rothstein, 2005). High level of social trust is found to be correlated with stronger democratic institutions, higher economic growth, while the level of crime and corruption is lower (Bjørnskov, 2009; Richey, 2010; Rothstein, 2013). Social trust is also rooted in an honest and incorrupt government (Rothstein, 2013; Bjørnskov, 2009; Freitag & Buhlmann, 2005). For this reason, controlling cost between economic agents is considerably lower in high trust communities (Uslaner, 2002). Also, social trust reduces interference from governments and encourages business transactions. Infrastructure and welfare policies are benefited because governments have larger funds to invest in them (Graeff & Svendsen, 2013). We believe that social trust can counteract the consequences of an economic crisis to a certain extent, because efficient governments can detect the errors faster and can manage challenges better. Furthermore, everyday businesses may even take advantage of the crisis to restructure their organizations, and improve technology as well as human resources. Additionally, low level of corruption means that public funds can be utilized more optimally for the recovery of the country.

On the other hand, lack of trust may increase the gap between rich and poor, and most importantly promote corruption (Uslaner, 2012). Countries with a high level of corruption often poorly utilize their potential to uplift the economy (Søreide, 2016). There is evidence showing that economic crisis presents serious challenges toward national security, since it increases crime levels (Dix-Carneiro & Kovak, 2015). Additionally, corruption reduces a country's capability to protect its national resources and make them more vulnerable to embezzlement (Kolstad & Wiig, 2011). Henceforth, during economic crisis, high corruption will increase the resentment of the poor towards the elites and the governments. In addition, affected citizens may take the crisis as an advantage to challenge the righteousness of the government from managing the economy. Reduced financial budgeting during an economic crisis is further restrained in order to tighten security control, in protecting the corrupt government from public anger and higher crime rates. These factors worsen the recovering abilities of nations and increase the time of an economic crisis.

> **Hypothesis 2a:** Social trust have a negative correlation with duration time of an economic crisis.

> **Hypothesis 2b:** Corruption have a positive correlation with duration time of an economic   crisis.

Corruption upholds a high level of inequality that results in a vicious and endless circle, where social trust is continuously worsen (Uslaner, 2012). On the other hand, a decline in material well-being and unfortunate events, which may be triggered by an economic crisis, lead to a higher possibility of being involved in bribery (Ivles & Hinks, 2015; Hunt, 2007). This indicates that people, who experienced job loss and wage cut, are more likely to pay bribes (Ivles & Hinks, 2015). Furthermore, it is impossible for a normal citizen to measure the trust of all the people in a society, and for this reason, citizens generalize their belief about the trustworthiness of public officials to the whole population (Rothstein, 2013). Therefore, people who experienced corruption with public officials, would assume that other people cannot be trusted. This phenomenon makes it more difficult for a government to implement effective policies or mechanisms against the consequences of an economic crisis, due to the disbelief in the government. As a result, the severity of the crisis will be increased.

In the absence of reliable mechanisms of confidence, people depend on trust to deal with risk in order to make decisions (Tonkiss, 2009). The lack of confidence mechanisms can lead to a financial system crisis, due to failure or distortion of information, contract and regulation. Furthermore, uncertainty presented in the news may reduce customer confidence, due to increasing pessimism and decreasing expectation (Svensson et al., 2016; van Dalen et al., 2017). This suggests that economic crises that derives from high uncertainty may reduce social trust. On the other hand, customer confidence is lost when there is bad faith in the government and economy in general, and this may be the cause of a crisis (Agri et al., 2017). Accordingly, a dishonest government and corrupt political class reduce social trust and, therefore, may have an impact on the consequences of a crisis. However, there is little to no evidence on how social trust, corruption and economic crisis are related to each other. Henceforth, we want to analyze if there are any mediators between these three factors, and so, if social trust could be a mediator between corruption and economic crisis. A *mediator* is a dependent factor that connects the other independent factors together.

> **Hypothesis 3:** Social trust moderates the relationship between corruption and economic crisis, measured as **a)** GDP growth, **b)** unemployment, **c)** government debt or **d)** inflation during crisis time.

We hypothesize that an economic crisis acts as a moderator between social trust and crisis duration. Social trust can reduce the duration of a crisis by weakening the negative impact of such a crisis. Social trust paves the way for countries toward general welfare programs (Rothstein, 2005). Universal welfare programs are far more superior than mean-tested programs in generating social trust because they decrease bureaucratic procedures as well as protect the dignity of all citizens (Rothstein, 2005). There are evidences that the worst affected areas during the financial crisis in 2007 also suffered the most with regard to increasing suicide rates (Barr et al., 2012). Without a doubt, universal welfare programs can protect unemployed citizens by keeping them away from harmful activities. As a result, countries with higher social trust recover faster. High trust among citizens also assures the poor and the rich that they share the same faith

inside the community and that there is no one left behind during the crisis. Consequently, by working together, people can cope with the crisis in a much better way.

Additionally, social trust eases business transactions on the basis of informality and flexibility (Fukuyama, 1995). A high level of trust encourages businesses to expand through interpersonal connection outside of one's immediate social network. Therefore, companies and individuals are less concern about being manipulated by other parties. Instead, they are more willing to cooperate during hard times. Moreover, informal sectors play a key role in the economic recovery of countries. According to Dix-Carneiro and Kovak (2015), the development of legal informal sectors foster economic growth in the worst affected locations of an economic crisis. Furthermore, being employed in the informal sector often prevent the conducting of crimes. In order for legal informal sectors to function properly, there must be a high level of trust inside the community. As a result, social trust not only support formal businesses, but also strengthens informal sectors. Together they reduce the impact of an economic crisis and its duration.

> **Hypothesis 4:** The relationship between social trust and crisis duration is
> moderated by indicators of economic crisis, measured as **a)** GDP growth,
> **b)** unemployment, **c)** government debt or **d)** inflation.

A high level of corruption is negatively correlated with the ability to improve economy (Søreide, 2016). Moreover, corruption reduces a country's capability to protect its national resources. This results in less funds to be used for investments in key economic sectors and infrastructure (Kolstad & Wiig, 2011). Hence, during economic crisis, high corruption causes an increase in dissatisfaction towards the wealthy and the governments, from the poor population. In the time of an economic crisis, an already reduced financial budget is further drained to tighten security control for protecting a corrupt government from public anger and a high crime rate. These factors worsen the recovering abilities of countries and increase the duration of an economic crisis.

Honest and incorrupt governments will make better decisions to protect its citizens from the harmful effects of an economic crisis (Rothstein, 2013). During a crisis, members of disadvantaged groups are exposed to greater social risks (OECD, 2014; Chzhen, 2016). An effective and capable government with enough resources will be able to reduce the social risk by implementing welfare programs and policies. On the other hand, a corrupt government or a highly corrupt country will have less resources to lessen the impact of a crisis to those groups (Kolstad & Wiig, 2011). Moreover, trust and perceptions about honesty are correlated with inequality (Uslaner, 2010). This leads to a decrease in trust in the time of economic crisis. Furthermore, it is impossible for people to measure the individual level of trust in a society, and therefore, citizens generalize their belief about the trustworthiness to the whole population (Rothstein, 2013). People who have a negative experience of corruption or bribery involving the public officials, would assume that other people cannot be trusted. For that reason, it would be more difficult for governments to implement effective policies or mechanisms against the impact of an economic crisis. The increase of crisis duration happens because policies take more time to be fully enforced when social trust is low.

After an economic shock, the "long run"-recovery of employment rates is fully induced by a development of the legal informal sector, suggesting that informal employment keep individuals from doing crime (Dix-Carneiro and Kovak, 2015). In highly corrupt countries there are already an informal sector in place, with illegal activities such as tax-evasion or people whom are forced to work without payment. In corrupt countries, economic crises weaken the government's capability and its financial resources. This makes the development of a legal informal sector more difficult, and hence, has a negative impact on the "long run"-recovery of employment rates. All in all, we believe corruption strengthens the impact of an economic crisis and increases its duration.

> **Hypothesis 5:** The relationship between corruption and crisis duration is moderated by economic crisis, measured as **a)** GDP growth, **b)** unemployment, **c)** government debt or **d)** inflation.

The link between equality and trust can be explained by economic inequality and equality of opportunity (Rothstein, 2005). Individuals feel that societies do not treat them fairly, so they start losing trust in others who have more resources. Another reason for the distrust, is that when the level of inequality is high, people in the same society tend to believe that they do not share the same destiny (Rothstein, 2005). This leads to an increase in negative stereotypes, which further reduces the level of trust towards different social groups (Boix & Posner, 1998). Furthermore, a corrupt government produce higher inequality and lower social trust, explaining by the establishment of universal welfare programs (Rothstein, 2005). Universal welfare programs reward all the people in a society equally, but such programs are rarely established in a country that has a high level of corruption. The reason for this is either low public support or unsuccessfully implementation, since the poor will not share any benefits with the rich in a society with high corruption and low trust. A more common practice in those countries is the implementation of means-tested programs, which reward specific groups in a society by some selection methods (Tella & MacCulloch, 2009). These programs often create a sense of resentment from the poor by treating them differently compare to other groups, humiliate unfortunate individuals and further reduce their trust in high-income groups (Soss, 2001). These effects create a never-ending social trap of inequality, low trust and high corruption (Uslaner, 2012).

On an individual level, the impact of perceived economic crisis is associated with more favorable attitudes towards welfare policies (Jeene et al., 2014; Fraile & Fons, 2005). However, the welfare state support is less related to perceived crisis impact when social spending is higher. This indicates that encompassing welfare states reduce the subjective impacts of an economic crisis (Blekesaune, 2013). Moreover, social consequences of economic downturns are distributed unevenly among individuals, due to social class risks (Eurofund, 2012; Rueda, 2012; Sachweh, 2017). In general, members of disadvantaged groups are expected to be exposed to greater social risks during economic downturns than members of privileged groups (OECD, 2014; Chzhen, 2016). Disadvantaged groups have fewer economic resources as a buffer for material consequences of economic downturns. Therefore, they are more dependent on state benefits in order to maintain their standard of living than members of privileged groups (Kluegel, 1988).

This suggests that in societies with high level of inequality, the governments need to use more resources, due to larger differences between social classes and larger number of disadvantaged groups. Moreover, the increase in social spending in European countries is smallest in the countries that were most affected by an economic crisis. This indicates that there are differences in countries' capacities to handle the effects of economic downturns (Leschke & Jespen, 2012). An explanation is that European welfare states still differ in their institutional design and generosity, as well as in their policy responses to an economic crisis (Scruggs & Allan, 2006; Starke et al., 2013; Van Hooren et al., 2014). Furthermore, local negative economic crises may decrease government revenues and affect the supplying of public goods (Dix-Carneiro et al., 2017). We believe that societies with a high level of inequality need to increase public debt, because of a decrease in government revenues during periods of economic crisis and less financial resources. The increase level of public debt leads to an increase in inflation rate and in a reduction in GDP growth, see Appendix for a macroeconomic explanation.

> **Hypothesis 6:** Equality has an effect on economic crisis by correlating positively with **a)** GDP growth and negatively with **b)** unemployment, **c)** government debt or **d)** inflation.
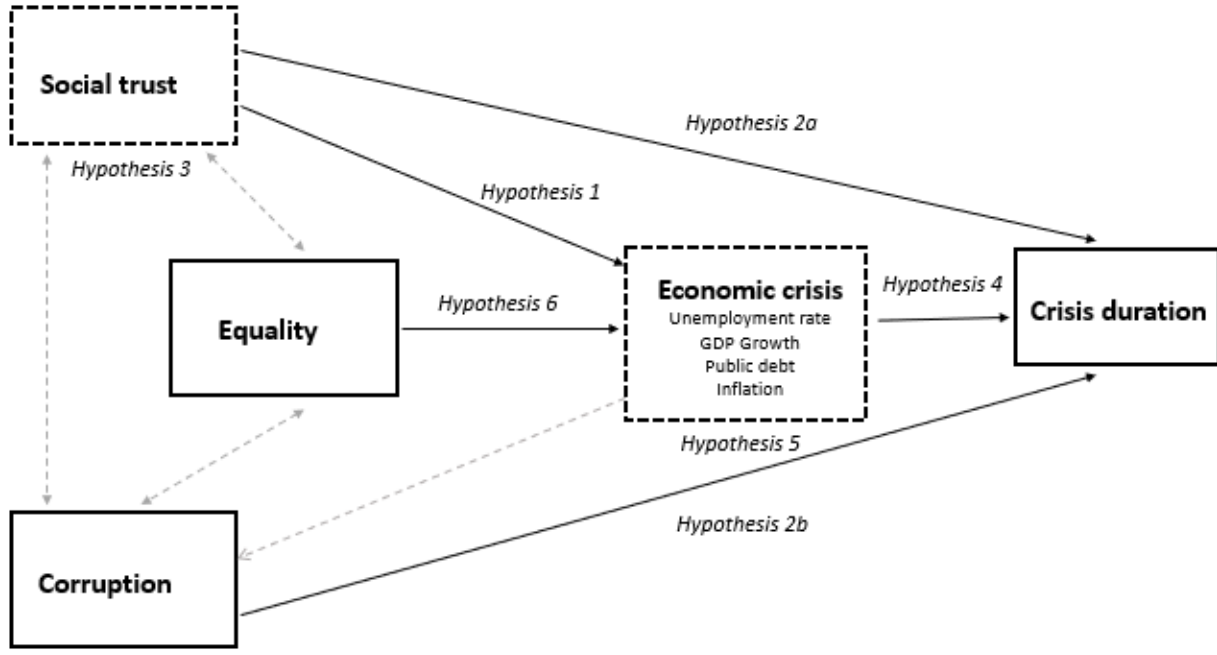
Figure 2: Hypotheses and conceptual framework. *Source:* Own depiction, *solid arrows* indicate hypothesized relationships, *dashed arrows* indicate non-hypothesized relationships, *dashed box* indicate mediators, *undirected solid line* indicates unknown hypothesized relationships.

2 Methodology

In this section we present the methods used to answer our research question. Firstly, we present the original databases, and then the adjustments made to the databases for the purpose of this paper. Secondly, we introduce an empirical model for the econometric analysis before we discuss the weaknesses about the databases.

2.1 Presentation of databases

The dataset of social trust and corruption was collected from The Quality Of Government Institute (The QoG Institute). Founded in 2004 by Professor Bo Rothstein and Professor Sören Holmberg. One of the most important part of establishing the QoG Institute is to organize a database collection in order to promote research on the nature of Good Governance and the Quality of Government. The QoG Institute is also an independent research institute within the Department of Political Science at the University of Gothenburg, Sweden. The Quality of Government Institute (2019) database is freely available from The QoG Institute's website. The database is comprised of five datasets, which are QoG Standard Dataset, QoG Basic Dataset, QoG Expert Survey, QoG OECD and EU Regional Data. We only work with QoG Standard Database in the current research. QoG Standard Database is the largest dataset out of the five and includes almost 2100 variables from more than 100 data sources.

Furthermore, we used the database "The Global Crises Data by Country" collected by Dr.Carmen Reinhart (2019), along with her co-authors Ken Rogoff, Cristoph Tresbesch and Vincent Reinhart. The database includes the dates of banking crisis, systemic crisis and inflation crisis from 1800 to 2016 in more than 70 countries. The Behavioral and Financial Stability Project (BFFS Project) was founded at Harvard Business School and the Global Crises Data by Country is a part of the BFFS project's database. The project maintains an ongoing real-time database of financial stability indicators and is available to researchers, as well as to the public.

2.2 Analysis techniques

The current paper will be based on two analytical methods – descriptive analysis and econometric analysis. First, we perform descriptive analysis on the dataset of social trust, corruption and economic crisis in different countries and regions and regions. The intention of the descriptive analysis is to acquire insight into whether there are significant differences in social trust and corruption, as well as to understand the impact of economic crises. Besides descriptive analysis, we also apply econometric techniques to analyze our data. The purpose of econometric analysis is to study the connection between dependent variable and independent variable. For each of the hypotheses we introduce a multiple regression with control variables. Furthermore, we also use the regression method based on the approach of Baron & Kenny (1986) to uncover any hypothesized mediators, see Appendix for mechanisms behind the regression method. Control variables are selected carefully based on the theory part to exclude factors that can significantly affect the interpretation of the empirical results. For technical calculation and visualization of the data, we utilize the software package STATA 14.0. Additionally, informations about the operating methods and the software package were taking from the book written by Wooldridge (2016).

2.3 Structuring of data

Initially, we structure the dataset so that it become suitable with the purpose of this research. In the table below, we compare the assortment of the original datasets with our dataset. After scaling, we kept all the countries and reduced the number of variables from 2202 to 9. Consequently, the number of observations is also reduced. The number of observations in our dataset is reduced to ~74% and includes 11364 observations distributed across 211 countries. However, the dataset is collected from different public sources, and consequently, some of the variables may lack observations. Furthermore, we exclude extreme variables in the econometric analysis. Therefore, the regressions may differ in the number of observations than what is stated here.

	Number of countries and territories	Number of observations	Number of variables
Original datasets	211	15403	2202
Our dataset	211	11364	9
Percentage	100 %	73,78 %	0,41 %

Table 1: Downscaling of the dataset

Furthermore, we created a dummy variable for the economic crises when at least one crisis is occurring in a specific year in a country (1 = at least one crisis in this year and country, 0 = no crisis in this year and country). The reason we created this dummy variable is to observe the effects on the regression models when there was at least one ongoing crisis. Consequently, the number of observations in the econometric analysis is reduced to 5112 observations (44,98 %).

Dependent variables

In the empirical specifications for the regression analysis, an economic crisis is either the independent or the dependent variable. An economic crisis is defined as an unexpected deterioration in four key macroeconomic indicators, which is GDP growth, unemployment, inflation and public debt. Therefore, an economic crisis can be split into these four variables. In the QoG Database, GDP growth is reported as an annual percentage in the QoG database. Public debt, as net lendings and borrowings during a year by the government, is reported as a percent of GDP. Unemployment rate is stated as a percent of total labor force and inflation rate (annual %) is average consumer price. According to George & Mallery (2011) a skewness value between ± 1,0 is considered excellent for most purposes, but a value between ± 2,0 is also acceptable depending on the application. During economic crisis, the skewness of GDP growth is -1,20, public debt is 1,95, unemployment is 1,33 and inflation is 10,91. The skewness of GDP growth, public debt and unemployment are within ± 2. The high level of positive skewness in inflation is as expected, because economic crises often occur with a high level of inflation. Fortunately, inflation has a high number of observations (584 observations). An anova (analysis of variance), including both fixed-effects models and random-effects models, is not very sensitive to moderate

deviations from normality. Studies using non-normal distributions have shown that the false positive rate is almost unaffected by this violation of the assumption. The central limit theorem says that when there is a large number of random samples from a population, the means of those samples are approximately normally distributed even when the population is not normal (Glass, Peckham, & Sanders, 1972; Harwell, Rubinstein, Hayes, & Olds, 1992; Lix, Keselman, & Keselman, 1996). Therefore, we will not change the data of inflation for the econometric analysis.

Crisis duration is defined as the beginning and the end of a crisis. A crisis ends in the year before both real GDP growth and real credit growth are positive for two consecutive years. In the database collected by Carmen Reinhart, each of the crisis - banking, systemic and inflation - has a dummy variable for when a crisis is occurring in a specific year and country (1 = crisis, 0 = no crisis). To measure the crisis duration, we add a dummy variable for when at least one of the crises is occurring in a specific year in a country (1 = at least one crisis in this year and country, 0 = no crisis in this year and country). Then we count the number of consecutive crisis years to measure the duration of economic crises in each country. Therefore, the crisis duration is measured in number of years between the start and end of the crisis. The skewness of crisis duration is 0,84 and falls in the excellent range (within ± 1,0) as acceptable variable for further analyses (George & Mallery, 2011). For this reason, there is no need to change the data to increase the normality for the econometric analysis.

Independent variables

Social trust is defined as the faith of people in a society to one another. In the QoG standard database, social trust is reported as an index score. The index score represents an average of all country-survey scores available within each country-year observation. These scores have a range from 0 (lowest level of trust) to 100 (highest level of trust). The skewness is within ± 1,0 (0,36 during economic crises), so there is no reason to change the data to increase the normality.

Corruption is defined as the abuse of public power for private gain. We use the Bayesian Corruption Index (BCI), from the QoG standard database, to represent the corruption level. The index is a composite index of the perceived overall level of corruption. The BCI is associated with the perceptions of the degree of corruption and ranges between 0 (everyone agrees there is no corruption at all) and 100 (corruption is as bad as it can get). We do not conduct any changes to corruption for the regression analysis, since the skewness is acceptable (-0,78 during economic crises).

Equality affects how countries differ in their institutional design, generosity, welfare programs, social spending and policy responses to the crisis. Hence, equality affects countries' capacities to handle the impact of economic downturns. We use "Gini Index" from QoG Databases. The Gini index measures the degree of inequality in the distribution of family income in a country. This indicates that low Gini Index means high equality, and vice versa. Moreover, the skewness of the GINI Index is 0,31 during economic crises, and therefore, no adjustments are needed. Equality as an independent variable is used only in Hypothesis 6, see equality under control variables.

Control variables

The purpose of introducing control variables to the regressions is to isolate the effects of other factors, which may influence the connections between independent variables and dependent variables. Accordingly, our results can reflect the relationship between these two types of variables as accurately as possible. In the section below, we present the control variables and the reasons why they are selected.

Population capabilities can affect how well populations of a country handle challenges as well as how they process news from economic crises, so it may affect crisis duration and crisis impact. To measure population capabilities, we utilize "Human Development Index" from QoG databases. The Human Development Index (HDI) is meant to summarize the measure of average achievement in three essential dimensions of human development: a long and healthy life, being

knowledgeable and have a decent standard of living. The HDI was established to emphasize that human capabilities should be the ultimate criteria for assessing the development of a country, not just the economic development. We do not conduct any changes to HDI for the regression analysis, since the skewness is acceptable (-0,37 during economic crisis).

Equality level can affect the level of social trust and corruption. Higher inequality levels create distrust among different social classes and worsen the level of social trust. To measure equality, we use "Gini Index" from QoG Databases. Gini index measures the degree of inequality in the distribution of family income in a country. The more equal a country's income distribution, the lower is Gini index. On the other hand, the more unequal a country's income distribution, the higher is Gini index. If income were distributed with perfect inequality, the index would be 100. If income were distributed perfectly equally the index would be zero. Equality is used as a control variable in Hypothesis 1 to 5.

2.4 Empirical specifications

Interpretation of empirical econometric analysis must be based on relevant theories to adequately provide good results. For this reason, based on the theoretical foundation and clarification of the variables, we decide to construct regression models for each hypothesis. In this research, we use panel data model in the analysis, because our dataset provides a time series for each country unit.

For Hypothesis 1, 2 and 6, the original form of regression models is presented. The dataset is structured, so it is appropriate for the current research paper and its hypotheses. Therefore, in the regression analysis we limit the time period to only contain periods when at least one economic crisis is presents. Consequently, the empirical models below should only be used when there is an economic crisis present. We use the crisis dummy we created earlier to limit the time period, see structuring of data.

Hypothesis 1:

- *GDP growth rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Unemployment rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Inflation rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Public debt rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Hypothesis 2:

2a: Crisis duration$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$

2b: Crisis duration$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$

For Hypothesis 3, 4 and 5, we apply Baron and Kenny (1986) method to test for mediation effects. Mediation effects are a bit more complicated than direct effects, and therefore, requires more steps to complete.

Hypothesis 3:

Step 1:

- *GDP growth rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Unemployment rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Inflation rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Public debt rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Step 2:

- *Social Trust$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ V$_t$ + a$_i$ + u$_{i,t}$*

Step 3 - Similar to regressions in hypothesis 1:

- *GDP growth rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Unemployment rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Inflation rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Public debt rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Step 4:

- *GDP growth rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × Social Trust$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + β$_4$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Unemployment rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × Social Trust$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + β$_4$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- *Inflation rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × Social Trust$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + β$_4$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Public debt rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × Social Trust$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + β$_4$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Hypothesis 4:

Step 1: Similar to Hypothesis 2a

- *Crisis Duration$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × Gini$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Step 2 - Similar to regressions in hypothesis 1:

- *GDP growth rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Unemployment rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Inflation rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Public debt rate$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Step 3:

- *Crisis Duration$_{i,t}$ = α + β$_1$ × GDP growth rate$_{i,t}$ + β$_2$ × Gini$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Crisis Duration$_{i,t}$ = α + β$_1$ × Unemployment rate$_{i,t}$ + β$_2$ × Gini$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Crisis Duration$_{i,t}$ = α + β$_1$ × Inflation rate$_{i,t}$ + β$_2$ × Gini$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Crisis Duration$_{i,t}$ = α + β$_1$ × Public debt rate$_{i,t}$ + β$_2$ × Gini$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Step 4:

- *Crisis Duration$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × GDP growth rate$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + β$_4$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Crisis Duration$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × Unemployment rate$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + β$_4$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Crisis Duration$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × Inflation rate$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + β$_4$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Crisis Duration$_{i,t}$ = α + β$_1$ × Social Trust$_{i,t}$ + β$_2$ × Public debt rate$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + β$_4$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Hypothesis 5:

Step 1: Similar to Hypothesis 2b

- *Crisis Duration$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × Gini$_{i,t}$ + β$_3$ × HDI$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

Step 2 - Similar to regressions in step 1 of Hypothesis 3:

- *GDP growth rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Unemployment rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*
- *Inflation rate$_{i,t}$ = α + β$_1$ × BCI$_{i,t}$ + β$_2$ × HDI$_{i,t}$ + β$_3$ × Gini$_{i,t}$ + V$_t$ + a$_i$ + u$_{i,t}$*

- $Public\ debt\ rate_{i,t} = \alpha + \beta_1 \times BCI_{i,t} + \beta_2 \times HDI_{i,t} + \beta_3 \times Gini_{i,t} + V_t + a_i + u_{i,t}$

Step 3 - Similar to regressions in step 3 of Hypothesis 4:

- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times GDP\ growth\ rate_{i,t} + \beta_2 \times Gini_{i,t} + \beta_3 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times Unemployment\ rate_{i,t} + \beta_2 \times Gini_{i,t} + \beta_3 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times Inflation\ rate_{i,t} + \beta_2 \times Gini_{i,t} + \beta_3 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times Public\ debt\ rate_{i,t} + \beta_2 \times Gini_{i,t} + \beta_3 \times HDI_{i,t} + V_t + a_i + u_{i,t}$

Step 4:

- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times BCI_{i,t} + \beta_2 \times GDP\ growth\ rate_{i,t} + \beta_3 \times Gini_{i,t} + \beta_4 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times BCI_{i,t} + \beta_2 \times Unemployment\ rate_{i,t} + \beta_3 \times Gini_{i,t} + \beta_4 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times BCI_{i,t} + \beta_2 \times Inflation\ rate_{i,t} + \beta_3 \times Gini_{i,t} + \beta_4 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Crisis\ Duration_{i,t} = \alpha + \beta_1 \times BCI_{i,t} + \beta_2 \times Public\ debt\ rate_{i,t} + \beta_3 \times Gini_{i,t} + \beta_4 \times HDI_{i,t} + V_t + a_i + u_{i,t}$

Hypothesis 6:

- $GDP\ growth\ rate_{i,t} = \alpha + \beta_1 \times Gini_{i,t} + \beta_2 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Unemployment\ rate_{i,t} = \alpha + \beta_1 \times Gini_{i,t} + \beta_2 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Inflation\ rate_{i,t} = \alpha + \beta_1 \times Gini_{i,t} + \beta_2 \times HDI_{i,t} + V_t + a_i + u_{i,t}$
- $Public\ debt\ rate_{i,t} = \alpha + \beta_1 \times Gini_{i,t} + \beta_2 \times HDI_{i,t} + V_t + a_i + u_{i,t}$

In these regression models, α represents the intercepts of regressions, β represents the coefficient values of each variables, V_t is time variance factors that does not vary between countries, a_i is individual specific factors of countries that does not vary over time and $u_{i,t}$ is idiosyncratic error term. The lower-case letter "i" represents country unit, the lower-case letter "t" represents time unit (year).

2.5 Weaknesses in the data

The quality of the data depends on its reliability and validity. Reliability means to what extent one can trust that the results are trustworthy, while validity is about the robustness of what one aims to measure (Saunders, Lewis & Thornhill, 2016). In this section, we present the possible data's shortcomings and how we overcome these obstacles, as well as the data's advantage. First

of all, we are using a selection of secondary databases. These databases are collected for different purposes. Therefore, we are at risk losing important information, such as missing explanatory variables that could have an impact on the intention of our research (Saunders et al., 2016). For this reason, it must be acknowledged that the validity may decreases. Another weakness about using different databases is that the databases are in various formats and the range of years is different. To tackle these problems, we maintain a clear approach on our methodology to guarantee high transparency (Saunders et al., 2016).

Additionally, there are possibilities that the answers for the social trust and corruption databases are subjective. However, the problems were limited by the data's authors. The selection of social trust data is based on HUMAN Surveys (Human Understanding Measured Across National), which combines multiple sources of public opinion data and creates commonly formatted variables. Each observation is an aggregated score representing all the respondents within a country per survey round. Furthermore, the data on corruption is an aggregated score from 20 surveys and 80 questions that cover the perceived level of corruption from inhabitants, companies and officials. Consequently, the subjective aspect is considered affordable.

We use "year" as a unit to measure the duration of economic crises. This could be inaccurate, since it could date a crisis too early or too late. Consequently, the duration is either too short or too long. For example, Crisis A starts in December year t_0 and ends in February year t_1, while Crisis B starts in January year t_0 and ends November year t_0. Crisis B is longer than Crisis A. In our analysis, however, the duration for Crisis A is two years, while Crisis B is one year. Generally, it is very difficult to date some of these crises, and in many cases impossible to confirm the date of the final resolution (Reinhart & Rogoff, 2009). Nevertheless, the problem may decrease the reliability of our results, we still find them acceptable. In this paper, we are trying to establish the possible correlations between social trust and corruption with economic crisis. Calculating exactly how social trust and corruption affect economic crisis is not our final goal, we believe that "year" is a reasonable unit to measure crisis duration.

3 Descriptive analysis

In the following section, we present our descriptive analysis. We introduce graphs and tables to depict our variables from previous sections. The purpose of the graphs and tables is to describe our dataset. Moreover, we utilize these materials to illustrate possible correlations among the variables. However, we cannot draw any conclusions nor prove any hypotheses based on the descriptive analysis.

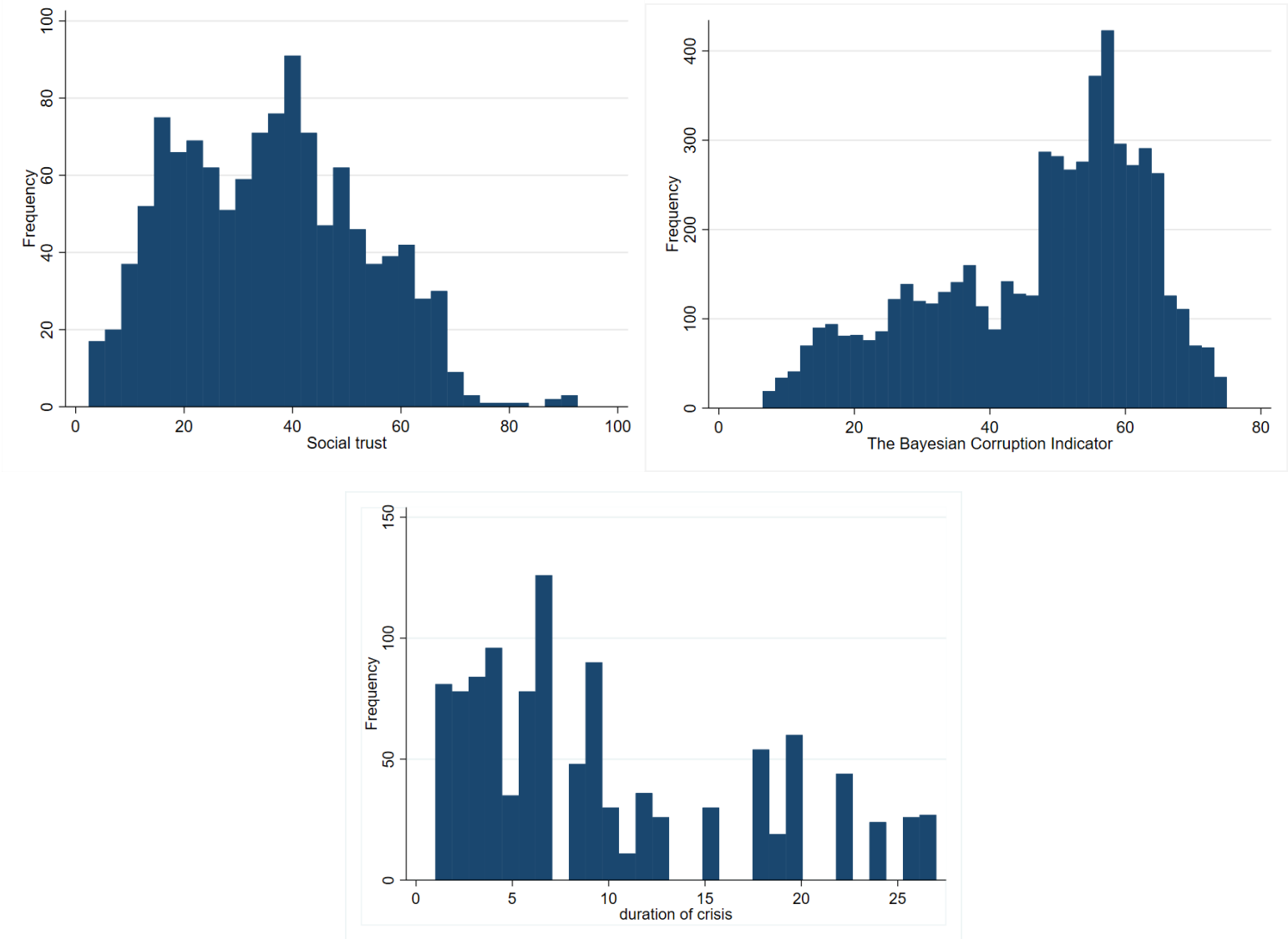## 3.1 Social trust, corruption and crisis duration

Figure 3: Histogram of corruption and social trust is from the whole population. Crisis duration is only when there is a crisis. Upper left is social trust, in the upper right is corruption and the lower one is duration of crisis.

Figure 3 shows the distributions for social trust and corruption in the entire sample, while crisis duration is only observed when there is a crisis present. The inconsistent between the median and the mean from Table 2 indicates that social trust has a positive skewness of 0,27 (0,36 during economic crises), corruption has a negative skewness of -0,64 (-0,78 during economic crises) and crisis duration has a positive skewness of 0,85. Henceforth, the distributions of social trust and crisis duration have a right-handed tail, while corruption has a left-handed tail. The kurtosis of the three values is less than three. This implies that the distributions are shorter, and the tails are thinner due to less extreme values than that of a normal distribution.

Statistic		Social trust	Corruption	Crisis duration
Obs		1168	5639	1103
Mean		35,69	47,17	9,71
Median		35,75	51,14	7
Std. Dev		17,03	15,80	7,39
Skewness		0,27	-0,64	0,85
Kurtosis		2,45	2,45	2,55
Percentiles:				
	1	4,68	10,35	1
	50	35,75	51,14	7
	99	71,12	72,62	27

Table 2: Descriptive statistic for corruption and social trust from the entire sample. Descriptive statistic about crisis duration is from when there is a crisis present.

The variation of social trust, corruption and crisis duration in 10 different regions are shown in Figure 4. The region numbers and their corresponding names are mentioned in Table 3. Surprisingly, region 10 (The Caribbean) has the highest social trust (~56%), following by region 5 (Western Europe & Northern America) with ~48% and region 6 (East Asia) with ~47%. These regions differ from the other regions, where social trust rate falls between 25-35%. In the theory section, we discussed that social trust was created by equality and incorrupt governments. In Western Europe & Northern America, where education is high and corruption is low (~23%), the theory matches the graph. In The Caribbean and East Asia, corruption is relatively high, and

therefore, social trust may come from high equality. Furthermore, the duration of a crisis is lowest in region 3 (North Africa & The Middle East) with a crisis duration ~6 years, and highest in region 7 (South-East Asia) with ~16 years. From the graph, we cannot observe any strong correlations between crisis duration and social trust or corruption within the specific regions.
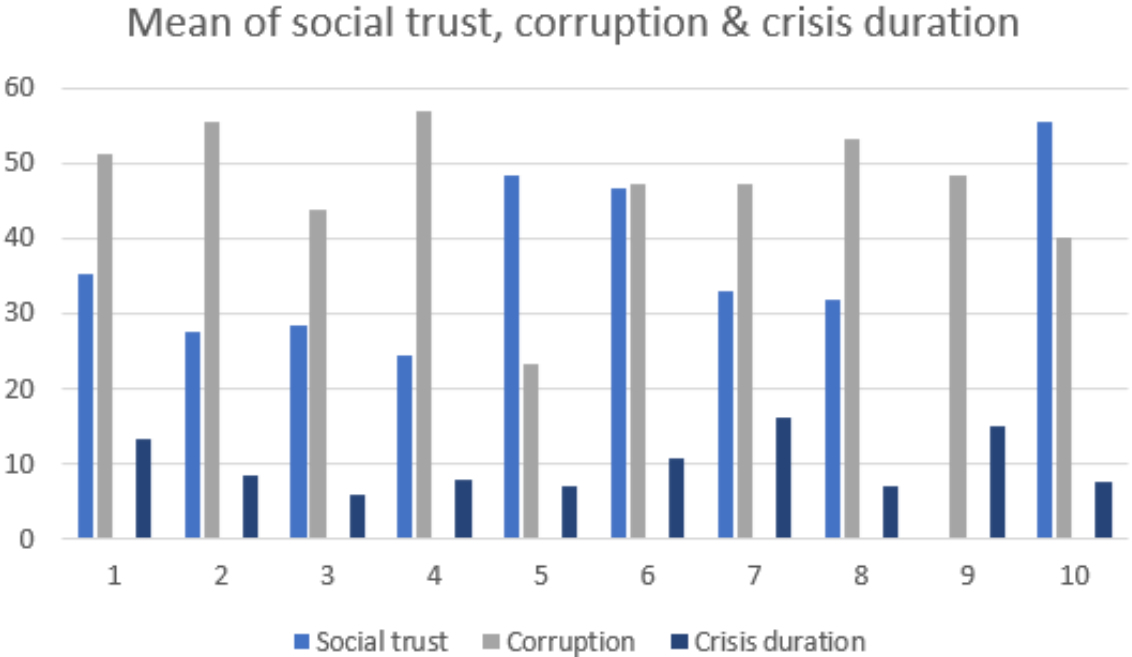
Figure 4: Mean of social trust and corruption from the entire sample. Crisis duration is from when there is a crisis presents.

Table 3 shows that there are substantial differences between observations recorded in each region. The difference between the highest and lowest number of observations is as follows: Latin America and The Pacific is 351 observations for social trust, Sub-Saharan Africa and East Asia is 1226 observations for corruption, and between Sub-Saharan Africa and South Asia is 125 observations for crisis duration. In isolation, this implies that we have a better basis for obtaining reliable results from the regions with higher observations. Hence, our analysis is based on the entire sample. The table also illustrates the minimum and maximum values recorded for social trust, corruption and crisis duration. All regions show low minimum value and high maximum value for all three variables, indicating highly scattered values of these variables within a region.

Region	Name	Variable	Obs	Mean	Std. Dev	Min	Max
1	Eastern Europe & Post-Soviet Union	Social trust	214	35,30	11,88	7,12	67,63
2	Latin America	Social trust	351	27,59	15,11	2,42	71,12
3	North Africa & the Middle East	Social trust	71	28,45	14,06	4,78	65,35
4	Sub-Saharan Africa	Social trust	99	24,55	14,84	3,50	65,20
5	Western Europe & North America	Social trust	300	48,36	12,59	10,05	79,95
6	East Asia	Social trust	44	46,79	14,61	13,65	89,37
7	South-East Asia	Social trust	46	32,88	23,72	2,84	92,59
8	South Asia	Social trust	20	31,84	11,33	11,18	51,42
9	The Pacific	Social trust	0				
10	The Caribbean	Social trust	23	55,59	17,09	3,22	68,65
1	Eastern Europe & Post-Soviet Union	Corruption	704	51,18	9,28	14,76	69,52
2	Latin America	Corruption	679	55,57	10,72	25,12	74,12
3	North Africa & the Middle East	Corruption	671	43,90	13,39	13,84	72,38
4	Sub-Saharan Africa	Corruption	1427	56,88	9,85	22,87	74,96
5	Western Europe & North America	Corruption	823	23,39	10,75	6,45	55,22
6	East Asia	Corruption	201	47,33	15,31	16,96	74,21
7	South-East Asia	Corruption	331	47,23	15,66	9,86	66,64
8	South Asia	Corruption	224	53,21	8,63	30,67	66,02
9	The Pacific	Corruption	241	48,53	7,59	36,06	63,32
10	The Caribbean	Corruption	337	40,23	14,01	21,46	60,96
1	Eastern Europe & Post-Soviet Union	Duration	135	13,21	9,24	1	27
2	Latin America	Duration	99	8,39	6,40	1	20
3	North Africa & the Middle East	Duration	95	5,99	3,30	1	12
4	Sub-Saharan Africa	Duration	154	7,99	5,30	1	18
5	Western Europe & North America	Duration	116	7,02	4,34	1	15
6	East Asia	Duration	43	10,72	6,50	1	18
7	South-East Asia	Duration	85	16,25	6,65	1	24
8	South Asia	Duration	29	6,93	2,69	1	9
9	The Pacific	Duration	64	15,13	10,34	1	26
10	The Caribbean	Duration	59	7,71	3,39	1	13

Table 3: Social trust, corruption and crisis duration in the particular regions.

3.2 Social trust and economic crisis

To illustrate possible correlations between social trust and the four economic crisis indicators (GDP growth rate, unemployment rate, public debt and inflation rate) in both crisis and non-crisis periods, we introduce Figure 5. Government debt over 300% and inflation over 1000% are left out of the figure to clearly illustrate the distribution of the points. However, no values are omitted from the data set. There are substantial differences between non-crisis and crisis periods

for GDP growth and public debt. During periods of crisis, GDP growth and social trust have a strong negative correlation, while the correlation is limited during non-crisis periods. Furthermore, public debt and social trust have a strong positive correlation during periods of economic crises, while there is a strong negative correlation between them during non-crisis periods. Unemployment and inflation have strong negative correlations with social trust in both periods.
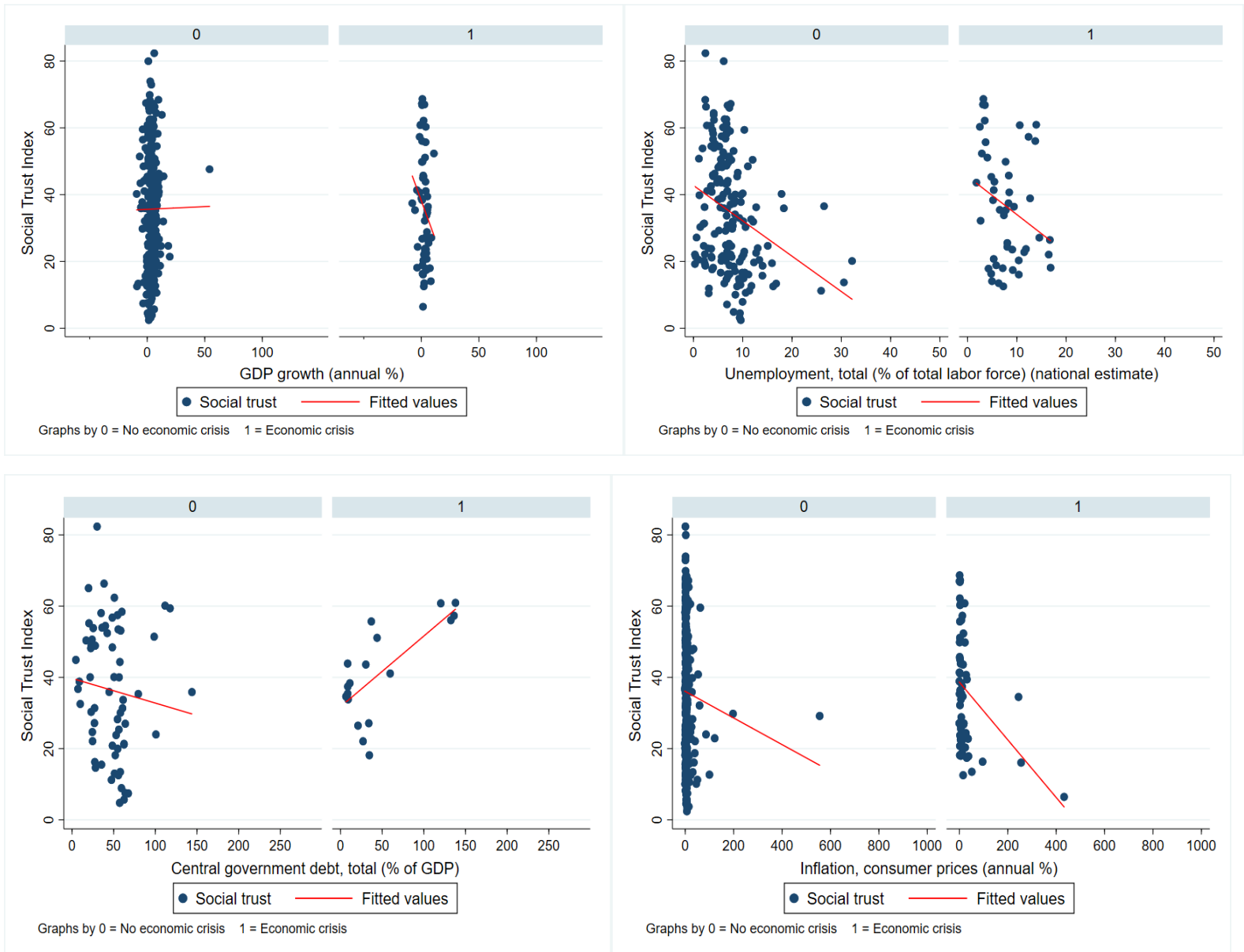
Figure 5: Upper left is social trust and GDP growth, upper right is social trust and unemployment, lower left is social trust and debt, lower right is social trust and inflation. 0 is no crisis and 1 is crisis period.

3.2 Corruption and economic crisis

Figure 6 is introduced to help us illustrate possible correlations between corruption and the four economic crisis indicators (GDP growth rate, unemployment rate, public debt and inflation rate) in both crisis and non-crisis time. Government debt over 300% and inflation over 1000% are left out of the figure to clearly illustrate the distribution of the points. However, no values are omitted from the data set. From this figure, we notice that the situation is very similar in both crisis and non-crisis periods. Bayesian Corruption Index seems to have positive correlations with the four crisis indicators regardless of periods.
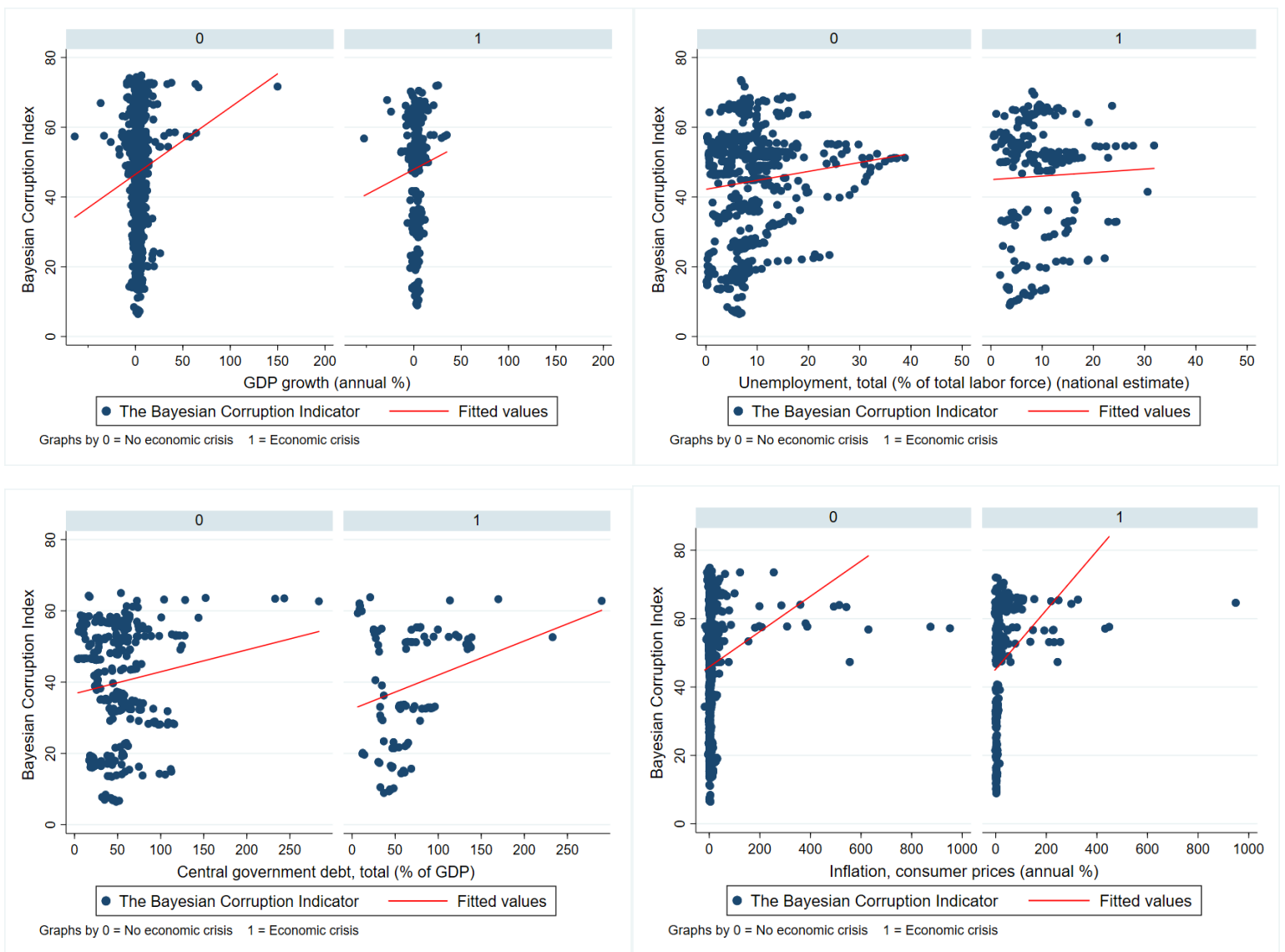

Figure 6: Upper left is corruption and GDP growth, upper right is corruption and unemployment, lower left is corruption and debt, lower right is corruption and inflation. 0 is no crisis and 1 is crisis period.

3.3 Crisis duration, social trust and corruption

Figure 7 helps us to exhibit possible correlations between crisis duration and social trust, as well as corruption and crisis duration. We observe that there is a limited correlation between social trust and the duration of economic crises. Similarly, Bayesian corruption index seems to have a limited correlation with the duration of economic crises.
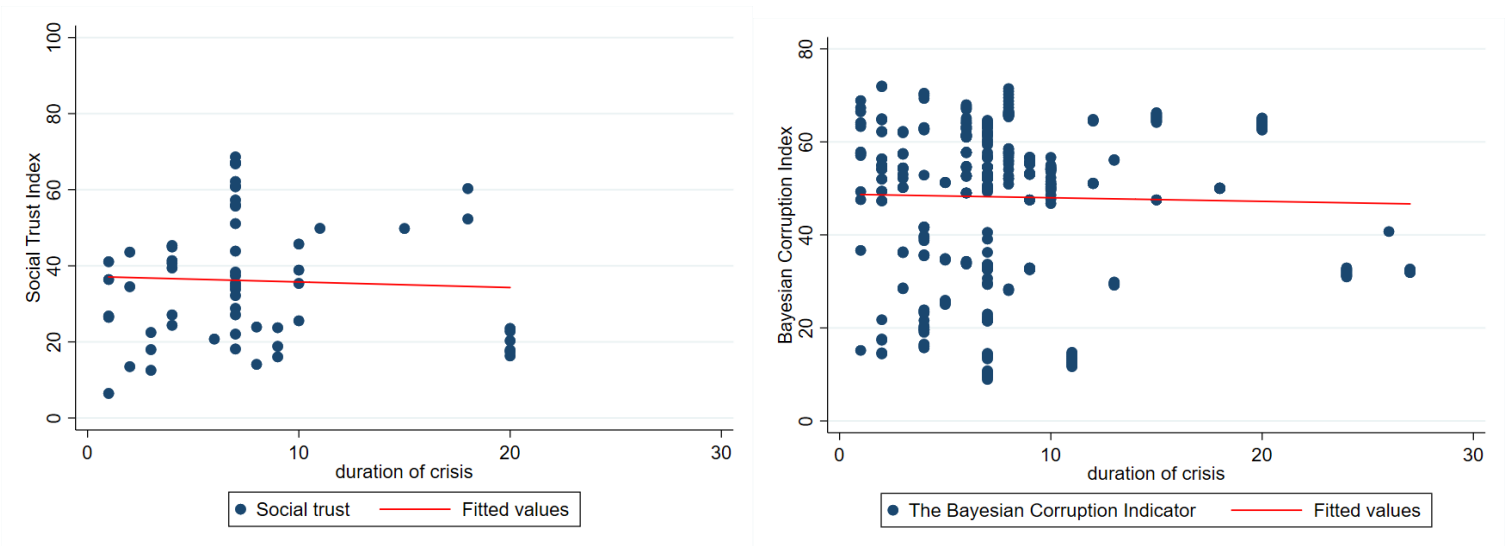
Figure 7: Left is social trust and crisis duration. Right is corruption and crisis duration.

3.4 Population capabilities and economic crisis

In order to gain good insights of population capabilities (Human Development Index, HDI) in relation to the indicators of economic crisis, and how they differ in periods with and without economic crises, we presented Figure 8. Government debt over 300% and inflation over 1000% are left out of the figure to clearly illustrate the distribution of the points. However, no values are omitted from the data set. There are not great differences in the two situations. The population capabilities have a negative effect on GDP growth, government debt and inflation, but a limited correlation with unemployment rate. This implies that higher population capabilities - a long healthy life, being knowledgeable and a decent standard of living - correlate with less GDP growth, government debt and inflation. If we consider that a high level of HDI is typical of developed countries, while high GDP growth, government debt and inflation is typical of emerging countries, the graph matches the theory.
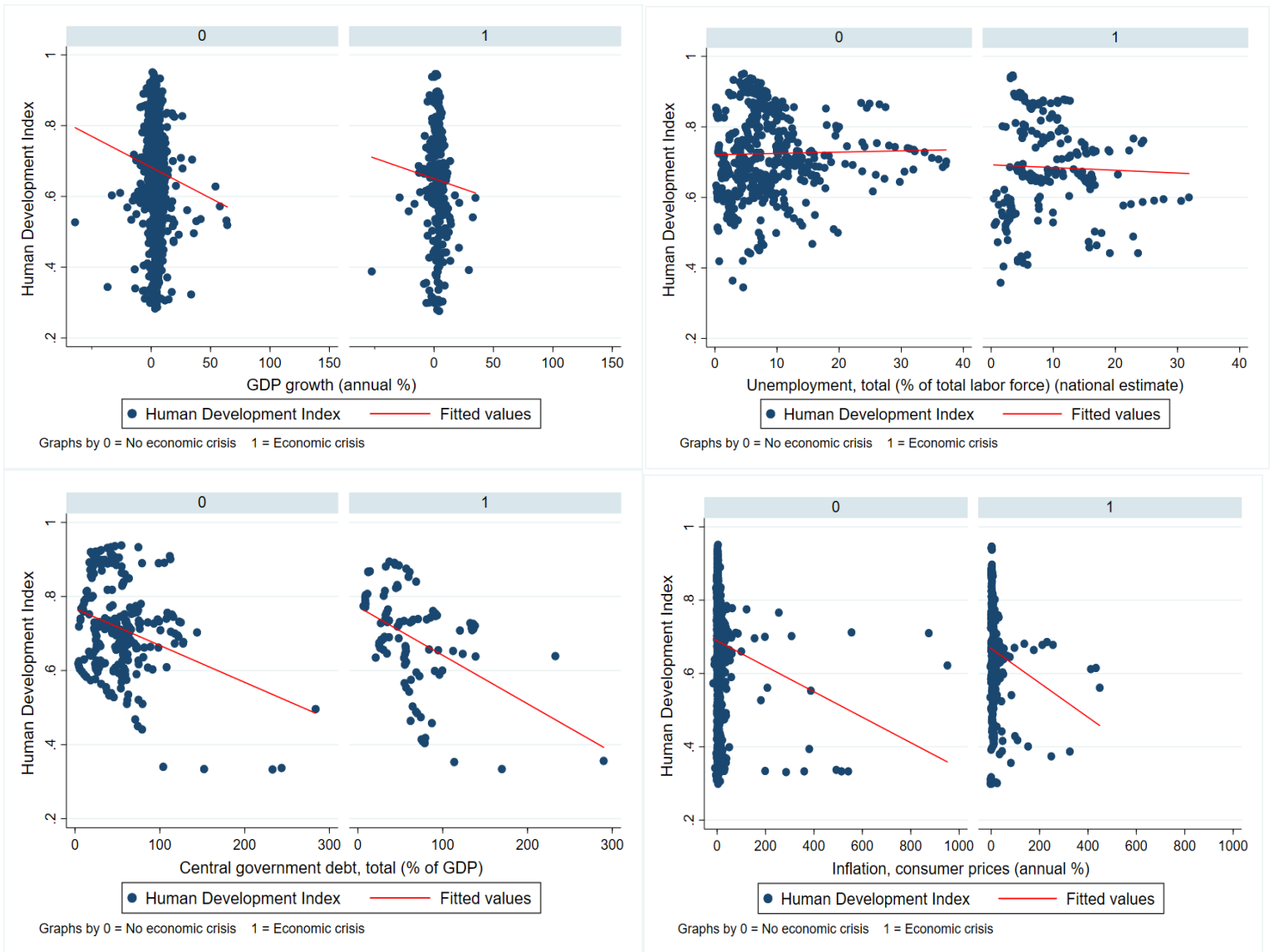
Figure 8: Upper left is population capabilities and GDP growth, upper right is population capabilities and unemployment, lower left is population capabilities and debt, lower right is population capabilities and inflation. 0 is no crisis and 1 is crisis period.

3.5 Equality and economic crisis

Figure 9 aims to show how equality in periods with and without economic crises are related to the indicators of economic crisis. Government debt over 300% and inflation over 1000% are left out of the figure to clearly illustrate the distribution of the points. However, no values are omitted from the data set. We used Gini Index as an indication of equality (low Gini index gives high equality and vice versa). From the figure, there are great differences in the two situations. During periods of economic crises, Gini Index has a negative effect on GDP growth and government debt, and a positive effect on unemployment and inflation. This implies that higher equality is correlated with higher GDP growth, higher government debt, lower unemployment and lower inflation during an economic crisis. This is consistent with the theory, since societies with a high level of equality usually increase debt, implement welfare programs and generate more jobs in order to smooth out the impact of a crisis. Henceforth, they will be able to reduce unemployment and increase GDP growth. On the other hand, during periods of no economic crises, there is limited correlations between equality and GDP growth, unemployment and public debt. However, inflation is positive correlated with the Gini Index.
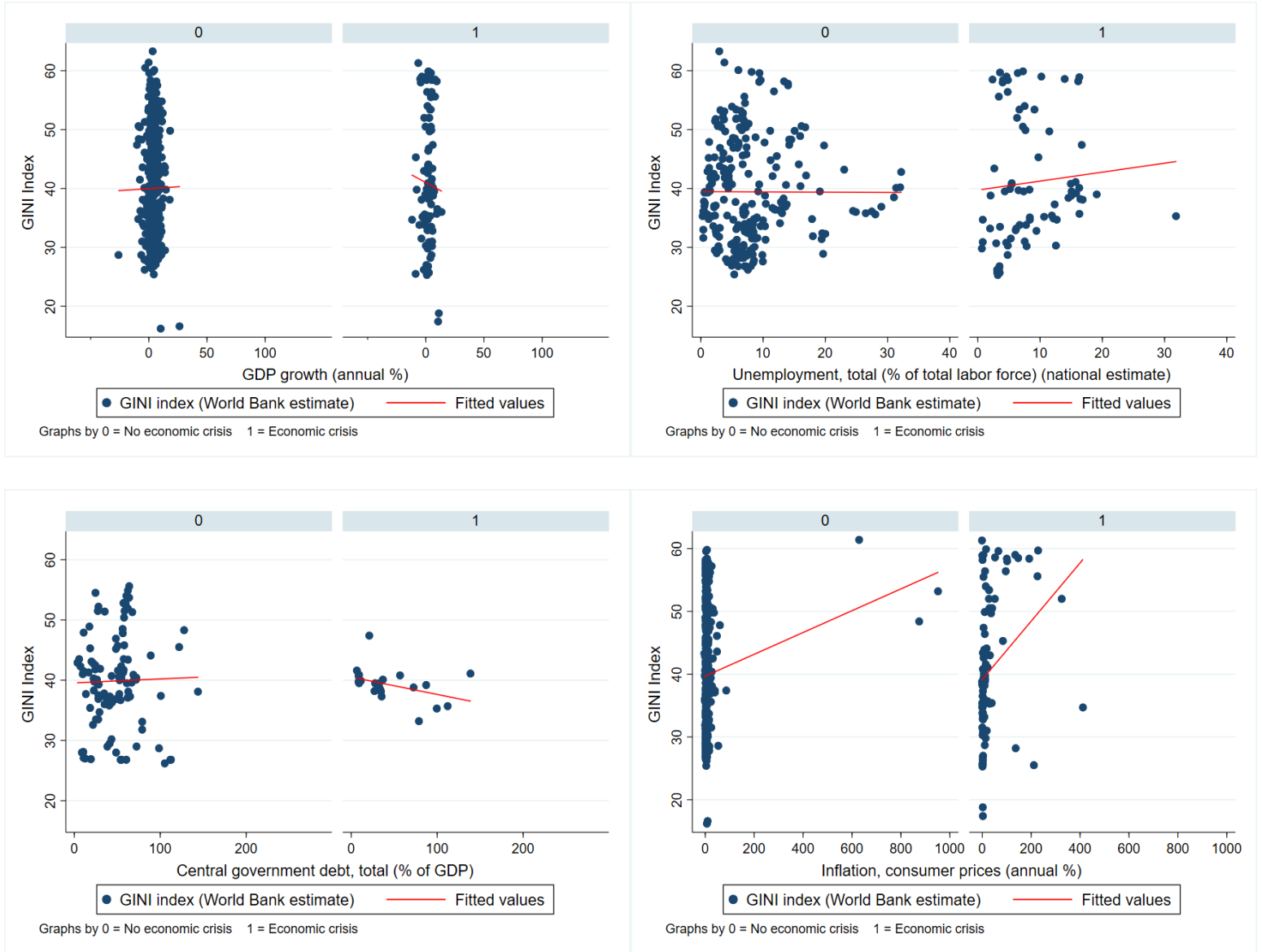
Figure 9: Upper left is equality and GDP growth, upper right is equality and unemployment, lower left is equality and debt, lower right is equality and inflation. 0 is no crisis and 1 is crisis period.

3.6 Crisis duration, population capabilities and equality

Figure 10 aims to show how crisis duration is related to population capabilities (Human Development Index, HDI) and equality (Gini Index). We observed a limited correlation between HDI and crisis duration, while Gini Index has a positive effect on duration of a crisis. This implies that higher inequality correlates with longer crisis duration.
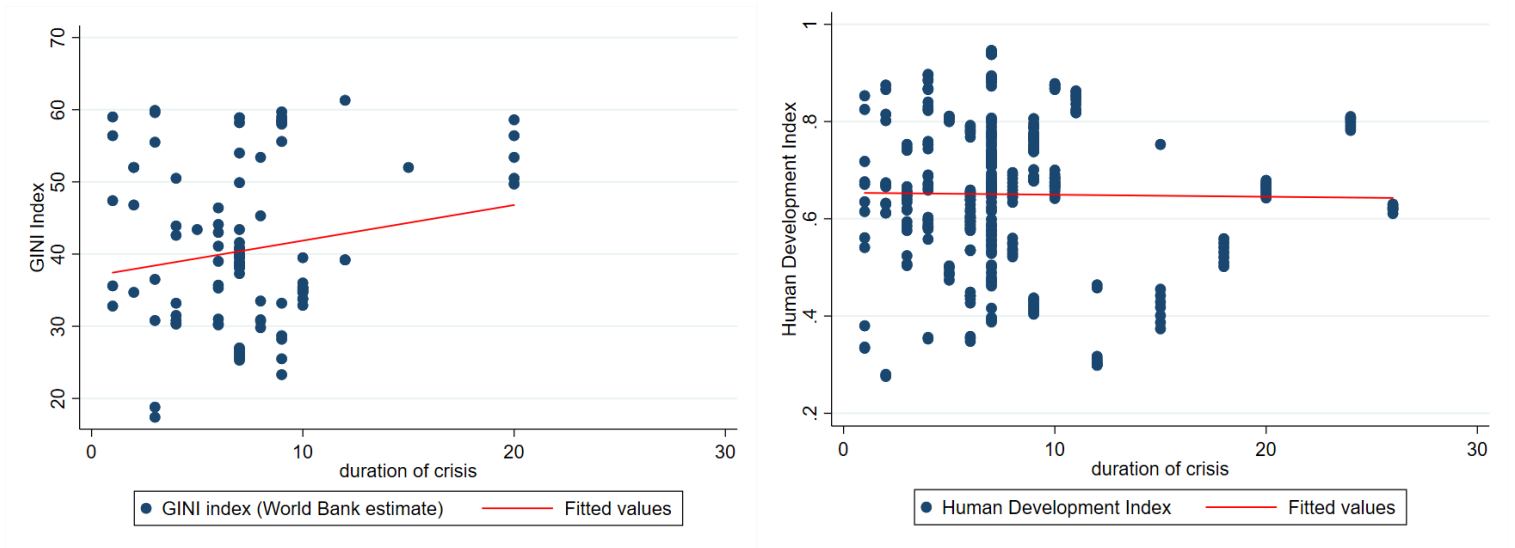
Figure 10: Left is crisis duration and population capabilities. Right is crisis duration and equality.

3.7 Descriptive statistic

Table 4 together with a correlation matrix in Table 5, is a summary of descriptive statistics. In order to compare how the variables differ between periods with and without economic crises, we included the number of observations and the mean in both periods. T0 stands for periods without economic crises and T1 stands for periods with economic crises. In addition, periods without economic crises are colored in grey. The correlation matrix focus on the correlations and significant levels between the variables individually, and is not accounted for control variables. Additionally, the correlation matrix does not distinguish between periods of non-economic crises and economic crises.

Variables	Obs_{t0}	$Mean_{t0}$	Obs_{t1}	$Mean_{t1}$	Std. Dev	Min	Max
Social Trust	295	35,62	873	35,71	16,76	2,84	92,59
Corruption	1329	47,43	4310	47,09	15,60	7,07	74,96
Crisis Duration	4009	0	1103	9,71	7,39	1	27
GDP Growth	2014	4,16	6231	3,81	6,25	-62,08	123,14
Unemployment	763	7,77	2321	7,82	5,88	0,10	37,94
Debt	298	53,10	1062	58,26	87,91	1,89	2007,96
Inflation	1812	22,11	5520	37,96	548,67	-35,84	24411,03
Control variables							
Population capabilities	1131	0,67	3533	0,65	0,17	0,20	0,95
Equality (GINI)	391	40,04	942	39,32	9,89	17,40	65,80

Table 4: Table of summary statistic. Respectively, T0 (grey) stands for periods without an economic crisis and T1 stands for periods with an economic crisis for the variables observation and mean. The rest of the variables is when there is an economic crisis present.

The mean in the Table 4 represents the average of each variables in every country in both periods. According to the table, the mean of social trust is slightly higher, and corruption is a little lower during periods with economic crises compare to periods without economic crises. Apparently, the mean of GDP growth and government debt are lower, unemployment and inflation are higher during economic crises compare to periods without economic crises. Furthermore, the population capabilities and Gini Index are less during economic crises. There are significant differences between how many observations are recorded in these two periods, we have more observations during periods of economic crises. In isolation, this implies that we have a better basis for obtaining reliable results for periods with an economic crisis present. This matches the purpose of this research paper. However, it must be noted that the mean is an average of all countries, but the standard deviation, minimum and maximum within the variables are quite large. This implies that there are large differences between countries. Henceforth, we will acquire a better basis when looking at each country individually or clusters with similar countries than a mean of all the countries.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Social trust	1,00								
2. Corruption	-0,46	1,00							
	(0,00)								
3. GDP Growth	-0,13	0,04	1,00						
	(0,00)	(0,00)							
4. Unemployment	-0,07	0,11	-0,11	1,00					
	(0,11)	(0,00)	(0,00)						
5. Debt	0,27	0,00	-0,06	-0,01	1,00				
	(0,00)	(0,89)	(0,06)	(0,74)					
6. Inflation	-0,09	0,05	-0,07	0,02	0,05	1,00			
	(0,01)	(0,00)	(0,00)	(0,47)	(0,09)				
7. Crisis duration	-0,05	-0,03	-0,01	-0,22	-0,08	-0,04	1,00		
	(0,72)	(0,54)	(0,73)	(0,00)	(0,43)	(0,30)			
8. Capabilities	0,45	-0,66	-0,09	-0,04	-0,03	-0,05	-0,01	1,00	
	(0,00)	(0,00)	(0,00)	(0,08)	(0,30)	(0,01)	(0,78)		
9. Equality (GINI)	-0,52	0,41	0,10	0,04	0,05	-0,01	0,18	-0,47	1,00
	(0,00)	(0,00)	(0,00)	(0,31)	(0,47)	(0,80)	(0,07)	(0,00)	

Table 5: Correlation matrix with significant levels, when there is an economic crisis.

The correlation matrix in Table 5 shows that the linear correlations between some of the variables are relatively low, but most of them are significant ($p < 0,05$). Social trust correlates mostly with corruption (-0,46), population capabilities (0,45) and Gini Index (-0,52). Social trust negatively correlates with corruption and Gini Index. In addition, corruption negatively correlates with population capabilities (-0,66) and positively correlates with Gini index (0,41). Furthermore, crisis duration negatively correlates with unemployment (-0,22). In addition, Gini Index negatively correlates with population capabilities (-0,47). However, correlation values below 0,30 are believed to have low covariance (Pevalin & Robson, 2009).

4 Econometric analysis

The purpose of the econometric analysis is to consider if the indicators of economic crises is related to social trust and corruption during periods with economic crises. We used multiple regression analysis, specifically the OLS method. Furthermore, we also use a stepwise regression method to find any hypothesized mediators. This method is based on the approach of Baron & Kenny (1986). Applying this method, we conducted several regression analyses and examined the significance of the coefficients at each step. In the descriptive analysis, we highlighted how corruption, social trust and crisis duration differ in various regions. However, in the econometric analysis we do not distinct between regions. Moreover, we only consider the time period when it contains at least one economic crisis. We also perform Hausman test to choose between fixed effect estimator and random effect estimator (Black, Hashimzade, & Myles, 2009). The fixed effect row in the regression tables show "no" for random effect estimator and "yes" for fixed effect estimator.

4.1 Hypothesis 1: Economic crisis correlates with social trust

In regression number (1), the coefficient of social trust index is not statistically significant. For this reason, we believe that social trust does not correlate with GDP growth rate in periods with economic crises. Similarly, in regressions number (2), (3) and (4), the table shows that the coefficients of social trust index are not statistically significant. Therefore, we assume that social trust does not correlate with unemployment rate, inflation rate and public debt during periods with economic crises.

	(1) GDP Growth rate	(2) Unemployment rate	(3) Inflation rate	(4) Public debt
Social trust index	0,108	0,0781	-0,546	-0,271
	(1,36)	(0,72)	(-1,45)	(-0,79)
HDI	-8,775	-95,56*	-7,941	140,9
	(-0,87)	(-2,40)	(-0,06)	(1,56)
Gini	0,155	-0,925*	7,171***	-0,734
	(1,11)	(-2,85)	(6,77)	(-0,50)
_cons	-1,491	116,1**	-238,7*	-51,54
	(-0,13)	(4,02)	(-2,41)	(-0,54)
N	28	24	28	10
R^2 within	0,0876	0,721	0,849	0,460
R^2 overall	0,129	0,0118	0,357	0,0300
R^2 between	0,140	0,0629	0,286	0,00645
Fixed effect	No	Yes	Yes	Yes
Prob > F		0,0022	0,0000	0,4352
Prob > chi^2	0,3145			

t statistics in parentheses

$^{*} p < 0,05$, $^{**} p < 0,01$, $^{***} p < 0,001$

Table 6: Regression table for the indicators of an economic crisis and social trust

4.2 Hypothesis 2: Crisis duration correlates with social trust or corruption

In regression number (1), which is equivalent to Hypothesis 2a, the coefficient of social trust index is statistically significant with p-value < 0,05. For this reason, we believe that social trust correlates with the duration of economic crises. For one unit increase in social trust index, the duration of economic crises decreases by 0,0192 years, approximately 1 week. Interestingly, this result corresponds well with Hypothesis 2a.

In regressions number (2), which is equivalent to Hypothesis 2b, the table shows that the coefficient of Bayesian corruption index is not statistically significant. Therefore, we assume that corruption does not correlate with the duration of economic crises.

	(1) Crisis duration	(2) Crisis duration
Social trust index	-0,0192*	
	(-2,55)	
HDI	7,201**	-5,045*
	(2,87)	(-2,55)
Gini	0,0218	0,00245
	(1,04)	(0,17)
Bayesian corruption index		-0,0100
		(-0,41)
_cons	0,703	10,52***
	(0,27)	(5,04)
N	28	81
R^2 within	0,593	0,116
R^2 overall	0,00156	0,000247
R^2 between	0,00697	0,0114
Fixed effect	No	No
Prob > F		
Prob > chi^2	0,0000	0,0787

t statistics in parentheses

*$p < 0,05$, ** $p < 0,01$, *** $p < 0,001$

Table 7: Regression table for duration of economic crisis and social trust (1), and duration of economic crisis and corruption (2)

4.3 Hypothesis 3: Social trust moderates corruption and economic crisis

The regressions in Table 8 shows that Bayesian corruption index is not statistically significant with any of the economic crisis indicators, which are GDP growth rate, unemployment rate, inflation rate and public debt. According to Baron & Kenny (1986), if at least one of the step in steps 1-3 is nonsignificant, mediation is not likely or almost impossible to happen. Henceforth, there is no need to proceed to step 4. For this reason, in Hypothesis 3 we conclude that social trust as a mediator between corruption and economic crisis is not likely. Still, we proceed with step 2-3 to discover possible findings that could be interesting for the discussion and further research.

Step 1

	(1) GDP Growth rate	(2) Unemployment rate	(3) Inflation rate	(4) Public debt
Corruption	-0,0181	0,131	0,746	-0,569
	(-0,40)	(1,23)	(1,01)	(-1,34)
HDI	-6,565	-8,934	-87,01	-106,1
	(-1,47)	(-0,91)	(-1,33)	(-1,35)
Gini	-0,0276	-0,0888	0,310	2,245*
	(-0,52)	(-0,61)	(0,57)	(2,36)
_cons	9,440	13,40	35,94	66,91
	(1,86)	(1,24)	(0,52)	(0,89)
N	81	62	80	23
R^2 within	0,000605	0,0940	0,0200	0,440
R^2 overall	0,0820	0,00935	0,103	0,301
R^2 between	0,00282	0,0471	0,133	0,0694
Fixed effect	No	No	No	No
Prob > F				
Prob > chi^2	0,4743	0,3262	0,2031	0,0311

t statistics in parentheses

$^*p < 0,05$, $^{**}p < 0,01$, $^{***}p < 0,001$

Table 8: Regression table for the indicators of an economic crisis and corruption

The regression in Table 9 shows that Bayesian corruption index is not statistically significant with social trust index during periods with economic crises. Interestingly, corruption and social trust do not correlate during periods with economic crises, while during periods without economic crises they do correlate with each other, see regression table in Appendix. However, Gini Index is statistically significant (p-value < 0,001).

Step 2

	(1) Social trust
Corruption	-0,200
	(-1,05)
HDI	5,796
	(0,20)
Gini	-1,003***
	(-3,57)
_cons	79,42*
	(2,46)
N	28
R^2 within	0,293
R^2 overall	0,753
R^2 between	0,785
Fixed effect	No
Prob > F	
Prob > chi^2	0,0000

t statistics in parentheses

$^*p < 0,05$, $^{**}p < 0,01$, $^{***}p < 0,001$

Table 9: Regression table for social trust and corruption

Step 3 is similar to the regressions in Hypothesis 1 (Table 6) and the results show that social trust is not statistically significant with any of the four economic crisis indicators, which is GDP growth, unemployment, public debt and inflation.

4.4 Hypothesis 4: Economic crisis moderates social trust and crisis duration

The regression in step 1 is similar to Hypothesis 2a (Table 7 - Regression 1). The results show that social trust index is statistically significant and correlates with the duration of economic crises. For one unit increase in social trust index, duration time of economic crises decreases by 0,0192 years.

Step 2 is identical to the regressions in Hypothesis 1 (Table 6). The results from it shows that social trust is not statistically significant with any of the four economic crisis indicators. Based on the regressions in step 1 and step 2, we assume that the four economic crisis indicators, which are GDP growth rate, unemployment rate, public debt and inflation rate, do not moderate the relationship between social trust and crisis duration.

Mediation is not likely or almost impossible to happen, since step 2 is nonsignificant (Baron & Kenny, 1986). Therefore, we conclude that all of the four crisis indicators, as mediators between social trust and crisis duration is not likely. However, we will proceed with step 3.

Step 3

	(1) Crisis duration	(2) Crisis duration	(3) Crisis duration	(4) Crisis duration
GDP growth	0,0223 (1,84)			
Gini	-0,00376 (-0,25)	0,0209 (0,86)	-0,00165 (-0,11)	0 (,)
HDI	-4,863* (-2,40)	-7,618*** (-4,58)	-5,114* (-2,31)	0 (,)
Unemployment		-0,0463** (-2,59)		
Inflation			-0,00232* (-2,19)	
Public debt				0 (,)
_cons	10,19*** (6,09)	11,52*** (6,48)	11,08*** (6,41)	7,043 (,)
N	83	63	82	23
R^2 within	0,126	0,398	0,149	,
R^2 overall	0,000512	0,00321	0,00584	,
R^2 between	0,0301	0,0195	0,0720	0,00106
Fixed effect	No	No	Yes	(,)
Prob > F			0,0429	
Prob > chi^2	0,0425	0,0000		

t statistics in parentheses

$^*p < 0,05,$ $^{**}p < 0,01,$ $^{***}p < 0,001$

Table 10: Regression table for the indicators of an economic crisis and the duration of an economic crisis

According to the regressions in Table 10, GDP growth (1) is not statistically significant with the duration of economic crises. However, unemployment (2) and inflation (3) is statistically significant with respective p-value of $p < 0,01$ and $p < 0,05$. For this reason, we believe that unemployment and inflation correlate with the duration of economic crises. For one unit increase in unemployment, the duration time of economic crises decreases by 0,0463 years (~17 days). Interestingly, this contradicts with our arguments in the theoretical section. However, this could

suggest that countries who experienced high level of unemployment during economic crises would invest more in policy responses, which in turn would have a positive effect on the duration of economic crises. Furthermore, for one unit increase in inflation, the duration of crises decreases by 0,00232 years.

For regression number (4), unfortunately, the dataset lacks observations for public debt and the control variables during crisis, to generate the estimations for the coefficients. For that reason, we cannot use the results of regression number (4) to examine this step in the Hypothesis 4.

4.5 Hypothesis 5: Economic crisis moderates corruption and crisis duration

Step 1 is similar to the regression in Hypothesis 2b (Table 7 - Regression 2). The results show that the Bayesian corruption index is not statistically significant with the duration of economic crises. Step 1 is nonsignificant and mediation is not likely to happen (Baron & Kenny, 1986). Therefore, we conclude that any of the four crisis indicators, as a mediator between corruption and crisis duration is not likely to happen. However, we will proceed with step 2 and 3.

Step 2 is same as the regressions in step 1 of Hypothesis 3 (Table 8). The result shows that Bayesian corruption index is not statistically significant with any of the economic crisis indicators, which are GDP growth rate, unemployment rate, inflation rate and public debt. Furthermore, step 3 is similar to the regressions in step 3 of hypothesis 4 (Table 10). The results show that GDP growth is not statistically significant with the duration of economic crises. On the other hand, both unemployment and inflation are statistically significant with the duration of economic crises. For one unit increase in unemployment, the duration of economic crises decreases by 0,0463 years. Furthermore, for one unit increase in inflation, the duration of economic crises decreases by 0,00232 years. Unfortunately, for public debt we lack enough observations to generate the estimations for the coefficient and could not examine this step further.

4.6 Hypothesis 6: Equality correlates with economic crisis

In Hypothesis 1 (Table 6) and Hypothesis 3 step 1 (Table 8) we found that social trust and corruption do not correlate with any of the four economic crisis indicators. We assume, during periods with economic crises, that both social trust and corruption do not have any relations to the indicators of an economic crisis. Therefore, in this hypothesis we will not include social trust and corruption.

In regression number (1), the coefficient of Gini Index is statistically significant with p-value $p < 0,05$. For this reason, we believe that Gini Index correlates with GDP growth in periods with economic crises. For one unit increase in the Gini Index, the GDP growth decrease by 0,345 percentage points. This means that one unit increase in inequality, the GDP growth decrease by 0,345 percentage points. In the regression number (2) the coefficient of Gini Index is not statistically significant with the unemployment rate. Therefore, we assume that Gini Index does not correlate with unemployment during periods with economic crises.

Furthermore, the regression table shows that the coefficients of the Gini Index in regression number (3) and (4) are statistically significant with respectively p-value, $p < 0,05$ and $p < 0,01$. Accordingly, we assume that Gini Index correlates with inflation rate and public debt. For one unit increase in GINI index, the inflation rate increase by 4,978 percentage points and the public debt increase by 3,284 (% of GDP). This means that one unit increase in Gini Index, the inflation rate increases by 4,978 % and public debt will increase by 3,284 (% of GDP). The results in the regressions (1) and (3), respectively Hypothesis 6a and 6d, correspond well with the hypotheses. Interestingly, the regression number (4), which is equivalent to Hypothesis 6c, contradicts with the descriptive analysis.

	(1) GDP Growth rate	(2) Unemployment rate	(3) Inflation rate	(4) Public debt
Gini	-0,345*	-0,0135	4,978*	3,284**
	(-2,06)	(-0,10)	(2,60)	(3,65)
HDI	29,69	-11,78	-417,3	83,47
	(1,18)	(-1,28)	(-1,46)	(0,96)
_cons	-5,061	18,30*	126,1	-144,2
	(-0,26)	(2,02)	(0,55)	(-1,84)
N	83	63	82	23
R^2 within	0,117	0,0240	0,172	0,548
R^2 overall	0,00481	0,0107	0,0470	0,464
R^2 between	0,0211	0,0359	0,0375	0,433
Fixed effect	Yes	No	Yes	Yes
Prob > F	0,0418		0,0080	0,0127
Prob > chi^2		0,4375		

t statistics in parentheses

$^{*}p < 0,05,$ $^{**}p < 0,01,$ $^{***}p < 0,001$

Table 11: Regression table for the indicators of an economic crisis and equality

4.7 Summary of the econometric analysis

In summary, we have used different regressions models to explore the relationship between the indicators of economic crisis, social trust, corruption and equality. The results imply statistical evidence to keep Hypothesis 2a, 6a, 6c and 6d at the following significance level of 5%, 5%, 1% and 5%. On the contrary, we reject the Hypothesis 1, 2b, 3, 4, 5 and 6b, since we cannot conclude with statistical inference. However, we found some interesting connections, such as that unemployment and inflation negatively correlate with the duration of economic crises. Even if unemployment and inflation do not moderate the relationship between crisis duration and social trust, corruption or equality, they still correlate with crisis duration. Furthermore, social trust and corruption correlate with each other during non-economic crises periods, and not when there is at least one economic crisis present. Finally, even though several of the relationships in steps 1-3 for Hypothesis 3, 4 and 5 are nonsignificant, and mediation is likely or not possible, this is not always true (see Mackinnon, Fairchild & Fritz, 2007).

4.8 Fitness of the model

The F-test results are reported for fixed-effect models and the chi-square test results are reported for random effect models. These results reflect how well our regression models fit the data better than models without any independent variables. The rule of thumb is that the F-test and the chi-square test results should be less than 0,05 for us to reject the null hypothesis of the two tests. The null hypothesis for these tests is defined as "the model with no independent variables fit the data as well as our model" (Wooldridge, 2016). The models of Hypotheses 2a, 6a, 6c and 6d have results lower than 0,05 in the F-test and the chi-square test. Accordingly, it is safe to reject the null hypothesis. Additionally, we reported three kind of R-squared for each regression. The three types are *within*, *between* and *overall*. However, we choose not to use R-squared as measure for goodness-of-fit, since R-squared can result in misleading conclusions (Wooldridge, 2016). We report the values only for the sake of information. Furthermore, based on the regression results, we will conduct comparative fit index on the structural equation model (see Figure 11 in the theoretical implications). The comparative fit index is equal to 1,00, which is larger than 0,90 (Hooper & Mullen, 2008), so we are confident to confirm our belief regarding the fitness of our model.

5 Discussion

The purpose of this chapter is to discuss our findings in relation to the theoretical framework, and to address what our findings mean for professionals in the fields that have been examined. Finally, we will discuss the limitations of our study and of the research process, before we highlight some interesting topics for the road ahead.

5.6 Theoretical implications

One of the findings in the econometric analysis is that social trust negatively correlates with the duration of economic crises. For one unit increase in social trust index, the duration time of economic crises decreases by 0,0192 years, approximately 1 week. This means that higher trust reduces the duration of economic crises, and lower trust increases the duration of economic crises. One week could seem very little compared to the "year" unit that measures the duration of economic crises. However, social trust is measured as an index score, which represents an average from all the surveys in a country each year. Therefore, the level of social trust will not drastically change from high to low within a year. On the other hand, higher level of social trust is correlated with stronger democratic institutions and higher economic growth. These factors are also the foundations of economic equality (Bjørnskov, 2009; Richey, 2010). Furthermore, social trust is created by economic equality, equality of opportunity and incorrupt governments (Rothstein, 2005). This indicates that a high level of social trust upholds a high level of equality, which in turn will increase the level of social trust (Uslaner, 2012). Therefore, when there is a change in social trust, either for the better or for the worse, the direction of that change will stay the same (vicious or virtuous circle effect). Even if the changes are smaller in the short run, in the long run the changes may be greater.

Moreover, the duration of a crisis increases with the complexity of an economic crisis, and the complexity is related to the severity of the impact (Laeven & Valencia, 2018). This indicates that social trust may reduces the duration of economic crises by reducing the complexity and the severity of economic crises. Social trust can indirectly reduce the severity of the impact through facilitating investments in infrastructure and in welfare policies. Moreover, in society with a high

level of social trust, the controlling cost between economic agents is considerably lower. Therefore, governments have larger funds to use in investments (Uslaner, 2002; Graeff & Svendsen, 2013). On the other hand, lack of trust could increase the gap between rich and poor. For this reason, low social trust increases the inequality and decreases the effectiveness of welfare programs, together worsening a country's recovering abilities (Soss, 2001; Tella & MacCulloch, 2009; Uslaner, 2012).

Another finding in our research is that Gini Index correlates with GDP growth, public debt and inflation during periods with economic crises. We found that for one unit increase in inequality; the GDP growth decreases by 0,345 percentage points, the public debt increases by 3,284 (% of GDP) and the inflation rate increases by 4,978 %. The link between equality and trust can be explained by economic inequality and equality of opportunity (Rothstein, 2005). This indicates how closely related social trust, economics and equality are to each other. Therefore, we believe that there are connections between social trust, economics and equality. For a better overview of the research findings and how they are related to each other, we present a new framework:
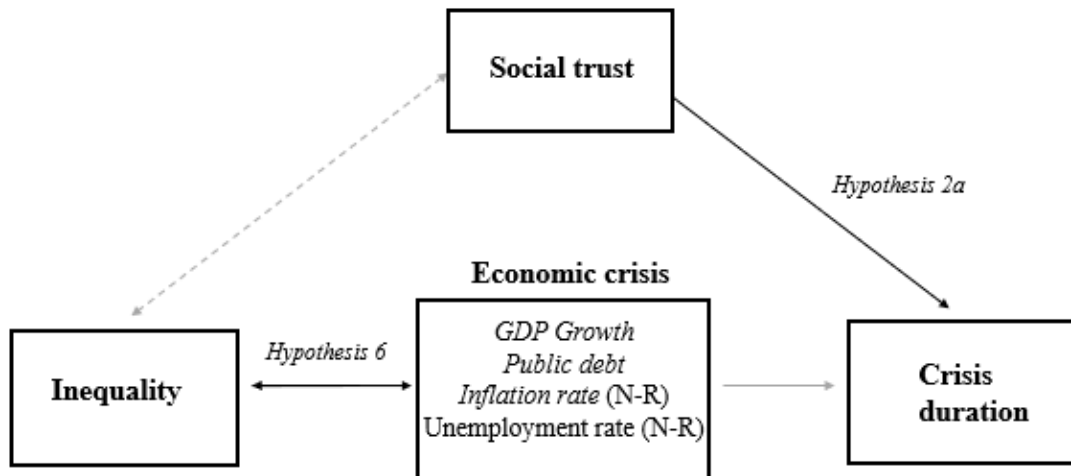

Figure 11: Finalized conceptual framework and findings. *Source:* Own depiction, *solid black arrows* indicates confirmed hypothesized relationships, *dashed arrows* indicate non-confirmed and non-hypothesized relationships, *solid grey arrow* indicate confirmed non-hypothesized relationship. Indicators of economic crisis: indicators in *italic* indicates part of confirmed hypothesized relationships, indicators with N-R means indicator is part of confirmed non-hypothesized relationship.

However, the most interesting question is how can (in) equality have an impact on economic crisis through GDP growth, public debt and inflation rate, or how could these three indicators of an economic crisis have an impact on (in) equality? In societies with high level of inequality, people feel that they are not treated fairly and that they do not share the same destiny with each other (Rothstein, 2005). For this reason, it is more difficult to implement universal welfare programs during an economic crisis. Universal welfare programs reward all the people in a society equally, but are rarely established in a country that has a high level of inequality. The reason is low public support and unsuccessful implementations, because the poor will not share any benefits with the rich in a society with high inequality and low trust (Rothstein, 2005). A common practice in these countries is the implementation of means-tested programs, which reward specific groups in a society by some selection methods (Tella & MacCulloch, 2009). These programs often create a sense of resentment from the poor by treating them differently than other groups (Soss, 2001). Moreover, local economic crises may decrease government revenues and affect the supplying of public goods (Dix-carneiro et al., 2017). Either way, societies with a high level of inequality need to use more resources in the investments of policy responses. This results in an increase in the debt/GDP-ratio, and therefore, an increase in inflation rate and a reduction in GDP growth, see Appendix for a macroeconomic explanation of this.

Welfare state support is less related to perceived crisis impact when social spending is high. This indicates that encompassing welfare states reduce the subjective impacts of a crisis (Blekesaune, 2013). For this reason, individuals in a society with a high level of equality depend less on state benefits during periods of economic crises. Moreover, social consequences of economic downturns are distributed unevenly among individuals, because of consequences that are label as "social class" risks (Eurofund, 2012; Rueda, 2012; Sachweh, 2017). In general, members of disadvantaged groups are exposed to greater social risks during economic downturns than members of privileged groups (OECD, 2014; Chzhen, 2016). Disadvantaged groups have fewer economic resources as a buffer for material consequences of economic downturns. Therefore, they are more dependent on state benefits to maintain their standard of living than members of privileged groups (Kluegel, 1988). In countries with higher level of inequality, the ratio of

disadvantaged groups is expected to be larger compared to countries with lower level of inequality. A larger ratio of disadvantaged groups required more state benefits and leads to an increase in public debt. Furthermore, the increase in social spending, in Europe, was smallest in countries that was most affected by the crisis. This phenomenon indicates that there are differences among countries' capacities to handle the consequences of economic downturns (Leschke & Jespen, 2012). European welfare states still differ in their institutional design, generosity, social and labour market policy responses to the crisis, suggesting that inequality could be a result of how some countries differ in their institutional design, generosity, policies and capability to handle a crisis (Scruggs & Allan, 2006; Starke et al., 2013; Van Hooren et al., 2014).

Furthermore, we found that unemployment and inflation negatively correlate with the duration of economic crises. Even if they do not moderate the relationship between crisis duration and social trust, corruption or equality, they still correlate with crisis duration. This means that the duration of economic crises increases when there is a decrease in both unemployment and inflation. From the theory, the duration of a crisis increases with the complexity of an economic crisis, and the complexity is related to the severity of the impact (Laeven & Valencia, 2018). At first glance, it looks like the findings contradict with this theory. Normally, we would think that a decrease in both unemployment and inflation would mean a reduction in both complexity and severity. Hence, a reduction in crisis duration, but this may not always be the case. The reason is that there are differences between countries and their capacities to handle the consequences of economic downturns (Leschke & Jespen, 2012; Scruggs & Allan, 2006; Starke et al., 2013; Van Hooren et al., 2014). As we mentioned during the econometric analysis, countries who experienced a high level of unemployment during an economic crisis may invest more in policy responses. The policies, in turn, would have a positive effect on the duration of an economic crisis.

Finally, we found that social trust and corruption correlate with each other during non-economic crisis period, but not when there is at least one economic crisis present. What could be the differences between periods with and without economic crises that influence the correlation between corruption and social trust? In the theory part, we discussed that corruption and social

trust are related through: 1) generalized trust, for example subjective generalization of trustworthiness from corrupt public officials to the whole population (Rothstein, 2012), 2) through economic inequality or equality of opportunity (Rothstein, 2005) and 3) particularized trust, for example distrust of people outside of their social circle (Uslaner, 2002). It is difficult to claim that the relationship between corruption and social trust is caused by one of the three reasons, but rather a combination of them. From our results, social trust and corruption do not correlate with any of the four indicators of economic crisis. However, equality does correlate with three of the economic crisis-indicators, and only social trust correlate with the duration of economic crises. This indicates that point 2) is not the caused for the differences between periods with and without economic crises.

Could an economic crisis affect this relationship through generalized or particularized trust, by having an impact on how individuals perceived the crisis consequences? The theory indicates that the consequences of an economic shock may be constrained by the level of information and the level of education (Hariri et al., 2016). Furthermore, uncertainty in news may reduce customer confidence, due to lower expectations or higher pessimism (Svensson et al., 2016; van Dalen et. al, 2017). Therefore, the way governments or experts appear in the news during an economic crisis may affect how individuals generalized their trust. This may render the relationship between trust and corruption invalid. Furthermore, some economic shocks reduce people's sense of well-being, and that financial crisis adds a non-negligible cost to individuals' well-being (Hariri et al., 2016; Montagnoli & Moro, 2014). Moreover, there have been several existing studies about how the financial crisis of 2007 impact negatively on mental health (see Katikireddi et al., 2011; Barr et al., 2012; Gili et al., 2013). This can negatively influence mental health during an economic crisis and affect the particularized trust among individuals. Therefore, the relationship between corruption and social trust, during an economic crisis, may be affected. Nevertheless, the connections between social trust and corruption require more insights and will be brought up again under the discussion about further research.

5.7 Practical implications

In the theoretical implications, we discussed that social trust reduced the duration, the complexity and the severity of economic crises. Governments can use this information to implement policies during or before economic crises to increase social trust, which in turn reduces the duration and complexity of an economic crisis. Social trust can be created by: 1) society-centred approach, social trust is generated when citizens interact with social activities (Hooghe & Stolle, 2003), 2) equality-centred approach, social trust is generated from economic equality and equality of opportunity (Rothstein, 2005) and 3) institution-centred approach, social trust is developed when there is an honest, incorrupt and efficient government (Rothstein, 2013). However, the first approach does not align well with empirical researches (see Rothstein, 2013; Delhey & Newton, 2003). Moreover, our findings indicate that social trust and corruption do not correlate during economic crises. Hence, the policies should focus on the equality-centred approach. Furthermore, our findings indicate that an increase in equality during economic crises may increase GDP growth, reduce public debt and reduce inflation rate. Therefore, equality-based policies could benefit a society in several ways during an economic crisis.

Policies that may increase equality and create social trust to reduce the impacts economic crises:

1. Increase economic equality by implementation of *welfare programs*, in this way resources are fairly distributed among members of a society.
2. Introduce *minimum wages* in industries that do not have it, in this way it can reduce economic inequality.
3. Implement (capital gains) *tax rates that is equal with income tax rates and payroll tax rates*, so that the wealthy pay the same tax rate as everyone else.
4. Increase equality of opportunity by implementation of *universal education programs*.

Welfare programs

The most common types of welfare programs are universal welfare programs and means-tested welfare programs. Universal welfare programs reward all people equally, regardless of their social class or income. Means-tested welfare programs reward specific groups through some

selection methods (Rothstein, 2005). We recommend using universal welfare programs to avoid treating disadvantaged groups differently from other groups. Mean-tested programs create resentment from unfortunate individuals towards the wealthy, and decrease social trust instead of increasing it (Soss, 2001; Rothstein, 2005; Uslaner, 2012). On the other hand, it could be difficult to gain public support to implement universal welfare programs in a society with low social trust, particularly during periods of economic constraint (Rothstein, 2005). The reason is that the unfortunate individuals may think that there is no reason for the wealthy to receive any benefits from the state. Henceforth, they would demand some types of resource redistributions from the wealthy to the poor. Therefore, many politicians usually choose means-tested welfare programs, which will only worsen the situation, especially during downturns (Tella & MacCulloch, 2009). In situations where there is not enough public support to initiate universal welfare programs, it is better not to implement other welfare programs that may results in higher inequality.

Minimum wages

Sticky wages are wages that cannot keep up with the inflation rate, if set in advance. This results in that the payments of many workers fall below the poverty level, especially during economic downturns (Kahn, 1997; Fehr & Goette, 2005). Therefore, higher wages for the lowest-paid workers has the potential to lift them out of poverty, to boost their families' income and to raise the workers living standard (Neumark & Wascher, 2007). This indicates that setting a minimum wage may reduce economic inequality. The expenses of the government may also reduce, since the need for welfare programs would be less demanded, particularly during economic crises. At the same time, the government revenues would slightly increase, generated from higher payroll taxes. The increase revenues could be used for investments to further fight the economic inequality. On the other hand, several studies find that increasing minimum wages to help the poor, do little to improve income equality (Wu, Perloff, & Golan, 2005; Campolieti, Gunderson & Lee, 2012; Sabia & Nielsen, 2013). The reason is that most workers, who are affected by the minimum wages increase, are not poor (Sabia & Burkhauser, 2010). Furthermore, it may slower the process of hiring, increase layoffs or provide incentives to outsource labor to countries where minimum wages are lower (Neumark & Wascher, 2000; Fehr & Goette, 2005). A solution for

this is pro-work policies, such as work requirements for public assistance and expansions in state supplements to EITC (Earned Income Tax Credit) in the US or WITB (Working Income Tax Benefit) in Canada. These policies target the poor individuals and minimize spillover benefits to persons with higher income (CBO, 2007; Sabia & Burkhauser, 2010; Campolieti, Gunderson & Lee, 2012).

Same tax rates for everyone

In many countries, the profits from the sale of real estates or investments are privileges, making investment to generate more income than actual work, take the US for an example (CRFB, 2013). It is an irony that the tax rates for the wealthy is declining even if their wealth and income is increasing drastically. In a society with low trust, the poor believe that rich people gain their wealth by unfair advantages and they will not share any benefits with the wealthy people (Rothstein, 2005). For this reason, unfortunate individuals will demand some sort of resource-redistributions from the rich to the poor. Furthermore, in the case of Sweden, capital gains increase the inequality of the top income earners in recent decades (Roine & Waldenström, 2012). Capital gains are also a reoccurring addition rather than a temporary component in the high-income groups. On the other hand, there are not any evidence regarding the changes between low income groups or top income groups, in terms of capital gains as reoccurring addition (Roine & Waldenström, 2012). Therefore, tax rates from capital gains, which is the profit from sales of capital assets, should be adjusted so that they are equal with payroll and income tax rates. Beside reducing economic inequality, this type of policies may reduce the feeling of unfairness towards the wealthy from the poor and increase social trust. The government tax revenues would increase, but if the tax raises are too high it could potentially cause investors to reduce their capital gains (CRFB, 2013).

Universal education programs

Differences in income, early education and school quality are the key components that contribute to sustained inequality over generations (Thomas, Wang & Fan, 2001; Checchi, 2001). Therefore, investment in education starting in the childhood, such as kindergarten programs and

primary school for everyone, can increase productivity and reduce inequality (Heckman, 2011). Programs targeting disadvantaged children will likely generate higher economic returns for those children. On the other hand, universal education programs benefit a greater number of children and generate a higher total of net positive benefits (Barnett, 2010). The benefits of investments in education, such as higher income and better health accumulate over time (Day & Newburger, 2002; Mirowsky & Ross, 2005). For that reason, policymakers usually invest in policies with more short-term benefits. However, education has the potential to strengthen the economic prospects. Education also enhance the equality of opportunity and is one of the most critical factors to enhance social trust (Brehm & Rahn, 1997). During economic downturns, however, it seems foolish to invest in something that yield limited profit in the near future. States can start with targeted programs with a goal to move over to high-quality universal programs. Another solution is targeting specific geographical areas, which will be available for all the children regardless of their social class. Furthermore, targeting geographical areas reduces the cost of selection methods to identify which children are qualified for the program, and potentially reduces the stigmatizing of children within a program (Checchi, 2001).

In addition, organizations such as IMF and World Bank can benefit from our results. The key mission of IMF is to ensure the stability of the international monetary system (IMF, 2019). One way they keep track with the global economy is monitoring the economic and financial policies of its member countries. As part of this process, IMF highlights possible risks to stability and advises on needed policy adjustments (IMF, 2019). Therefore, IMF can use our research findings to gain better insight of economic crises, which play a major role in financial stability, and possible factors behind them. IMF can also make better recommendations for adjustment of policies to its member countries. In this way, they ensure financial stability, since better insights may result in higher growth, create more jobs and strengthen the economy. Moreover, World Bank may use our research findings to advance the pursuit of their missions. According to World Bank, the organization has two missions, which are "To end extreme poverty" by reducing the rate of global population that live in extreme poverty to 3 percent in 2030, and "to promote shared prosperity" by improving the income of the poorest 40 percent of population in every country (World Bank, 2019). For that reason, World Bank can utilize our findings to promote

policy advice, as well as financial and technical assistance to governments of developing countries. Finally, professionals in different academic fields - political science, corruption study, sociology and economics - can use our research paper to better understand their fields. They can also capture how the distinct fields are connected to each other.

5.8 Limitations

One of the limitations of our research is the usage of secondary data. In this research, we utilize data from The Quality of Government Institute Database (QoG) and from The Behavioral and Financial Stability Project database (BFFS Project). Both data sources are extremely reliable since they are operated by some of the best professionals in their fields. The Quality of Government Institute Database is recommended to us by Professor Bo Rothstein, who is also the co-founder of QoG Institute. Professor Bo Rothstein is a Swedish politician scientist, he is currently holding the August Röhss Chair in Political Science in Department of Political Science of University of Gothenburg, before that he was a professor at University of Oxford and Blavatnik School of Government (University of Gothenburg, 2017). The database from BFFS Project is collected by Professor Carmen Reinhart. She is a professor of the International Financial System at Harvard Kennedy School. She was nominated in the list of 50 most influential financial professors by Bloomberg Markets magazine two times in 2011 and 2012 (Reinhart C. M., 2019). Even if the sources are very trustworthy, the data might be collected for other purposes that are unrelated to our research. For that reason, there are possibilities that the deficiency reduces the effectiveness of our empirical models.

Additionally, there is a mismatch between the two data sources. The variables that are included in QoG database mostly comprise of 100 to 190 countries and territories. However, the database from the BFFS Project only covers 70 countries and territories. There are also imbalances among observations of QoG databases. Not all the variables from QoG database, contain needed information for the current research paper. This irregularity, which reduces the number of observations for our research, may decrease the efficiency of the empirical interpretations (Saunders et al., 2016). Moreover, we cannot gather data for the exact duration of economic

crises. We use "year" as unit to measure crisis duration, so our data may overstate or understate the duration of some economic crises. The reasons for this problem were discussed in more detail in the part of "weaknesses in the data".

Furthermore, there is several methods to test for mediation. The method used to test for mediation in Hypothesis 3, 4 and 5, usually addressed as Baron and Kenny four-steps approach, has potential flaws (Baron & Kenny, 1986). One of the problems is that the method does not test for the significance of the indirect pathway. As an example, we use the figure below to illustrate the first three steps of Baron and Kenny approach.
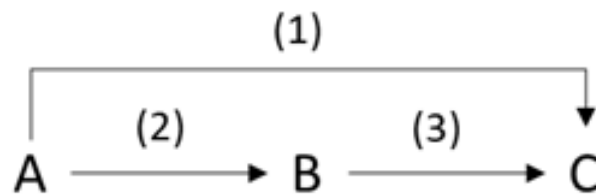

Figure 12: Example of test for mediation

In this example, we want to test that variable B acts as a mediator between variables A and C. Step (1) tests the significance of A to C. Step (2) tests the significance of A to B. Step (3) tests the significance of B to C. If they are all significance, we will move to the last step, which is to test for the significance of A to C while control for B. As a result, this approach cannot test the significance of the indirect pathway from of A to C through B, see Appendix for further details about the regression method. One of the alternative approaches, introduced by Judd and Kenny (1981), allow researchers to compute the indirect coefficient and then test for its significance.

Another limitation of our research is that the topic is unfamiliar. Consequently, there are not many articles that are directly related to our topic. Therefore, we must combine articles from several different academic fields to form our theoretical foundation. We also used both recent

and well-established theories and research findings to strengthen the theoretical foundation in this research paper. We include materials from different fields, respectively political, sociology, economics and corruption, to broaden the literature review for our research paper.

In this project, the data that we used were collected from several countries through many different periods of time. These datasets allow us to conduct our analyses on a large number of observations. Although, a large number of observations is not necessarily implying that we have more information. It still allows us to increase our degree of freedoms and to reduce the collinearity among the explanatory variables. That will, in turn, increase the efficiency of our empirical analysis (The University of Texas at Austin, 2015). Additionally, the nature of our research paper is to establish a general understanding of the relationships between economic crisis and social trust, as well as economic crisis and corruption. There are other limitations, which are weak foundations in existing theories and limited researches in the subject. Henceforth, we try to increase the internal validity of our research through rich data collection as the basis for theoretical connections in our model (Saunders et al., 2016). We also attempt to maintain a high level of external validity for our research findings. The variables that we used are available in many countries, so we believe that our research findings would also apply for these countries. In addition, we keep our mindset neutrally during the research period, to strengthen our understanding of the ambiguous relationships between the variables (Saunders et al., 2016).

5.9 Ideas for further research

During the exploration of our topic, we learned that Bayesian corruption index and social trust index are correlated. Therefore, the theoretical foundation and the hypotheses in this research paper is based on that finding. However, in the econometric analysis, we observed that during periods of economic crises, Bayesian corruption index and Social Trust Index are not correlated anymore (Table 9). We then discovered that in non-economic crisis periods, Bayesian corruption index and Social Trust Index are significantly correlated (Table 12). The discovery, in our personal opinions, are very fascinating and may open potential research ideas in the future. For

instance, we are wondering what are the differences between crisis periods and non-crisis periods that influence the correlation between corruption and social trust. The understanding of the differences between crisis period and non-crisis period, may help to strengthen the knowledge about the relationship of corruption, social trust and economic crisis. From the theoretical implications, ideas for further research could be how generalized trust or particularized trust affect the relationship between corruption and social trust. Furthermore, the purpose of this paper is to establish possible correlations between social trust, corruption with economic crisis. Therefore, we do not know the reasons behind the correlations. Future research may use the established correlations in this paper to study what is the reasons behind the correlations between social trust and the duration of economic crises, or between equality and some of the "economic crisis"-indicators.

In this research paper, we only used objective indicators of economic crisis. The indicators are measured as GDP growth, unemployment, public debt and inflation rate. We used these indicators to measure the scale of the economic crises. However, the damage of economic crises can be subjective. In other words, economic crises may harm a society by affecting its citizens directly. For example, economic shocks can correlate with drug abusing, suicide rates, alcohol consumption and other psychological factors (Barr, Taylor-Robinson, Scott-Samuel, McKee & Stuckler, 2012). We believe that the subjective indicators can describe the economic crises on another perspective. Therefore, future research may collect theories and data about the subjective indicators to measure the severity of an economic crisis. The relationship between social trust, corruption and economic crisis may also vary from country to country and from region to region. For this research paper, we incorporate the data of several countries to test our hypotheses on a general level. Future research can be conducted using data from specific countries or regions. We believe the results from those studies can be used by many other academic fields besides economics, such as psychology, culture, history, political science.

Conclusion

In summary, the main purpose of our thesis paper is to explore possible relationships between social trust, corruption and economic crisis. The topic seems unfamiliar, since there are limited models or academic literatures that are directly related to the topic of our choice. For that reason, our theoretical foundation is based on the combination of literatures from different academic fields, especially from political science, corruption study and economics. We then further strengthen our arguments with both descriptive analysis and econometric analysis of secondary data. Our dataset is collected from "Quality of Government Institute" as well as "The Behavioral and Financial Stability Project", and includes 11364 observations. Our quantitative results show that social trust is correlated with the duration of economic crises. Additionally, we discover that equality, which is one of the main factors that directly influence social trust, is correlated with three out of four economic crisis indicators. These three indicators are GDP growth rate, inflation rate and public debt. The last indicator that does not correlate with equality is unemployment rate. Based on the results, we then discuss the results with respect to theoretical implications, practical implications, limitations and further research.

References

Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The Colonial Origins of Comparative Development: An Empirical Investigation. The American Economic Review, 91(5), 1369-1401.

Agri, E. M., Mailafia, D., & Umejiaku, R. I. (2017). Impact of Economic Recession on Macroeconomic Stability and Sustainable Development in Nigeria. *Science Journal of Economics, 2017*, 1-12. doi:10.7237/sje/130

Andrea Petermann, J. I. (2007). Mining and corruption. Resources Policy, 32(3), 91-103.

Aslaksen, S. (2007). Corruption and Oil: Evidence from Panel Data.

Autor, D. H., Dorn, D., & Hanson, G. H. (2013). The China Syndrome: Local Labor Market Effects of Import Competition in the United States. *American Economic Review, 103*(6), 2121-2168. doi:http://dx.doi.org/10.1257/aer.103.6.2121

Barnett, S. W. (2010). Universal and Targeted Approaches to Preschool Education in the United States. *International Journal of Child Care and Education Policy, 4*(1), 1-12. doi:https://doi.org/10.1007/2288-6729-4-1-1

Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Barr, B., Taylor-Robinson, D., Scott-Samuel, A., McKee, M., & Stuckler, D. (2012). *Suicides associated with the 2008-10 economic recession in England: time trend analysis.* BMJ 2012:345. doi:https://doi.org/10.1136/bmj.e5142

Bermeo, N. G., & Pontusson, J. (2012). *Coping with Crisis: Government reactions to the Great Recession.* New York: Russel Sage Foundation.

Bjørnskov, C. (2009). Economic Growth. Handbook of Social Capital, 337-353.

Bjørnskov, C. (2012). How does social trust affect economic growth? Southern Economic Journal, 78(4), 1346–1368.

Black, J., Hashimzade, N., & Myles, a. G. (2009). A Dictionary of Economics. Oxford University Press.

Blekesaune, M. (2013). Economic Strain and Public Support for Redistribution: A Comparative Analysis of 28 European Countries. *Journal of Social Policy, 42*(1), 57-72. doi:10.1017/S0047279412000748

Boix, C., & Posner, D. N. (1998). Social Capital: Explaining Its Origins and Effects on Government Performance. British Journal of Political Science, 28(4), 686–693.

Brehm, J., & Rahn, W. (1997). Individual-Level Evidence for the Causes and Consequences of Social Capital. American Journal of Political Science, 41(3), 999-1023.

Burns, A. F., & Mitchell, W. C. (1946). *Measuring Business Cycles.* New York: NBER Books, National Bureau of Economic Research, Inc.

Campolieti, M., Gunderson, M., & Lee, B. (2012). The (Non) Impact of Minimum Wages on Poverty: Regression and Simulation Evidence for Canada. *Journal of Labor Research, 33*(3), 287-302. doi:https://doi.org/10.1007/s12122-012-9139-8

CBO. (2007). *Response to a request by Senator Grassley about the effects of increasing the federal minimum wage versus expanding the Earned Income Tax Credit.* Washington, DC: Congress of the United States, Congressional Budget Office.

Checchi, D. (2001). *Education, Inequality and Income Inequality.* Milan: LSE STICERD Research Paper No. 52. Retrieved from https://ssrn.com/abstract=1094825

Chzhen, Y. (2016). Perceptions of the Economic Crisis in Europe: Do Adults in Households with Children Feel a Greater Impact? *Social Indicators Research, 127*(1), 341-360. doi:10.1007/s11205-015-0956-z

Claessens, S., Dell'Ariccia, G., Igan, D., & Laeven, L. (2010). Cross-country experiences and policy implications from the global financial crisis. *Economic Policy, 25*(62), 267-293. doi:https://doi.org/10.1111/j.1468-0327.2010.00244.x

Collier, P., & Goderis, B. (2007). Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum. CSAE Working Paper Series from Centre for the Study of African Economies, University of Oxford.

CRFB. (2013, August 27). *The Tax Break-Down: Preferential Rates on Capital Gains*. Retrieved from Committee for a Responsible Federal Budget: http://www.crfb.org/blogs/tax-break-down-preferential-rates-capital-gains

Daveri, F. (2018, October 1). Governments [Powerpoint-slides]. Milan, Italy.

Day, J. C., & Newburger, E. C. (2002). *The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings. Special Studies. Current Population Reports.* (P23-210). Washington, DC: Bureau of the Census (DOC), Economics and Statistics Administration.

Delhey, J., & Newton, K. (2003). Who Trusts? The Origins of Social Trust in Seven Societies. European Societies, 5(2), 93-137.

Deng, W.-S., Lin, Y.-C., & Gong, J. (2012). A smooth coefficient quantile regression approach to the social capital–economic growth nexus. Economic Modelling, 29(2), 185-197.

Di Tella, R., MacCulloch, R. J., & Oswald, A. J. (2003). THE MACROECONOMICS OF HAPPINESS. *The Review of Economics and Statistics, 85*(4), 809-827.

Dinesen, & Thisted, P. (2013). Where You Come From or Where You Live? Examining the Cultural and Institutional Explanation of Generalized Trust Using Migration as a Natural Experiment. European Sociological Review, 29(1), 114-128.

Dix-Carneiro, R., & Kovak, B. K. (2015). *Trade Reform and Regional Dynamics: Evidence From 25 Years of Brazilian Matched Employer-Employee Data.* (NBER Working Paper No. 20908). Cambridge: National Bureau of Economic Research. Retrieved from https://www.nber.org/papers/w20908.pdf

Dix-Carneiro, R., Soares, R. R., & Ulysse, G. (2017). *Economic Shocks and Crime: Evidence from the Brazilian Trade Liberalization.* (NBER Working Paper No. 23400). Cambridge: NATIONAL BUREAU OF ECONOMIC RESEARCH. Retrieved from https://www.nber.org/papers/w23400.pdf

Economic problems and socioeconomic beliefs and attitudes. (1988). *Research in Social Stratification and Mobility, 7*, 273-302.

Eek, D., & Rothstein, B. (2006). Political Corruption and Social Trust - An Experimental Approach. QOG WORKING PAPER SERIES.

Eurofund. (2012). *Third European Quality of Life Survey - Quality of life in Europe: Impacts of the crisis.* Luxembourg: Publications Office of the European Union. doi:10.2806/42471

Fajnzylber, P., Lederman, D., & Loayza, N. (2002). INEQUALITY AND VIOLENT CRIME. *Journal of Law and Economics, 45*(1), 1-40.

Fazel, S., Wolf, A., Chang, Z., & Larsson, H. (2015). Depression and violence: A Swedish population study. *The Lancet Psychiatry, 2*(3), 224-232. doi:10.1016/S2215-0366(14)00128-X

Fehr, E., & Goette, L. (2005). Robustness and real consequences of nominal wage rigidity. *Journal of Monetary Economics, 52*(4), 779-804. doi:10.1016/j.jmoneco.2005.03.006

Fisman, R., & Miguel, E. (2010). Economic Gangsters: Corruption, Violence, and the Poverty of Nations. Princeton: Princeton University Press.

Fougére, D., Kramarz, F., & Pouget, J. (2010). YOUTH UNEMPLOYMENT AND CRIME IN FRANCE. *Journal of the European Economic Association, 7*(5), 909-938. doi:10.1162/JEEA.2009.7.5.909

Fraile, M., & Fons, M. F. (2005). Explaining the Determinants of Public Support for Cuts in Unemployment Benefits Spending across OECD Countries. *International Sociology, 20*(4), 459-481. doi:10.1177/0268580905058327

Freitag, M., & Buhlmann, M. (2005). Political Institutions and the Formation of Social Trust. An International Comparison. Politische Vierteljahresschrift, 46(4), 575–586.

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

Galbraith, J. (1997). The Great Clash 1929. New York: Mariner Books, Houghton Mifflin Company.

George, D., & Mallery, P. (2011). SPSS for Windows Step by Step, A Simple Guide and Reference 18.0 Update. Boston: Pearson Education.

Gili, M., Roca, M., Basu, S., McKee, M., & Stuckler, D. (2013). The mental health risks of economic crisis in Spain: evidence from primary care centres, 2006 and 2010. *European Journal of Public Health, 23*(1), 103-108. doi:10.1093/eurpub/cks035

Glass, G. V., Peckham, P. D., & Sanders, J. R. (1972). Consequences of failure to meet assumptions underlying fixed effects analyses of variance and covariance. Review of Educational Research, 42, 237-288.

Graeff, P., & Svendsen, G. T. (2013). Trust and corruption: The influence of positive and negative social capital on the economic development in the European Union. Quality & Quantity: International Journal of Methodology, 47(5), 2829-2846.

Guerrero, M. A., & Rodriguez-Oreggia, E. (2008). On the individual decisions to commit corruption: A methodological complement. *Journal of Economic Behavior & Organization, 65*(2), 357-372. doi:10.1016/j.jebo.2005.09.006

Hariri, J. G., Bjørnskov, C., & Justesen, M. K. (2016). Economic Shocks and Subjective Well-Being: Evidence from a Quasi-Experiment. *The World Bank Economic Review, 30*(1), 55-77. doi:https://doi.org/10.1093/wber/lhv004

Harwell, M. R., Rubinstein, E. N., Hayes, W. S., & Olds, C. C. (1992). Summarizing Monte Carlo Results in Methodological Research: The One- and Two-Factor Fixed Effects ANOVA Cases. Journal of Educational Statistics, 17(4), 315-339.

Heckman, J. J. (2011). The Economics of Inequality: The Value of Early Childhood Education. *American Educator, 35*(1), 31-35.

Hooghe, M., & Stolle, D. (2003). Generating Social Capital: Civil Society and Institutions in a Comparative Perspective. New York: Palgrave/Macmillan.

Hooper, D., & Mullen, M. R. (2008). Structural Equation Modelling: Guidelines for Determining. Electronic Journal of Business Research Methods, 6(1), 53-60.

Hunt, J. (2007). How corruption hits people when they are down. *Journal of Development Economics, 84*(2), 574-589. doi:10.1016/j.jdeveco.2007.02.003

Hunt, J., & Laszlo, S. (2012). Is Bribery Really Regressive? Bribery's Costs, Benefits, and Mechanisms. *World Development, 40*(2), 355-372. doi:10.1016/j.worlddev.2011.06.001

IMF . (2019, May 18). *About the IMF*. Retrieved from International Monetary Fund: https://www.imf.org/en/About.

Ivlevs, A., & Hinks, T. (2015). Global economic crisis and corruption. *Public Choice, 162*(3-4), 425-445. doi:https://doi.org/10.1007/s11127-014-0213-z

Jeene, M., van Oorschot, W., & Uunk, W. (2014). The dynamics of welfare opinions in changing economic, institutional and political contexts: An empirical analysis of dutch deservingness opinions, 1975-2006. *Social Indicators Research, 115*(2), 731-749. doi:https://doi.org/10.1007/s11205-012-0230-6

Jones, B. R. (2001). *Routledge Encyclopedia of International Political Economy* (Vol. 1). London: Routledge.

Jorgenson, D. (1991). Productivity and economic growth. In R. Ernst, & J. Triplett, Fifty Years of Economic Measurement: The Jubilee of the Conference on Research in Income and Wealth (pp. 19-118). Chicago: University of Chicago Press.

Judd, C., & Kenny, D. (1981). Process Analysis: Estimating Mediation in Treatment Evaluations. Evaluation Review, 5(5), 602-619.

Kahn, S. (1997). Evidence of nominal wage stickiness from microdata. *American Economic Review, 87*(5), 993-1008.

Katikireddi, S. V., Niedzwiedz, C. L., & Popham, F. (2008). *Trends in population mental health before and after the 2008 recession: a repeat cross-sectional analysis of the 1991–2010 Health Surveys of England.* BMJ Open 2012;e001790. doi:10.1136/bmjopen-2012-001790

Knack, P. J., & Stephen, Z. (2001). Trust and Growth. The Economic Journal, 111(470), 295-321.

Kolstad, I., & Wiig, A. (2011). Natural resources, corruption and trust: A complex relationship. Chr. Michelsen Institute. Retrieved from https://www.cmi.no/publications/4316-natural-resources-corruption-and-trust

Kovak, B. K. (2013). Regional effects of trade reform: What is the correct measure of liberalization? *American Economic Review, 103*(5), 1960-1976. doi:http://dx.doi.org/10.1257/aer.103.5.1960

Kumlin, S., & Rothstein, B. (2005). Making and Breaking Social Capital: The Impact of Welfare-State Institutions. Comparative Political Studies, 38(4), 339-365.

Laeven , L., & Valencia, F. (2013). Systemic Banking Crises Database. *IMF Economic Review, 61*(2), 225-270. doi:https://doi.org/10.1057/imfer.2013.12

Laeven, L., & Valencia, F. (2018). *Systemic Banking Crises Revisited.* (IMF Working Paper No. 18/206). International Monetary Fund.

Lambsdorff, J. G. (2015). Preventing Corruption by Promoting Trust – Insights from Behavioral Science. Passauer Diskussionspapiere, Volkswirtschaftliche Reihe, 69(15).

Lambsdorff, J. G., Taube, M., & Schramm, M. (2005). The New Institutional Economics of Corruption. London: Routledge.

Leschke, J., & Jepsen, M. (2012). Introduction: Crisis, policy responses and widening inequalities in the EU. *International Labour Review, 151*(4), 289-312. doi:10.1111/j.1564-913X.2012.00150.x

Leung, Ambrose, Kier, C., Fung, T., Fung, L., & Sproule, R. (2011). Searching for Happiness: The Importance of Social Capital. Journal of Happiness Studies, 12(3), 443-462.

Lin, M.-J. (2008). Does unemployment increase crime? Evidence from U.S. data 1974-2000. *Journal of Human Resources, 43*(2), 413-436.

Lix, L. M., Keselman, J. C., & Keselman, H. J. (1996). Consequences of Assumption Violations Revisited: A Quantitative Review of Alternatives to the One-Way Analysis of Variance "F" Test. Review of Educational Research, 66(4), 579-619.

Longman. (2019, February 25). Retrieved from Longman Dictionary of Contemporary English: https://www.ldoceonline.com/dictionary/corruption

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58*, 593-614. doi:10.1146/annurev.psych.58.110405.085542

Mertens, A., & Beblo, M. (2016). Self-reported satisfaction and the economic crisis of 2007–2010: Or How People in the UK and Germany perceive a severe cyclical downturn. *Social Indicators Research, 125*(2), 537-565. doi:https://doi.org/10.1007/s11205-014-0854-9

Mirowsky, J., & Ross, C. E. (2005). Education, cumulative advantage, and health. *Ageing International, 30*(1), 27-62. doi:10.1007/BF02681006

Mocan, N. (2008). What determines corruption? International evidence from micro data. *Economic Inquiry, 46*(4), 493-510. doi:https://doi.org/10.1111/j.1465-7295.2007.00107.x

Montagnoli, A., & Moro, M. (n.d.). *Everybody Hurts: Banking Crises and Individual Wellbeing.* (SERPS no. 2014010). Sheffield: The University Of Sheffield, Department of Economics.

Nasdaq. (2019, March 13). *Economic shock*. Retrieved from Nasdaq: https://www.nasdaq.com/investing/glossary/e/economic-shock

Naumann, E., Buss, C., & Bähr, J. (2016). How unemployment experience affects support for the welfare state: A real panel approach. *European Sociological Review, 32*(1), 81-92. doi:10.1093/esr/jcv094

NBER. (2019, March 12). *US Business Cycle Expansions and Contractions*. Retrieved from National Bureau of Economic Research: https://nber.org/cycles.html

Neumark, D., & Wascher, W. (2000). *Using the EITC to help poor families: New evidence and a comparison with the minimum wage.* (NBER Working Paper 7599). Cambridge: NATIONAL BUREAU OF ECONOMIC RESEARCH . Retrieved from https://www.nber.org/papers/w7599.pdf

Neumark, D., & Wascher, W. (2007). Do Minimum Wages Fight Poverty? *Economic Inquiry, 40*(3), 315-333. doi:https://doi.org/10.1093/ei/40.3.315

Newsom, J. T. (2018). Testing Mediation with Regression Analysis. Retrieved from Structural Equation Modelling: http://web.pdx.edu/~newsomj/semclass/

OECD. (2019). *Society at a Glance 2019: OECD Social Indicators.* Paris: OECD Publishing. doi:https://doi.org/10.1787/soc_glance-2019-en

Ostrom, E., & Ahn, T. (2009). The meaning of social capital and its link to collective action. In G. Svendsen, & G. Svendsen, Handbook of Social Capital. The Troika of Sociology, Political Science and Economics (pp. 17-35). Cheltenham: Edward Elgar.

Özcan, B., & Bjørnskov, C. (2011). Social trust and human development. Journal of Behavioral and Experimental Economics (formerly The Journal of Socio-Economics), 40(6), 753-762.

Pevalin, D., & Robson, K. (2009). *The Stata Survival Manual.* Berkshire: Open University Press.

Raphael, S., & Winter-Ebmer, R. (2001). Identifying the Effect of Unemployment on Crime. *Journal of Law and Economics, 44*(1), 259-283. doi:https://doi.org/10.1086/320275

Reeskens, T., & van Oorschot, W. (2014). European feelings of deprivation amidst the financial crisis: Effects of welfare state effort and informal social relations. *Acta Sociologica, 57*(3), 191-206. doi:https://doi.org/10.1177/0001699313504231

Reinhart, C. M. (2019). Data. Retrieved from Carmen M Reinhart: http://www.carmenreinhart.com/data/

Reinhart, C. M. (2019). Short Bio. Retrieved from Carmen M. Reinhart: http://www.carmenreinhart.com/

Reinhart, C. M., & Rogoff, K. S. (2009). *This time is different: eight centuries of financial folly.* Princeton, N.J: Princeton University Press.

Richey, S. (2010). The Impact of Corruption on Social Trust. American Politics Research, 38(4), 676-690.

Robinson, J., Torvik, R., & Verdier, T. (2006). The Political Foundations of the Resource Curse. Journal of Development Economics, 79, 447-468.

Roine, J., & Waldenstörm, D. (2012). On The Role Of Capital Gains In Swedish Income Inequality. *Review of Income and Wealth, 58*(3), 569-587. doi:https://doi.org/10.1111/j.1475-4991.2011.00475.x

Roth, F., Nowak-Lehmann, F. D., & Otter, T. (2011). *Has the financial crisis shattered citizens' trust in national and European governmental institutions? Evidence from the EU member states, 1999-2010.* (CEPS Papers 4159). Centre for European Policy Studies.

Rothstein, B. (2005). All for All: Equality, Corruption, and Social Trust. World Politics, 58, 41-72.

Rothstein, B. (2013). Corruption and Social Trust: Why the Fish Rots from the Head Down. social research.

Rueda, D. (2012). West European Welfare States in Times of Crisis. In N. G. Bermeo, & J. Pontusson, *Coping with crisis : government reactions to the great recession* (pp. 361-409). New York: Russell Sage Foundation.

Sabia, J. J., & Burkhauser, R. (2010). Minimum Wages and Poverty: Will a $9.50 Federal Minimum Wage Really Help the Working Poor? *Southern Economic Journal, 76*(3), 592-623. doi:10.2307/27751487

Sabia, J. J., & Nielsen, R. B. (2013). Minimum wages, poverty, and material hardship: new evidence from the SIPP. *Review of Economics of the Household, 13*(1), 95-134. doi:https://doi.org/10.1007/s11150-012-9171-8

Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research methods for business students.* Harlow: Pearson.

Scruggs, L., & Allan, J. P. (2006). Welfare state decommodification in 18 OECD countries: A replication and revision. *Journal of European Social Policy, 16*(1), 55-72. doi:https://doi.org/10.1177/0958928706059833

Sobotka, T., Skirbekk, V., & Philipov , D. (2011). Economic Recession and Fertility in the Developed World. *Population and Development Review, 37*(2), 267-306. doi:https://doi.org/10.1111/j.1728-4457.2011.00411.x

Søreide, T. (2016). Corruption and Criminal Justice: Bridging Economic and Legal Perspectives. Edward Elgar Publishing.

Soss, J. (2001). Unwanted Claims: The Politics of Participation in the U.S. Welfare System. Social Service Review, 75(4), 691-693.

Starke, P., Kaasch, A., & van Hooren, F. (2011). *Explaining the variety of social policy responses to economic crisis: How parties and welfare state structures interact.* (TranState working papers 154). University of Bremen: Collaborative Research Center 597.

Starke, P., Kaasch, A., & van Hooren, F. (2013). *The welfare state as crisis manager: Explaining the diversity of policy responses to economic crisis.* London: Palgrave Macmillan.

Stolle, D. (2003). Generating Social Capital: Civil Society and Institutions in a Comparative Perspective. New York: Palgrave/Macmillan.

Sun, W., & Wang, X. (2012). Do government actions affect social trust? Cross-city evidence in China. The Social Science Journal, 49, 447–457.

Svensson, H. M., Albæk, E., van Dalen, A., & de Vreese, C. H. (2016). The impact of ambiguous economic news on uncertainty and consumer confidence. *European Journal of communication, 32*(2), 85-99. doi:https://doi.org/10.1177/0267323116677205

Taylor, P., Funk, C., & Clark, A. (2007). Americans and Social Trust: Who, Where and Why. Retrieved from http://www.pewresearch.org/wp-content/uploads/sites/3/2010/10/SocialTrust.pdf

Tella, R. D., & MacCulloch, R. (2009). Why Doesn't Capitalism Flow to Poor Countries? Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution, 40(1), 285-332.

The Quality of Government Institute. (2019). The QoG Institute. Retrieved 2019, from Data: https://qog.pol.gu.se/data/datadownloads

The University of Texas at Austin. (2015). Degrees of Freedom. Retrieved from Statistics Online Support:
https://sites.utexas.edu/sos/degreesfreedom/

Thomas, V., Wang, Y., & Fan, X. (2001). *Measuring Education Inequality: Gini Coefficients of Education (English).* (Policy, Research working paper:no. WPS 2525). Washington, DC: World Bank. Retrieved from http://documents.worldbank.org/curated/en/361761468761690314/Measuring-education-inequality-Gini-coefficients-of-education

Tonkiss, F. (2009). Trust, confidence and economic crisis. *Intereconomics, 44*(4), 196-202. doi:https://doi.org/10.1007/s10272-009-0295-x

Univeristy of Gothenburg. (2017, April 19). Bo Rothstein. Retrieved from Univeristy of Gothenburg: https://www.gu.se/english/about_the_university/staff/?languageId=100001&userId=xrotbo

USA Central Intelligence Agency. (2019). The World Factbook. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/docs/history.html

Uslaner, E. (2002). The moral foundations of trust. New York: Cambridge University Press.

Uslaner, E. (2012). Trust and corruption revisited: how and why trust and corruption shape each other. Springer Science.

Uslaner, E. M. (2010). Trust and the Economic Crisis of 2008. *Corporate Reputation Review, 13*(2), 110-123. doi:https://doi.org/10.1057/crr.2010.8

van Dalen, A., de Vreese, C. H., & Albæk, E. (2017). Mediated uncertainty: The negative impact of uncertainty in economic news on consumer confidence. *Public Opinion Quarterly, 81*(1), 111-130. doi:https://doi.org/10.1093/poq/nfw039

van Hooren, F., Starke, P., & Kaasch, A. (2014). The shock routine: economic crisis and the nature of social policy responses. *Journal of European Public Policy, 21*(4), 605-623. doi:10.1080/13501763.2014.887757

Wooldridge, J. M. (2016). Introductory Econometrics : a Modern Approach. Mason, OH, United States: Cengage Learning, Inc.

World Bank. (2019). Who we are. Retrieved from World Bank: https://www.worldbank.org/en/who-we-are

World Bank. (2019). World Bank Data. Retrieved from https://data.worldbank.org/about

Wu, X., Perloff, J. M., & Golan, A. (2002). *Effects of government policies on income distribution and welfare.* (IRLE WORKING PAPER #86-02). Berkeley: University of California Berkeley, Institute for Research on Labor and Employment.

Xianghong, W. (2009). Retail Return Policy, Endowment Effect, and Consumption Propensity: An Experimental Study. The B.E. Journal of Economic Analysis & Policy, 9(1), 1-29.

Zhang, W. (2003). Enterprisers and professional handlers: How to establish trust. Journal of Peking University (Philosophy and Social Sciences), 40(5), 29-39.

Appendix

Regression table for social trust and corruption in non-crisis time

	(1) Social trust
Bayesian corruption index	0,733* (2,13)
Gini	-1,315** (-3,09)
HDI	52,31 (0,73)
_cons	14,83 (0,21)
N	166
R² within	0,118
R² overall	0,0969
R² between	0,00672
Fixed effect	Yes
Prob > F	0,0000
Prob > chi²	

t statistics in parentheses
* $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$

Table 12: Regression table between social trust and corruption during non-crisis periods. P-value is significant with 0,05.

Mechanisms behind the regressions

Our regression analysis method is proposed by Baron and Kenny (1986). They suggested a four-step approach when testing for mediation, in which several regression analyses are conducted, and significance of the coefficients is inspected at each step. We advised to use the diagram below to follow the explanation of the method (*h* is a direct effect). The explanation and diagram below are produced by Dr. Jason Newsom (2018).
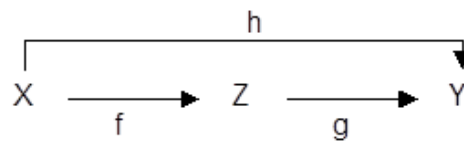

Figure 13: Example of test for mediation

	Analysis	Visual Depiction
Step 1	Conduct a simple regression analysis with X predicting Y to test for path *h* alone, $Y = B_0 + B_1X + e$	
Step 2	Conduct a simple regression analysis with X predicting Z to test for path *f*, $Z = B_0 + B_1X + e$.	
Step 3	Conduct a simple regression analysis with Z predicting Y to test the significance of path *g* alone, $Y = B_0 + B_1Z + e$.	
Step 4	Conduct a multiple regression analysis with X and Z predicting Y, $Y = B_0 + B_1X + B_2Z + e$	

Table 13: The four regression steps when testing for mediation.

From step 1 to step 3, the purpose is to confirm the relationships among the variables. If one or more of these relationships are nonsignificant, we usually conclude that mediation is not possible. If there are significant relationships from Steps 1 through 3, we will proceed to step 4. In the Step 4 model, some form of mediation is established if the effect of Z (path g) remains significant after controlling for X. If X is not significant when Z is controlled, the finding supports full mediation. The finding supports partial mediation, if X is still significant.

Macroeconomic explanation of GDP growth, debt and inflation

The arithmetic of debts and deficits:

A simple formula allows us to track changes of the ratio debt/GDP (*d*) over time.

$$d_{t+1} - d_t = (def)_{t+1} - (p_{t+1} + g_{t+1}) \cdot d_t$$

Also written as:

$$d_{t+1} - d_t = (i_{t+1} - p_{t+1} - g_{t+1}) \cdot d_t + (primary\ def)_{t+1}$$

Where, d = public debt/GDP (indicator that makes is possible to compare across countries), i = average nominal interest rate on government bonds, p = inflation rate (growth rate of GDP deflator), g = growth rate of real GDP, primary def = $G + I^g + Tr - T$/GDP, G = Government purchases of goods and services, I^g = public investment, Tr = transfers (pensions, assistance to the poor and the unemployed, subsidies to firms), T = indirect taxes (e.g. VAT) + direct taxes (personal & corporate taxes) + social security contributions.

Implications of increasing budget deficits for debt accumulation (Daveri, 2018)**:**

1) Low inflation and GDP growth may increase debt even with declining deficits. For example, data for Germany indicates that zero inflation ($p = 0\%$) and low growth ($g = -5\%$), debt accumulates fast.

2) Higher deficits may reduce the debt/GDP-ratio if they result in higher GDP growth.

3) There may be snowball effect. Debt may go up even with low "primary def" if "i" is high and/or "p" and "g" are low enough. Running a budget surplus may not be enough during a "confidence crisis", when "i" is very high". An example on confidence crisis is selling d in a country leads to a decrease in p_{debt} and an increase i_{debt}. If interest rate goes up, the government spending goes up. In other words, increase in iD_i (interest payments on outstanding debt) leads to an increase in government spending, which increases DEF and increase d.