A Study of the Impact of Social Trust on Economic Growth and Defining a Potential Threshold for 'High Trust' in Economic Research

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While writing this thesis, I have not witnessed any wrongdoing, nor have I personally violated any conditions of the Skidmore College Honor Code.

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Abstract

This paper seeks to 1. evaluate findings from previous literature that demonstrated evidence of social trust having a positive relationship with economic growth in the form of Gross Domestic Product per capita (GDPpc) and 2. evaluate potential trust levels that can be used as a threshold for considering a country 'high-trusting' when conducting economic research. The study gathered data to measure social trust levels from World Values Survey where respondents answered yest to the question "most people can be trusted". Then the study evaluated the relationship between trust and GDPpc with control variables including technology, education, labor, investment, and external balance (variables used found from World Development Indicators within World Bank data and described later). The study also ran regressions using two thresholds for high trust, one at 40% and another at 60%. This was done using dummy variables highTrust 40 and highTrust60. The results from the data demonstrate a positive relationship between social trust and GDPpc growth . There was also a demonstrated difference when passing the threshold of 40% trust but there is more research needed to determine the usefulnes of these findings.

Introduction

Most studies in the literature examine the relationship between social trust and economic growth . There is a sufficient amount of existing literature demonstrating that countries with higher levels of social trust exhibit stronger economic growth than countries with lower levels of social trust (Bjørnskov. 2017, Cui. 2017). There is also a degree of new literature examining the mechanisms that allow social trust to contribute to economic growth in the form of GDP per capita. To contribute to the existing literature, my paper evaluates [previous literature while taking a threshold for defining countries as 'high-trust' vs 'low-trust' and comparing how the impact of being a 'high-trust' country on growth]. While there is economic literature that examines the effect of economic recession on trust levels, there is much research detailing a threshold of trust that makes a 'high-trust' country as compared to a 'low trust country'. The existing literature either focuses on demonstrating the relationship between trust and economic growth or examining the effect of economic adversity on trust. My research will evaluate past literature while also directly comparing these high-trust countries to low-trust countries.

Trust is a social factor and may not be one that policy makers are taking into account when planning political or economic plans. However, previous literature demonstrates that trust is linked to both political stablilty (Pitlik & Rode. 2021) as well as economic performance (Bjørnskov 2017, 2022; Cui 2017; Knack & Keefer. 1997). There are even indications that higher levels of social trust can help guide countries through pandemics such as COVID-19 (Lenton. 2021). Given this, it is in the best interest of policy makers to be acting in ways that induce higher levels of trust from given societies. This returns benefits as it allows for more seamless legislation, lowers transaction cost, and allows for higher investment into private and public expenditure for greater society (Bjørnskov 2017).

Social trust has emerged as a significant factor influencing political and economic dynamics, particularly its impact on economic growth. This paper takes focus of literature aimed at exploring the relationship between social trust and GDP growth. To better understand determinants of social trust, Delhey (2003) identified factors such as perceptions of social conflict, informal social networks, and economic success as key influencers. This is used in tandem with other studies regarding social trust, notably Knack and Keefer's seminal work in 1997, which discussed the importance of trust in economic performance by focusing on adverse

effects of declining trust rates on economic growth, particularly in the United States. Moreover, research by Beugelsdijk et al. (2004) reinforced the notion that trust matters significantly in explaining variation in economic performance.

Contrasting some of the early trust to economic growth relationship, Roth (2007) challenged assumptions about the continuous positive relationship between trust and economic growth, introducing nuances to the discourse. Despite such debates, Bjørnskov's research in 2009 and 2012 established a robust connection between trust, education, institutions, and economic growth. In 2017, Bjørnskov outlined a theoretical framework that elucidated both direct and indirect pathways through which trust influences GDP growth. This theoretical groundwork laid the foundation for empirical studies. However, as the literature evolved, questions arose regarding the mechanisms underlying the trust-growth relationship and the role of institutions. Cui's research in 2017 emphazized the intrinsic relationship between trust and formal institutions, emphasizing their joint impact on economic growth, particularly in the context of China. Furthermore, scholars like Bodoh-Creed (2019) and Habibov (2018) explored how institutions could foster trust and enhance economic performance, shedding light on the reciprocal nature of this relationship. Pitlik and Rode (2021) found that social trust is associated with moderate attitudes towards government intervention during economic crises, suggesting its importance in fostering resilience. Meanwhile, studies by Tormos (2019) and Graziani et al. (2023) revealed how personal economic turmoil and trust in institutions influence political trust and coping strategies during crises like the Great Recession and the COVID-19 pandemic. Lenton's research (2021) introduced a novel perspective by correlating COVID-19 resilience with trust levels, demonstrating the potential for high-trust countries to effectively respond to crises. However, while Lenton's findings are novel, a gaps remain in understanding economic resilience in terms of COVID-19. In light of these insights, this paper aims to evaluate studies that demonstrate a relationship between trust and GDP growth to add to the evidence base. In addition, this paper will attempt to define a theshold that can be used to compare countries on a bases of 'high or low' trust. By delving into these nuances, we seek to enhance our understanding of how trust shapes economic outcomes and inform policy interventions aimed at boosting economic performance in terms of GDPpc.

In evaluating the results of this paper. Findings support previous literature in that there is a positive relationship between trust and GDPpc growth. This means that this paper will

contribute further to evidence of the relationship established by Knack and Keefer (1997) and continued by Bjørnskov, Cui and others. However, this paper was unsuccessful in determining a optimal threshold for high trusting countries. This is due to a lack of differentiation between measuring trust with a threshold or as a continuous variable. This would be more easily defined if there was more data with thresholds above 40% of respondents saying yes to WVS question "most people can be trust".

Literature Review

Initial Research

To begin the initial research phase this paper focuses first on social trust as a political and economic factor. Delhey (2003) examines six potential determinants of social trust. She tested them using data from 1999-2001. Three of the theories presented show effect. 1. Social trust is higher among people who believe there is less social conflict and feel safe. 2. Informal social networks are associated with trust. 3. More success is associated with higher social trust. This paper will focus on World Value Survey data collected on the percentage of respondents answering "most people can be trusted" when asked about trust. This will be described in more detail in methods. In reviewing previous literature, Knack Phillip Keefer (1997)is one of the primary papers to return social trust to the literature in economics entering the 2000s. In examining 'social capital' - including social trust and civic cooperation - the research concludes that there are adverse effects to economic growth in the United States given declining trust rates. The study also found the positive relationship between trust and economic growth was more pronounced in poorer countries. This may be in part explained by the additional finding that interpersonal trust is more important in determining economic growth when formal institutions are weaker. Lastly, the study found correlation between social trust and increase in the number of people achieving secondary education. This paper is large in laying the groundwork for future models relating trust to economic activity (Knack & Keefer. 1997). Beugelsdijk et al. (2004) perform a study to analyze the robustness of the results of Knack and Keefer (1997) in which they conclude " their extensive robustness analysis further adds to the empirical evidence that trust matters for explaining variation in economic performance" (Beugelsdijk et al. 2004). This solidifies Knack and Keefers work as the model for future research. Roth (2007)

challenged some of the findings of Knack and Keefer by questioning the assumption of a continuous positive relationship between trust and economic growth. In testing EU and OECD countries, Roth concludes that increase in economic growth is negatively correlated to trust (Roth. 2007). Roth works with trust within a paradigm of social capital. He uses a cross-section research design to examine the relationship between social capital and economic growth. The research conducted by Roth brings into question the concept of diminished returns to trust as economies grow. While Roth's findings demonstrate a negative effect on trust as a function of economic growth, this does not establish a negative effect on economic growth as a function of trust, which other literature as well as this paper seek to study. Following Roth (2007), there is a large amount of existing research to substantiate Knack and Keefer's work describing a positive relationship with GDP growth as a function of trust. Much of the research in the existing literature has been compiled by Christian Bjørnskov's work. Bjørnskov (2009) examines the relationship of social trust effects on the growth of schooling. To do this, Bjørnskov focuses on whether social trust lowers transaction costs associated with the employment of educated individuals. The study is conducted over 52 countries and focuses on the time period between 1960-2000. Empirical research and real-life data point toward a positive relationship between increase in social trust and education in countries). Bjørnskov followed up this line of research in 2012 using 3 SLS methodology to find a positive relationship between social trust and economic growth through two main pathways: improved education and more efficient institutions. The trust-education relationship that contributes to economic growth is actually part of a cycle including investment, trust, and growth. Countries that are looking to invest in more knowledge-based production including expanding technology or infrastructure turn to a more educated populus. This leads to an investment into education. In higher trusting countries, the investment in education is more intense as a result of a relatively lower cost in hiring educated personnel. This leads to more efficient production increasing the ability to reinvest, creating a cycle. (Bjørnskov. 2009, 2012). The initial connections of trust having a positive relationship with economic growth in terms of GDP paired with Bjørnskov's findings of trust being indirectly associated with GDP through indirect methods such as education or institutions creates a bases where there is a visible relationship trust and GDP that leads this paper to look for research that establishes significant relationships between trust .

Establishing Trust/Growth Model and Further Research

At this point, the existing literature has established that there *is* a relationship between trust and economic progress but the nature of that relationship is still somewhat in question. There is proof of higher levels of trust having a positive impact on education and institutions. To clarify what is included in the examination of 'institutions', Douglas North is one of the original authors to introduce institutions as an economic impactor. North describes institutions as "humanly devised constraints that structure political, economic, and social interaction" (North 1990). The role of institutions is to set and lower transaction cost by constraining the actions of "players" in an economic or social game. North demonstrates the need for sound institutions in order to foster trade because as the size of society grows, establishing cooperation becomes more difficult without enforcement. North describes both formal institutions (property rights, tax collection, law enforcement) and informal institutions (religion, norms, shared moral values) that help constrain people in a way that makes cooperation possible for policy and economic decision making. This also allows for specialization within growing economies. While there is strong reason to believe that due to improvement in education and institutions would naturally improve economic function, it is not until around 2017 that we see models and research proving Knack and Keefers original findings about trust and economic growth.

Extending from his research in 2012, Bjørnskov (2017) details a brief history of the introduction for a strong association between trust and economic growth. Bjørnskov creates a strong theoretical model outlining both the direct and the indirect relationship that social trust has GDP growth. For a visual, this model will be included at the end of the paper as 'Referenced Model 1'. First breaking down the indirect model, social trust has one indirect connection with GDP growth through the impact on institutional frameworks. GDP impactors through strengthened institution frameworks include lower regulations allowing more efficient transactions, lowered cost of enforcing said regulation or litigation, more willingness to invest in institutions, and more efficient public private bureaucracies due to the ability to trust that the general public will adhere to them. Next, Bjørnskov continues with the direct and indirect impact of economic growth but through education, investments, and productivity innovation. Social trust impacts these three factors both directly and indirectly due to a cycle of impacts from the others, which Bjørnskov details with small arrows connecting the three boxes. Essentially, all three of these factors impact economic growth in terms of GDP. They also affect each other. If there is productivity innovation that requires investment and

education, social trust has a strong role in determining the efficiency of those transactions. For example, higher trusting countries would be more willing to invest in education and innovation, leading to more production and a higher capacity for future education. This creates a cycle of direct and indirect effects that lead to higher GDP growth as a result of higher trust levels. In terms of empirical evidence, Bjørnskov effectively proves a positive relationship between trust and GDP growth with significant results backing the indications of his theoretical model. (Bjørnskov 2017). Where there is room for growth in the literature at this point is expanding detail into the mechanisms from the theoretical model regarding if certain factors are the primary connectors of trust and GDP growth and determining the causality problem of seeing if there is a causal relationship between trust and growth of of the effects exist exclusively in an indirect context. Cui (2017) similarly examines institutions described by North to the equation of the social trust effect on economic growth. Her research claims social trust and formal institutions are intrinsically and necessarily related to one another. In this, Cui social trust as an informal institution. Cui aims to investigate how trust and institutions relate when considering economic growth. Cui examines social trust and formal institutions in 2001-2009 China. The estimates from the study indicate that both increase in social trust and improvement in formal institutions lead to economic growth. The study also finds a negative relationship between the magnitude of the effect from social trust and stronger institutions (i.e. stronger institutions → increase in social trust has lower impact) (Cui. 2017). The results gathered here are intuitive in that there are diminished returns as institutions get stronger there is inherently going to be a lower reliance on trust. Cui could expand research into evaluating what the threshold is for where trust makes the most impact and when its impacts begin to decrease as institutions get stronger.   Aaron L. Bodoh-Creed explores the inverse question to Cui, asking how institutions can help build trust in markets. The study examines private market contracts as well as government contracts and shows that more sound institutions can improve trust. The improved trust leads to lower transaction cost and therefore economic growth. In this sense it is good to expand public order institutions but the study shows if spread too far that these institutions can collapse. (Bodoh-Creed. 2019). Auchynnikava N. Habibov in his study "Who wants to pay more taxes to improve public health care?" examines trust and willingness to pay taxes to support the welfare state. Instrumental variable analysis demonstrates causal relationships between institutional trust and welfare state support. The results of the study showed one unit increase in institutional trust lead to a 15% increase in welfare state support and a 16% increase in willingness to pay taxes). This reflects that trust helps government institutions function more efficiently. Assuming the trust is

not misguided, this should lead to economic growth (Habibov. 2018). These results line up with Bjørnskov (2017) in that they look into ways that social trust can be a factor in lowering transaction cost. Higher trusting populations can both increase the rate and make the process of tax collection more efficient. These papers do a good job in showing that increased trust has a positive effect on willingness to pay taxes but there could be more done in creating some operational standards for trust and willingness to pay. For example, at what level of trust, by level this paper refers to a quantified standard based on World Value Survey (WVS) data, creates the most significant change in willingness to pay. Is there an amount of trust that could have the opposite effect in any way? Getting more specific into what are the optimal levels of trust will be one of the goals of this paper. Now that there is an established relationship between social trust and economic growth. My focus on literature turns to learning more about the mechanisms that allow trust to increase economic growth. Bjørnskov (2022) focuses on the determinants of growth that result from improved social trust. The paper focuses on trust effects on the rate of factor accumulation compared to productivity improvements (based on Solow's residual to determine how much production a society is gaining out of their factors of accumulation such as land labor capital…). Measuring 64 countries from years 1977-2017 results show trust predominantly affects long run growth by affecting growth in productivity as opposed to developing formal institutions (Bjørnskov. 2022). This paper operates in contrast with a portion of the existing literature that focuses on institutions as a method for trust improving economies. In this research I had learned that there is more than enough research to demonstrate a positive relationship between trust and economic growth. As the research window for mechanisms began to close, I began to have some repetitive questions. What if the economy is not growing but rather facing hardship? How does trust impact a country's response to economic shock?

Trust and Hardship

While researching mechanisms for which social trust can help foster economic growth, I found a study that looks into the ability for trust to temper political polarization and fragmentation. Pitlik & Rode (2021) focuses on individual data collected from the World Values Survey and the European Values Study. Their sample includes 190,000 respondents spread across 68 democratic countries. The results found that social trust is associated with temporated attitudes in whether the government should intervene or redistribute economic resources. According to the authors, their results complement ideas in socio-psychological research that "trusting people have personality attributes which work towards a moderation on politically divisive topics'. This research opens the possibility that trusting societies may be superior in adapting policies to novel challenges due to less political

polarization (Pitlik, H., & Rode, M. 2021). This paper deepened the behavior aspect that could be evaluated when considering a country's ability to handle an economic crisis. Countries that would, when subject to economic instability, resort to political fragmentation may be less equipped to handle crisis level situations. This led my research to the question of COVID-19 and how some countries' responses were much more efficient than others. To better understand the role of trust within the COVID-19 pandemic, I reviewed literature of what role trust plays in countries facing past economic hardship or recession. Tormos (2019) studies something of an inverse to this question, asking to what extent is political trust negatively impacted by personal economic turmoil as a result of economic crisis. Tormos notes that previous studies have focused little on the effects of personal circumstances from economic crises as an effect on trust, focusing most research on economic and political performance of institutions as the core indicators of political trust. To test the question of personal impacts from the economic crisis on political trust. Tormos conducts survey analysis on Catalonia Spain, basing their responses about the effects of the 2008 Great Recession. The survey results indicated a causal effect that personal hardship reduces trust in institutions amidst economic hardship. These results were found on national and EU levels but not at regional levels (Tormos. 2019). While it indicated that there was a relationship between hardship and trust, it was not exactly what my research would be focused on. The results of this did demonstrate the importance of asking the question how do countries develop strong enough trust to handle hardship? Given the novelty of COVID-19, there is not an abundance of macro level research regarding the responses. Due to this I also decided to look micro level.

Ramesh & Arhira (2023) used difference-in-differences estimation icon to determine if there was a relationship between "Corporate Social Responsibility" (CSR), where firms hold themselves accountable to their stakeholders and firm performance using COVID-19 as a natural experiment. The study conducted cross-country analysis across 52 countries. The study found that CSR has a greater effect in countries with better governance and among non International Financial Reporting Standards adopters. The study also shows that trust established between firms and stakeholders via social responsibility pays off (Ramesh, V. K., & Athira, A. 2023). A study with contrasting findings to Tormos's paper is from Jack K. Day and Richard A. Settersten Jr. who focus on the relationship between social trust and social integration. Day and Settersten Jr. use a longitudinal study from the U.S Panel Study of Income Dynamics (PSID) on young adults (18-25) to measure if there is a reciprocal relationship between social trust and social integration in response to the Great Recession. Contrary to expectation, results showed that social trust was at its highest among young adults during

the recession. The study does follow other existing research in the conclusion that investments in social trust and integration can be mutually beneficial. The study additionally concludes that social trust and integration are robust and not negatively impacted as youth enter adulthood during a significant recession (Kay, Settersten Jr. 2018). This study is relevant in that it measures social capital, "the shared knowledge, understanding, norms, rules, and expectations about patterns of interactions that groups of individuals bring to a recurrent activity" (Durlauf. 2004), using social trust during times of recession. Interesting focus on young voters. The fact that trust did not go down for young adults during time of recession indicates to me that there is a possibility that trust is more durable in countries with higher levels of established trust before

In actually following the effect social trust has in a country during covid 19, Graziani et.al (2023) (carries out a study in Italy during the first phase of COVID-19 to determine how social trust "(i.e., trust in those who have the authority and responsibility for making decisions, such as the Italian government, the regional government, the Civil Protection, the European Union, the Catholic Church, and the scientific community)" and general trust "(i.e., trust in the trustworthiness of other individuals, such as Italians and humankind)" (Graziani et. al. 2023) have on people's social responses. The results of the study show that , at the individual level, higher social trust is positive coping strategies. In contrast, they are negatively related to the adoption of negative coping strategies. These findings point out the benefits of various types of trust in helping individuals deal with crises, such as the COVID-19 pandemic (Graziani et. al. 2023). This paper was originally used to learn more about the effects of trust on economic recovery from COVID19. Due to limitations that will be described in the methods and discussion sections this paper's research was unable to case study COVID-19. However, this paper still serves a role noting that under economic turmoil, social trust could still have a positive effect in economic growth either through continuous growth or mitigated economic damage.

To get a case study of trust impact on GDP growth during economic hardship, Lenton (2021) measured COVID-19 resilience in terms of declining death rates. The study finds a positive correlation between country-level resilience to COVID-19 and higher levels of trust. The study found that "All countries where >40% agree "most people can be trusted" achieve a near complete reduction of new cases and deaths" (Lenton. Et. al. 2021). Lenton et. al. effectively creates a trust-resilience model for countries responding to COVID-19. However this paper leaves more to be studied as it only measures resilience in terms of decaying death rate. This paper will expand upon the usage of 40% as a threshold for "high-trust" countries in the study. This paper will examine why Lenton uses the 40% threshold and also seek whether there are stronger measurements of a 'high-

trust' threshold. As stated above, while this paper's connection to COVID-19 will not be retested in this paper, it is still the model paper for introducing a high-trust threshold into the trust conversation.

Methods

Intro (Introduce topic and research/thesis)

This paper seeks to evaluate previous literature regarding the relationship of social trust on economic growth in the form of GDP per capita (GDPpc). As proven from previous literature, there is a casual relationship between social trust and economic growth. (Bjørnskov 2017, 2022; Cui 2017). Previous research has also established both theoretical basics (Knack & Keefer. 1997; Bjørnskov 2017). This research will first retest those findings by measuring a direct relationship with trust and GDPpc. This research will also expand from current research to measuring what should be used to define "high-trust" countries in terms of GDPpc. The two threshold options that will be used and compared for this are 40% and 60% of World Value Survey (WVS) respondents answering "most people can be trusted" when asked. This will help to give an idea when measuring how a country is doing in terms of trust levels. Given the findings of existing literature, this paper will hypothesize that:

1. There will continue to be a demonstrated positive correlation between social trust and economic growth.
2. In terms of High Trust (high trust = —-% trust rank on WVS):
a. Countries that respond =>60% on "most people will be trusted" will experience more GDPpc growth than countries at a 40% threshold for high trust.
b. High-trust countries (=> 40% agree "most people can be trusted") will experience greater GDPpc growth than low-trust countries.

Evaluate Past models/findings

This paper will be looking for two core styles of past modeling to evaluate. The first is establishing a working growth model. Following Professor Bjørnskov's work, this paper will use the same base for growth which is Solow's growth model (Bjørnskov 2022). Given this base model, this paper will model growth based on capital, k, and labor, l. This paper will use GDP per capita as an index for economic growth while using ___ to measure capital and unemployment to measure labor. The reason for using unemployment is to focus on the dramatic layoff of workers that came from shutdowns due to COVID-19. To account for the Technological Effects, t, in Solow's updated model (SOURCE) this paper will use high technology exports as a percentage of total manufactured exports to evaluate how technologically advanced a country is. Education, h, will be measured by looking into percent of population that completes primary (and secondary) education (Bjørnskov 2009). Trust will be measured directly with GDP per capita growth as well as alongside these other variables $k, l, t, \&, h$. Trust variable will be measured in two ways. The first way will be measuring trust as a continuous variable. In this, this paper will look to determine whether there is a positive relationship between trust and GDP per capita growth. The second method of examining trust will be turning trust into a dummy variable. For this dummy, highTrust = 1 if the percentage of respondents to the World Values Survey (WVS) question "I believe that most people can be trusted" equal to or greater than 40%. This is based on previous research measuring trust and resilience in the COVID-19 pandemic where there was a significant increase in resilience in terms of decaying death rate from COVID for countries that reported above 40% in surveyed trust based on WVS (Lenton et. al. 2021).

Describe your research additions

Review and evaluate past literature: This paper will be adding to existing methodology in a few ways. Previous literature has evaluated the impact of social trust on education (Bjørnskov 2009; Knack & Keefer. 1997). That research has gone on to prove an existing relationship between social trust and economic growth (Bjørnskov 2012, 2017; Creed 2019; Serritzlew et. al. 2014). Since the establishment of a trust-growth relationship, there has been further research into the mechanisms by which trust generates economic growth (Bjørnskov 2022; Cui 2017). This paper will test the relationship between trust and GDPpc following the basics of Bjørnskov's model. This will add to the literature by following up previous findings to contribute to a wealth of evidence in

support of trust having a positive influence on GDP or it will bring up conflicting findings that can be looked into more thoroughly.

Evaluating trust continuously and with a threshold: Most of the previous literature has established a relationship that as trust increases there is an increase in economic growth in terms of GDPpc (Bjørnskov 2012, 2017, 2022; Serritzlew et. al. 2014; Cui. 2017; Creed 2019). There is very little literature that examines a potential threshold for what would describe a 'high-trusting' country as compared to a 'low-trusting' country. As previously stated, this paper will measure two potential thresholds for high trusting countries. The first level will be WVS reporting "most people can be trusted" is >= 40% of total respondents. This is based on Lenton (2021) where he used a 40% threshold when measuring trust impact on COVID-19 response. This is one of the only models for a high-trust country found in previous literature. Given the lack of literature and that Lenton (2021) is focused on COVID-19 response as opposed to economic response, this paper will include another high-trust country threshold at WVS reporting "most people can be trusted" is >= 60% of total respondents. This creates a threshold for high-trust that is above the 50% marker. This paper will compare the results and significance of the two to determine whether or not there is

Data and Variables

Social Trust data is collected from the World Values Survey from Wave 3 (1995-1999) through Wave 7 (2017–2022). Trust data is the percentage of respondents who agree with the statement "most people can be trusted" (Q57). Responses to this question are often referred to in the literature as generalized trust, and sometimes as unspecified trust. World values data is collected in a series of five year averages. It measures social values that can impact a country's culture, politics and economics. It typically operates with a minimum of 1200 sample size in respondents to a given question.

Economic resilience/recovery variables were collected from World Development Indicators found on World Bank data. As a macro study, the data includes all available countries (varies per year). To match trust data, this paper selects years 1995-2022. The series variables included in this study are:

GDP per capita (2015 USD): is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in constant 2015 U.S. dollars. As stated previously, this paper uses GDPpc as a metric for measuring economic

growth. This paper intends to determine whether production is increasing as trust is increasing and if there are higher levels of production found in countries that would be considered 'high-trust' at a 40% or a 60% threshold.

Unemployment, total (% of total labor force) (national estimate): Unemployment refers to the share of the labor force that is without work but available for and seeking employment. Definitions of labor force and unemployment differ by country. Unemployment will be used as an inverse measurement of labor. Using unemployment we can control for the effects that labor is having on GDPpc which could potentially overlap with those of trust levels.

External balance on goods and services (% of GDP): External balance on goods and services (formerly resource balance) equals exports of goods and services minus imports of goods and services (previously non factor services). External balance can potentially explain fluctuation in GDP, therefore this paper will include it to determine if its effects are impacting results on social trust to GDPpc relationship.

Foreign direct investment, net inflows (% of GDP): Net inflows of FDI (% of GDP) is a measure that indicates the amount of foreign investment entering a country relative to the size of its economy, typically expressed as a percentage of Gross Domestic Product (GDP). This paper is interested in evaluating investment into countries that operated with higher levels of trust. There is interest in seeing the effect that foreign investment would have on an economy and if that impacts the relationship between trust and GDPpc.

High-technology exports (% of manufactured exports): Quantifies the proportion of a country's manufactured exports that are classified as high-technology products. This indicator provides insight into the technological sophistication and competitiveness of a country's manufacturing sector. High-technology exports typically include products such as aerospace products, computers, pharmaceuticals, scientific instruments, and telecommunications equipment. Once again in following the model there needs to be tech included as its impact on growth can be related to social trust as and GDPpc.

Investment in primary education ($ % of GDP): Quantifies the proportion of a country's GDP being allocated towards investments into primary level education. Used as an indicator to compare education levels across countries.

Data downloaded from World Bank and WVS to excel and organized then re uploaded to STATA to run analysis. In Stata, datasets merged by country code and year. Merges trust variable into World Bank data. A dummy variable is created to measure highTrust40 and highTrust60.

Mathematical/Regression formulas

I will run 3 regressions to measure a causal relationship between economic recovery in terms of GDP, Trade, and Unemployment. The models this paper uses to measure the relationship between social trust and GDPpc are:
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- *'i'* refers to cross-sectional data as this paper compares the effects of increasing rates of social trust on GDPpc across countries on a macro level.
- *'t'* refers to panel data as this paper compares the effects of social trust on GDPpc over time ranging from years 1995-2017.

y.hatit = trustit + lit +eit +hit + iit + eduit

This is to measure the same relationship between trust and growth described above but including other external factors that could relate to economic growth where 'y.hat' represent GDP per capita, , 'l' represents labor (measured by unemployment), 'e' represents external balance, 'edu' represents education (measured by investment in primary education, and investment (measured by direct and foreign investment).

y.hatit = highTrust40it + lit +eit +hit + iit + eduit

This is to measure the same relationship between trust and growth described above but including other external factors that could relate to economic growth where 'y.hat' represent GDP per capita, , 'l' represents labor (measured by unemployment), 'e' represents external balance, 'edu' represents education (measured by investment in primary education, and investment (measured by direct and foreign investment).

y.hatit = highTrust60it + lit +eit +hit + iit + eduit

This is to measure the same relationship between trust and growth described above but including other external factors that could relate to economic growth where 'y.hat' represent GDP per capita, , 'l' represents labor (measured by unemployment), 'e' represents external balance, 'edu' represents education (measured by investment in primary education, and investment (measured by direct and foreign investment).

Limitations

Data Constraints: One of the primary limitations stems from the data availability and quality. This paper set out with the original goal of answering the question of how economies with higher trust recovered economically from the recession caused by the COVID-19 pandemic compared to countries that display lower trust levels. In measuring trust as a quantified variable, this study takes from WVS series datasets. Due to the fact that WVS data on trust is collected in Waves of five years at a time, the time series is not evenly synced with the variables found from World Bank's World Development Indicators, which are measured yearly. Unfortunately, given the data constraints and time constrictions, this study will not be able to examine the impact that social trust had on countries economic recovery from COVID-19 as the years of this working data now end at 2017.

Assumptions and Simplifications: This paper had to simplify on previous models due to time and data limitations. In this, there are still variables that could have relevance in being included in future regression tests such as domestic investment, trade as a % of GDP, and investment in secondary education to name a few.

External Validity: When measuring a social variable such as trust, variations in institutional frameworks, cultural factors, or policy interventions can have influence that impacts how the relationship between trust and GDPpc appears. Some countries have different values around social trust and that could affect how fluctuations in social trust impact the economy as a whole. This means that it can be difficult to determine the applicability of our results beyond the specific context of our study.

Endogeneity and Causality: Identifying causal relationships in economic research can be challenging, particularly due to endogeneity issues. Some examples of this include simultaneity, omitted variable bias, and reverse causality. For simultaneity it is possible that the relationship goes both ways where rise in GDP increases trust while trust at the same time increases GDP. Omitted variable bias is certainly a possibility given there are certain variables based on a cultural bias that could be overlooked when considering trust. I based my model primarily on Danish economist Christian Bjørnskov's work so it's possible that variables included lean towards a western perspective. Given the econometric techniques applied, the possibility of omitted variable bias or reverse causality cannot be completely ruled out, which may impact the reliability of our causal inferences.

Results

Exhibit 1 measures the direct relationship between social trust and economic growth measured by GDP per capita while including variables: trade balance, labor (measured by unemployment), education and investment (measured by direct and foreign investment). Sample size for this regression is n = 58. Regression demonstrates a positive correlation between trust and growth, trust coefficient = 802.83. Results demonstrate significant effect of trust, $p < 0.001$. R_squaredAdj = 0.83. Tech also has a positive and significant impact on GDPpc growth, $p < 0.01$

Exhibit 2 measure the high trust threshold where at least 40% of WVS respondents state "most people can be trusted" by measuring dummy variable highTrust40 on GDP per capita while including variables: external balance, labor (measured by unemployment), education (investment in primary education) and investment (measured by direct and foreign investment). Sample size for this regression is n = 58. Regression demonstrates a positive correlation between trust and growth, trust coefficient = 29508.33. Results demonstrate significant effect of trust, $p < 0.001$. R_squaredAdj = 0.71. Tech and education also have positive and significant impacts on GDPpc growth, $p < 0.01$.

Exhibit 3 measures the direct relationship between highTust40 acting on the continuoud trust variable and economic growth measured by GDP per capita while including variables: trade balance, labor (measured by unemployment), education and investment (measured by direct and foreign investment). Sample size for this regression is n = 58. Regression demonstrates a positive correlation between trust and growth, trust coefficient = 716.93. Results demonstrate significant effct of trust, $p < 0.001$. R_squaredAdj = 0.83. The impact of highTrust40 on continous trust variable is 94.85. However, the results are insignificant as $p > 0.10$. In this model, tech also has a positive and significant impact on GDPpc growth, $p < 0.01$

Exhibit 4 measure the high trust threshold where at least 60% of WVS respondents state "most people can be trusted" by measuring dummy variable highTrust60 on GDP per capita while including variables: external balance, labor (measured by unemployment), education (investment in primary education) and investment (measured by direct and foreign investment). Sample size for this regression is n = 58. Regression demonstrates a positive correlation between trust and growth, trust coefficient = 295695.14. Results demonstrate significant effct of trust, $p < 0.001$. R_squaredAdj = 0.49. Tech and education also have positive and significant impacts on GDPpc growth, $p < 0.01$.

Exhibit 5 measures the direct relationship between highTust40 acting on the continuoud trust variable and economic growth measured by GDP per capita while including variables: trade balance, labor (measured by unemployment), education and investment (measured by direct and foreign investment). Sample size for this regression is n = 58. Regression demonstrates a positive correlation between trust and growth, trust coefficient = 753.34. Results demonstrate significant effct of trust, $p < 0.001$. R_squaredAdj = 0.86. The impact of highTrust60 on continous trust variable is 1282.13. However, the results are insignificant as $p > 0.10$. In this model, investment and education also have a positive and significant impact on GDPpc growth, $p < 0.05$.

Table 1 shows a marginsplots for highTrust40 effect on trust in relation to GDPpc growth. Results begin to become significant, where no part of the plot is $=< 0$. There is very little difference in the trends between continous trust variable (highTrust40 = 0) and the 40% theshold of trust highTrust40 = 1.

Table 2 shows a marginsplots for highTrust40 effect on trust in relation to GDPpc growth. Results begin to become significant, where no part of the plot is $=< 0$. There is very little difference in the trends between continous trust variable (highTrust40 = 0) and the 40% theshold of trust highTrust40 = 1.

Discussion

The findings from Exhibit 1 serve to support for this papers hypotheses in terms of the seen positive correlation between social trust and economic growth. The regression analysis, operating with a sample size of n = 58, reveals a substantial and statistically significant relationship between social trust and GDP per capita growth, with a trust coefficient of 802.83. This suggests that for every unit increase in social trust, GDP per capita grows by approximately 802.83 US dollars, all else being equal. Given this positive relationship, the results follow work of existing literature (Bjørnskov. 2017, 2022; Cui 2017) in underscoring the importance of trust in fostering economic growth. These results are validated by the significant effect of trust given a p-value of less than 0.001. To further validate these findings, the results form Exhibit 1 boast high adjusted R-squared value of 0.83. This indicates that the combination of included variables within the model, including trade balance, labor, education, investment, and technology, explain a substantial portion of the variance in GDP per capita growth. This model does not adress the hypothesis regarding the

theshold level for trust, those will be convered in following exhibits. However, given these findings, this paper determines that Exhibit 1 is effective in reaffirming previous research regarding evidence supporting the pivotal role of social trust in driving economic prosperity.

Before adding addition variables to the regression to deepen findings on a trust-growth relationship, this paper also wants to test the specific difference between high trust and low trust countries. Exhibit 2 directly examines how countries that are "high-trust" grow economically speaking comparted to "low-trust" countries. Again, high-trust is measured by dummy variable hightTrust that present when WVS respondents respond that they believe "most people an be trusted" 40% or more of the time. With a sample size of n = 58, regression analysis indicates a positive correlation between highTrust60 and growth, with a trust coefficient of 29508.33. This positive coefficient follows previous literature in the conclusion that high trust countries would demonstrate more economic growth and efficiency than low trust countries (Bjørnskov 2012, 2017; Cui 2017; Lenton et. al. 2021). Given p-value being less than 0.001, the results displayed by Exhibit 2 suggests a notable level of statistical significance. While these results imply a strong degree of statistical certainty in the findings, there should still be a cautious interpretation of the observed relationship. To further validate these findings, the results form Exhibit 2 boast high adjusted R-squared value of 0.71. This indicates that the combination of included variables within the model, including trade balance, labor, education, investment, and technology, explain a substantial portion of the variance in GDP per capita growth. This paper does not compare hgihTrust40 to highTrust60, its purpose following work from Lenton (2021) to determine if 40% could also be an appropriate metric when doing economic reseatch. Given this focus, the results from Exhibit 2 indicate that if used as a threshold, a 40% trusting rate could be suffcent to qualify as 'high-trust' for a country being compared in terms of being a singificant measurement in economic research. However, as discribed from exhibit three there will be more research needed to determine these finindgs.

Exhibit 4 measures the same relationship of high trust effect on GDPpc but with a high trust threshold of 60%. With a sample size of n = 58, I first conduct a regression test focused specifically on the variables GDPPC2015 and the dummy variable "highTrust " to establish a basic relationship. The regression analysis uncovers a positive correlation between highTrust40 and growth, with a trust coefficient of 295695.14. This positive coefficient follows previous literature in the conclusion that high trust countries would demonstrate more economic growth and efficiency than low trust countries (Bjørnskov 2012, 2017; Cui 2017; Lenton et. al. 2021). Given p-value being

less than 0.001, the results displayed by Exhibit 4 suggests a notable level of statistical significance. Using a threshold of 60% to define high trust, there is a slightly larger effect on GDPpc, however, both result in a significant increase in GDPpc. Exhibit 4 has an adjusted R-squared value of 0.49. This is lower than that with a high trust threshold of 40%, indicating that a model using a 60% threshold may be less good at explaining effects in GDPpc growth than a model using a 40% threshold. This could be due to the lack of responses with highTrust60 = 1. Given this, the threshold of 40% found in Lenton (2021) may remain to be the appropriate metric when doing economic research. However, as described from exhibit three there will be more research needed to determine these findings for either threshold.

The results from Exhibit 3 analysis of the relationship between a high trust threshold at 40% and trust as a continuous variable while comparing how the two in combination affect economic growth. The findings from Exhibit 3 follow those from Exhibit 1 in confirming the hypothesis of a positive correlation between social trust and GDP per capita growth. The trust coefficient of 716.93 underscores the significance of trust in fostering GDPpc growth while controlling for other variables such as trade balance, labor, education, and investment. Once again these findings follow research from existing literature such as Bjørnskov (2017, 2022) and Cui (2017). However, results from analyzing the impact of the high trust threshold at 40% on trust as a continuous variable suggests that while overall trust is indeed crucial for economic growth, the specific threshold of 40% agreement may not be a significant determinant of economic performance. This comes from the results of highTrust40 on trust variables showing statistically insignificant results ($p > 0.10$). This finding challenges understanding from previous literature (Lenton. 2021) about using 40% as a threshold at which social trust enacts the greatest influence on GDPpc growth. The same can be found in Exhibit 5 when measuring the relationship of a high trust threshold at 60% on trust and the combined effect on GDPpc growth. While the relationship was larger than with the 40% threshold, given a coefficient of 1282.13, results still remained insignificant for this relationship. Tables 1 and 2 analyze the usage of thresholds to define high trusting countries in terms of effect on GDPpc. In comparing the two tables, both follow the overarching hypothesis in that there is a clear and significant relationship between trust and GDPpc growth found. Table 1 is the margins plot comparing high trusting countries at a 40% threshold (highTrust 40) compared to a standard continuous thrust measurement. The results for this table indicate that there is significant in results regarding a trust-GDPpc relationship at around 30%. This means that above 30% could be used to determine significant results for high-trusting countries. However, table 1 also shows that there is

little difference between measuring high-trusting countries with a threshold of 40% as opposed to using trust as a continuous variable. These results are slightly different in Table 2, which compares high trusting countries at a 60% threshold (highTrust 60) compared to a standard continuous thrust measurement. In Table 2, results are not significant until trust reaches 60%. However, once 60% threshold is hit there is a greater difference between the high-trust threshold metric compared to a continuous measurements. Overall, using 40% as a high-trust threshold as in Lenton (2021) is the more appropriate use as it contains a greater amount of significant results and neither threshold demonstrate significant differences from measuring trust as a continuous variable.

Future ResearchTrust on economic resilience - Covid-19

Future research can seek to answer the question of how economies with higher trust recovered economically from the recession caused by the COVID-19 pandemic compared to countries that display lower trust levels. As proven from previous literature and further backed by this paper, there is a casual relationship between social trust and economic growth. (Bjørnskov 2017, 2022; Cui 2017). When measuring growth in the past, the focus has been on economic growth measured through Gross Domestic Product (GDP). However, the previous research does not focus on how trust potentially mitigates economic shock or recession. Will look at the impact a country has on a country's GDP, trade, inflation, foreign investment, and unemployment before, during, and after COVID-19. This will allow comparisons of how given countries were economically doing before COVID-19, how said countries were directly impacted economically throughout the pandemic, and the rate at which counties with varying trust levels recovered. This could allow researchers to examine trust as an IV on economic recovery which would add to existing methodology in a few ways. The first way is that social trust will be examined as a variable that impacts economic recovery in response to economic shock or recession. There is little research focused on the potential for trust to generate economic resilience from times of hardship or recession.

Another way in which a focus on trust and economic resilience through COVID-19 would be adding to existing literature is focussing specifically on trust impacts economic recovery from a novel pandemic. There have been studies that attempt to forecast economic recovery from COVID-19 (Foroni, C., Marcellino, M., & Stevanovic, D. 2022). What studies that forecast recovery do not include is a focus on social capital such as social trust. There is also literature on the effects of social

trust on firm performance during COVID-19. The study measured run regressions to measure firm performance using (TobinQit). The study used COVID-19 as a dummy variable in which value 0 = economic quarters of active COVID-19 while 1 = quarters post-COVID-19. The study demonstrated that when firms and markets and firms are suffering due to recession caused by the pandemic, social trust has social pay off in the form of social responsibility (Ramesh, V. K., & Athira, A. 2023). While this test asks a similar question to mine and focuses on COVID-19, it does not measure economic recovery at a national scale.

Lastly, there is some research into how trust affects resilience at the national level. The research runs multiple regression tests to understand how social trust impacts the recovery. The test measured a country's resilience on demographic, financial, and public health levels. The paper found a positive correlation between higher levels of social trust using the WVS metric of "most people can be trusted" (Lenton et. al. 2021) Future research can follow in much of the methods but should take a stronger focus onto the economic side of resilience. This will be by including more economic variables in regression analysis such as unemployment, education, and technological status of countries that could interfere with measuring resilience from trust. A study such as this could also include data from 2022 onward as well to further understand the extent of recovery for countries as COVID-19 is so recent each new year of data further tells stories about resilience, economic or otherwise.

The last addition future literature could make to existing literature is adding trust in science as an endogenous variable. Given the nature of COVID-19 and the polarization in the United States around trust in the majority opinion of scientists, there is a lack of understanding around how greatly this trust in science impacted economic recovery.

Other mechanisms for expanding on this and existing research regarding trust and economic performance include going into more details about the mechanisms of GDPpc growth through trust and further examination into thresholds for high-trust countries as mentioned above. As discussed in Bjørnsov (2022) there is a clear relationship found between increased rates of social trust and improved GDP performance. However, in comparing indirect and direct effects from trust on to GDP performance as described in his model (Bjørnskov. 2017) there is more research to determine the core mechanisms by which trust impacts growth. The current research is learning to trust impacting growth on a direct method of lowering transaction cost as opposed to indirectly through mechanisms such as education (Bjørnsov. 2009) or formal institutions (Cui. 2017).

As demonstrated from this paper, it is unclear whether the usage of creating a threshold for defining a country as high-trust will provide better understanding of the impact that trust has on GDPpc growth. One thing that future research could do to gain a better understanding around this topic is to include a greater amount of data that includes a 60% threshold to see if the results become more significant with more data points. However, this may be a real life limitation as many countries may not respond with that high of a trust level.

Conclusions

In conclusion, the results presented in this paper follow precious literature (Bjørnskov 2017, 2022; Cui. 2017; Knack and Keefer. 1997) the hypothesis that there exists a positive correlation between social trust and economic growth in the form of GDP per capita. Through a series of exhibits, it becomes evident that higher levels of social trust are associated with greater GDP per capita growth. Exhibit 1 establishes a significant relationship between social trust and GDP per capita growth, answering the overarching hypothesis that trust plays in stimulating GDPpc growth. The following exhibits attempt to evaluate distinctions between high-trust and low-trust countries. The results generally confirm that nations where at least 40% of respondents agree that "most people can be trusted" experience greater economic growth compared to their counterparts. However, there is more research to be done in order to determine if the use of a threshold provides any more valuable insight than simply evaluating trust as a continuous variable. While comparing thresholds for defining high-trust countries, it becomes apparent that a 40% threshold may be more appropriate than a 60% threshold, given its greater quantity of significant findings.

 Looking forward, future research directions outlined in this paper, such as exploring the impact of trust on economic resilience, how trust impacted economic recovery from COVID-19, further investigation into the mechanisms through which trust impacts economic growth and exploring optimal thresholds for defining high-trust countries, can help further understanding regarding how trust interacts with economic prosperity in countries. In parting, this study reaffirms the

positive correlation between social trust and economic growth but also sets the stage for further exploration into this dynamic relationship.

Exhibits and Tables

Referenced Model 1. Bjørnskov's Theoretical Options
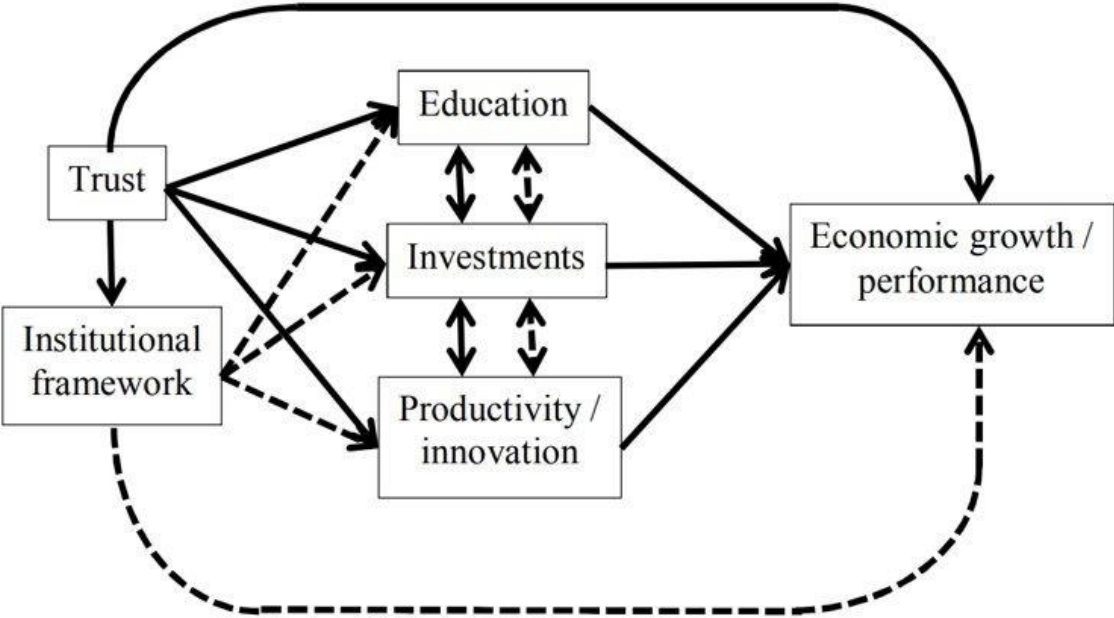
Figure 1. Theoretical options

Exhibit 1

	(1)
	trustRegression
trust	802.832***
	(77.255)
externalBal	0***
	(0)
unemploymentTotal	1.543
	(274.328)
eduPrimary	159.466
	(104.054)
forgienInvest	112.713
	(72.718)
tech	250.198***
	(92.278)
_cons	-17352.825**
	(8281.567)
Observations	58
R-squared	.83

*Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1*

Exhibit 2

	(2)
	highTrustRegression
highTrust40	29508.331***
	(4544.424)
externalBal	0***
	(0)
unemploymentTotal	-74.384
	(358.753)
eduPrimary	350.798***
	(129.557)
forgienInvest	26.038
	(93.84)
tech	448.771***
	(116.93)
_cons	-22378.848**
	(10804.424)
Observations	58
R-squared	.711

*Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1*

Exhibit 3

	(3)
	highTrustXtrust
trust	716.925***
	(134.238)
0b.highTrust40	
1.highTrust40	-669.938
	(17114.833)
0b.highTrust40#~t	
1.highTrust40#c~t	94.851
	(322.737)
externalBal	0***
	(0)
unemploymentTotal	14.502
	(278.846)
eduPrimary	163.882
	(106.236)
forgienInvest	106.766
	(74.097)
tech	269.25***
	(96.652)
_cons	-16823.071*
	(8442.764)
Observations	58
R-squared	.833

Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1

Exhibit 4

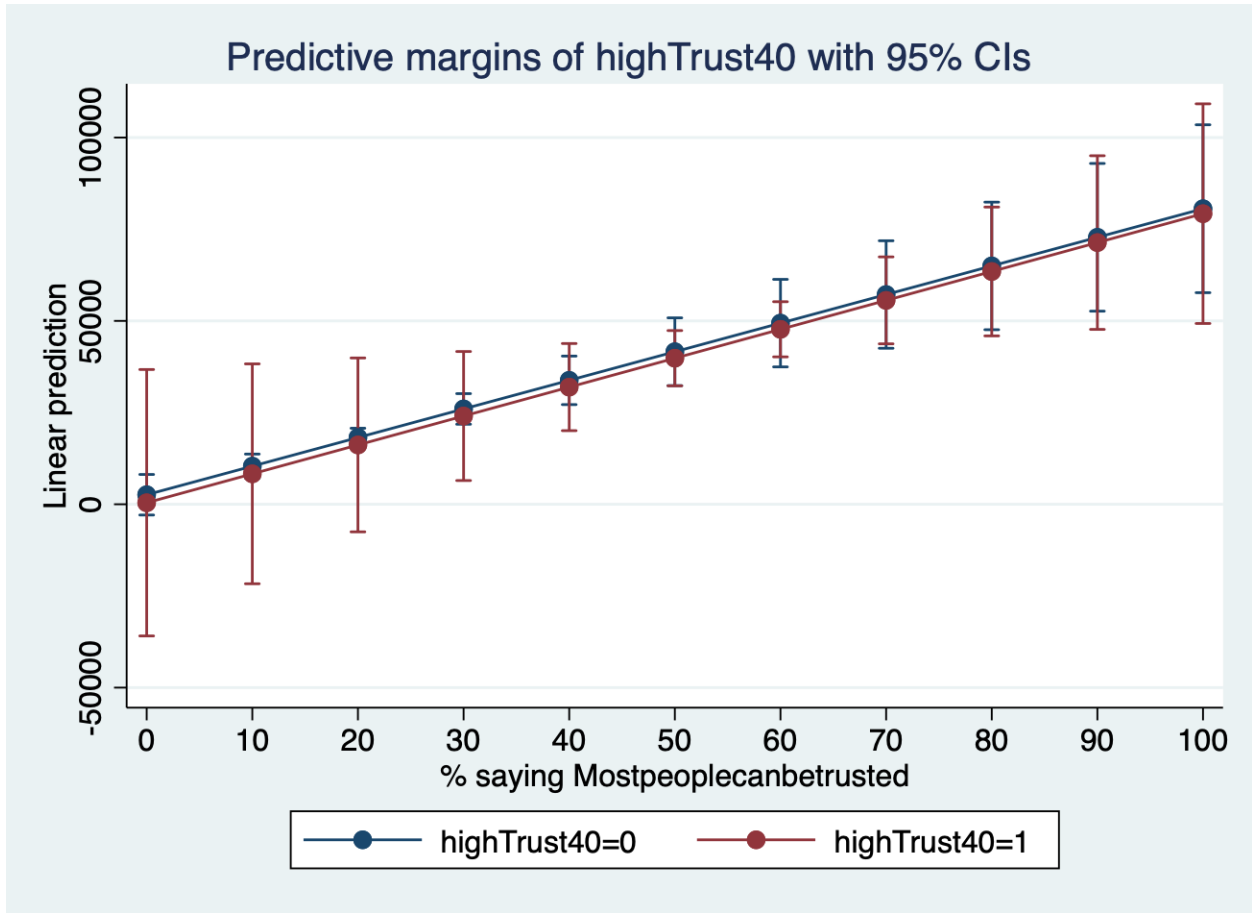| (4)	
Regression_highTr~60	
highTrust60	31475.472***
	(6556.269)
externalBal	0***
	(0)
unemploymentTotal	-311.285
	(397.714)
eduPrimary	489.089***
	(139.742)
tech	459.789***
	(131.114)
forgienInvest	34.341
	(105.523)
_cons	-31178.473**
	(11842.611)
Observations	58
R-squared	.636

*Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1*

Exhibit 5

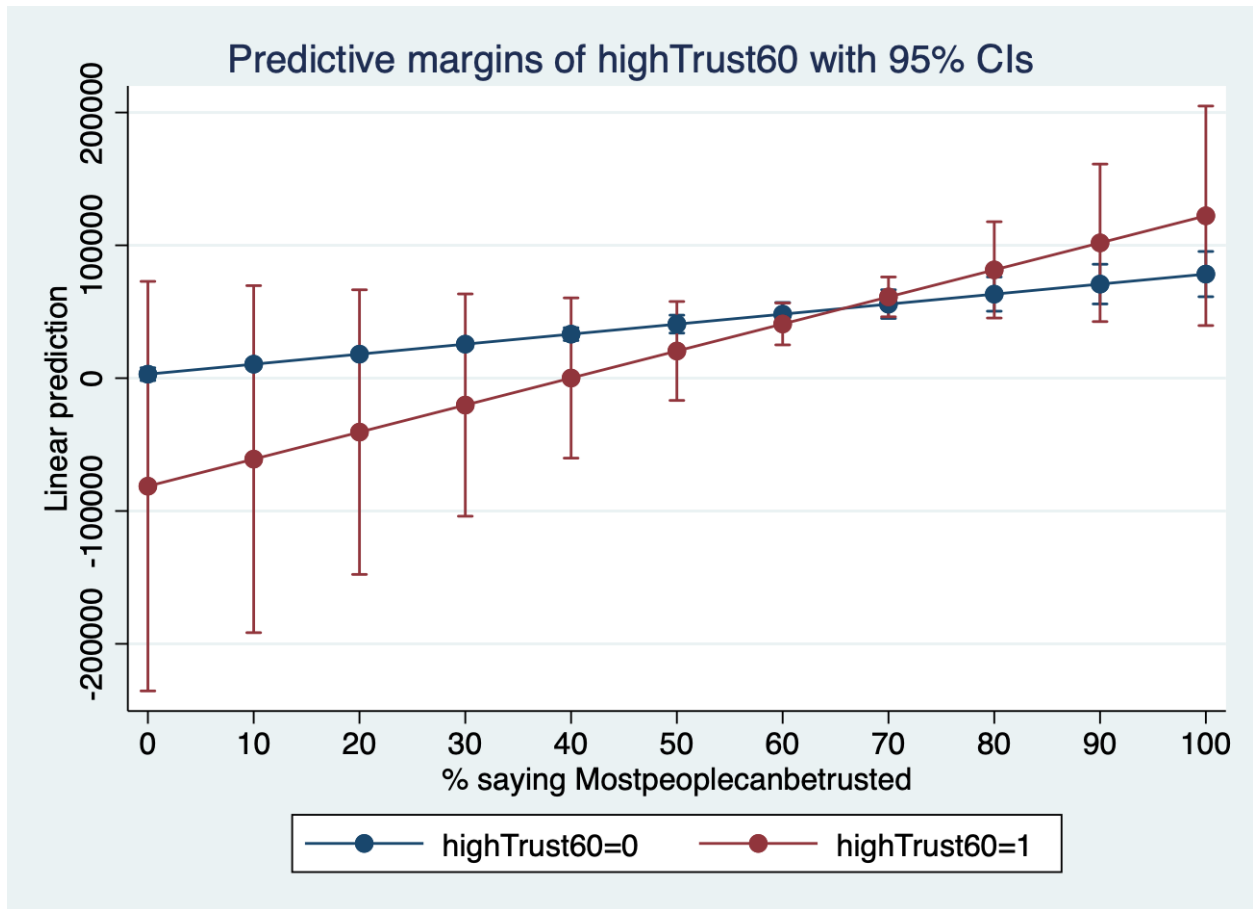|	(5)
	HighTrust60OnTrust
trust	753.338***
	(105.931)
0b.highTrust60	
1.highTrust60	-84330.579
	(77443.848)
0b.highTrust60#~t	
1.highTrust60#c~t	1282.134
	(1187.308)
externalBal	0***
	(0)
unemploymentTotal	-473.844
	(291.214)
eduPrimary	248.994**
	(101.346)
forgienInvest	166.165**
	(80.878)
_cons	-16686.837**
	(7816.075)
Observations	86
R-squared	.695

*Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1*

Tabel 1

Predictive margins of highTrust40 with 95% CIs

Tabel 2

Predictive margins of highTrust60 with 95% CIs

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