

A reevaluation of the right amount of trust

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Abstract: This paper examines the relationship between individual trust and individual economic performance. The research builds on the methodology and findings of an hump-shaped trust-income relationship presented in The Right Amount of Trust paper by Jeffrey V. Butler, Paola Giuliano, Luigi Guiso (2016). While that paper is limited by data until 2011 this paper has data until 2022. The new results confirm the hump-shaped pattern but presents an increased optimal trust level that also yields an increased income premium. From an optimal trust level of 7/10 with an income premium of 14% to an optimal trust level of 8 with an income premium of about 16%. Furthermore the results conclude that trust levels are dependent on the general trustworthiness of the population and that trust levels around the optimal level of trust generates small drops in income while larger trust deviations from the optimal level can impose significant income losses. The findings hold both in the European social survey (presenting large-scale international survey data) as well as in the SOM-survey (presenting detailed data within Sweden, which is a country with high quality institutions).

Keywords: Trust, Income, Hump-shaped relationship, Europe, Economic performance, Human development

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1. Background

This paper will examine the effect an individual's trust in other individuals has on the individual's income. This topic has been chosen for two main reasons. Firstly, a positive causation in this research field could push humans to be more trusting, which many would consider a heartwarming development for humanity. However it can go the other way around if there would be a negative causation. Secondly, the majority of the research between trust and income have historically been looking at aggregated levels of trust and income. One of those historical papers, authored by Kenneth Arrow in 1972, stated that “it can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence”.¹ As the aggregated relationship has been researched for long this paper instead chooses to build upon a more novel paper in this area, focusing on the trust-income relationship at an individual level. This is the *The Right Amount of Trust* paper, written by Jeffrey V. Butler, Paola Giuliano, Luigi Guiso and published in Juli 2016 referred to as *the previous paper*. While the previous paper offers a robust methodology for dealing with issues such as unobserved variable bias and reverse causation it is clearly limited by its latest data points being from 2010/2011. In order to reevaluate the research of the previous paper and make it more relevant, this paper builds on the same methodology but with updated data.²

Two main data sources are used. Firstly, for measurement in 39 countries across Europe the European Social survey, *ESS* and all its ten available measuring periods (called *waves*) are used. The first wave includes data from 2002/2003 and the tenth from 2020/2022³. Secondly, for more specific measurements, the SOM data set, from the SOM institute from University of Gothenburg, offers detailed data across different regions in Sweden. Similarly as for the *ESS* the previous paper is limited to historic data. In this case their latest SOM data points is from 2009 while this paper includes data from all years between 1996-2022. With this background, about the research topic as well as the data gathering, the next section is outlining the empirical model for examining the trust-income relationship.

¹ Kenneth Arrow, *Gifts and Exchanges*, (Philosophy and Public Affairs: 1 & pages 343–362, 1972)

² Jeffrey V. Butler, Paola Giuliano, Luigi Guiso, *The Right Amount of Trust*, (Journal of the European Economic Association: Volume 14, Issue 5 & Pages 1155–1180, 2016.), page. 1-4

³ While the majority of the *ESS* rounds have builds on two year data periods the latest builds on data between 2020-2022

1.1 Empirical model - Individual trust and Economic performance

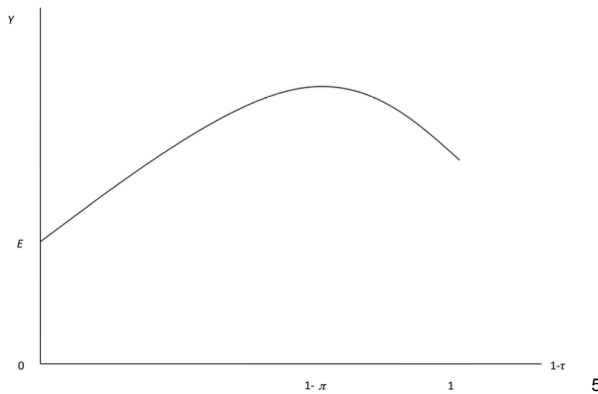
This section presents a summary of a simple empirical framework to motivate the relationship between income and trust, inspired by the previous paper.

The model constitutes of the following formula:

$$Y(S^*_\tau) = E - S^*_\tau + \pi \gamma f(S^*_\tau)$$

- E represents a broad interpretation of endowment that a person can utilize.⁴
- S^*_τ denotes the optimal amount of invested endowment when beliefs about others trustworthiness equals τ .
- The whole function $Y(S^*_\tau) = E - S^*_\tau + \pi \gamma f(S^*_\tau)$ represents the true expected income given the true trustworthiness of the population π .
- $\pi \gamma f(S^*_\tau) - S^*_\tau$ represents the return of an individual's invested endowment and peaks when a person's trust beliefs are equal to the trustworthiness of the population ($\pi = \tau$) which predicts a theoretical hump-shaped relationship presented below.

Figure 1 - predicted trust-income relationship



The model predicts that insufficient trust would impose too little invested endowment which in the broad interpretation can mean too little invested capital but also too little effort in work or that a researcher is sharing too little ideas to coworkers. The idea is that defensive trust belief leads to missed opportunities. Furthermore the model also predicts that too much trust would impose overinvesting of endowment which can be bad as it exposes the individual of an increased risk of being cheated on. In conclusion the model proposes an optimal level of

⁴ From the previous paper: "The endowment could represent capital contributed to a project run by an entrepreneur or money invested in a fund managed by a professional, which affects income from capital. Alternatively, E could be the time and effort (human capital) that a worker allows his or her boss to manage in hopes of advancing more quickly along the career path, which affects labor income. Or, in a more familiar setting, E could represent ideas that a researcher shares with coauthors on a joint project."

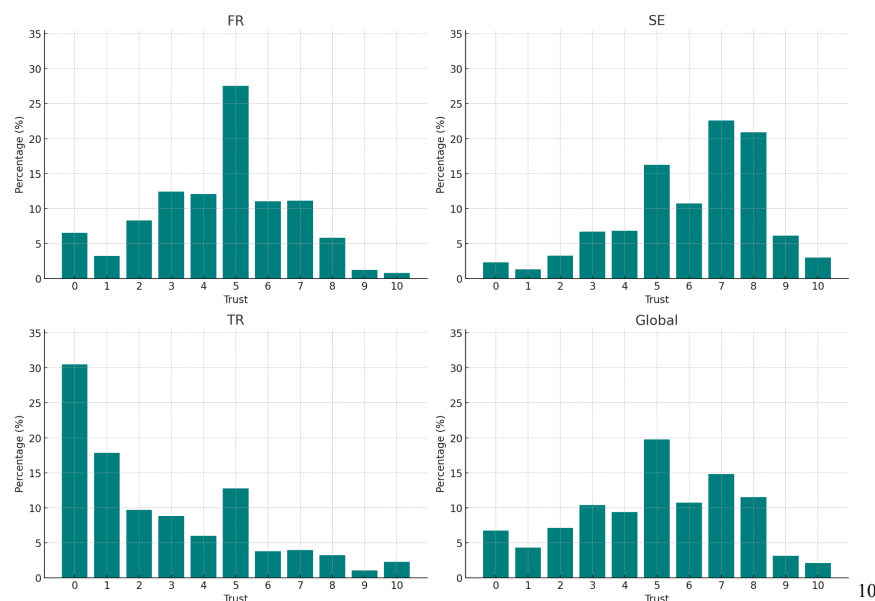
⁵ Butler, Giuliano, Guiso. p. 5

trust that is dependent on the general trustworthiness of people in a specific country.⁶ The next section presents an overview of the methodology for this model and its obtained results.

1.2 Overview of the paper and its results

In order to give a coherent presentation of the methodology and the obtained results, from putting the empirical model in section “1.1 Empirical model - Individual trust and Economic performance” into practice, several steps need to be taken. Firstly the trust parameter is explained. Starting with the ESS data the trust parameter is giving information about individual beliefs regarding how much the average person should be trusted. Trustworthiness is measured on a scale from 0 to 10 where zero means no trust at all and 10 means that the most individuals can be fully trusted.⁷ This definition is similar in the SOM data set as well⁸. With the trust variable explained figure 2 below presents trust distributions for three selected countries from the ESS.⁹

Figure 2 - Trust distributions in different countries



On a first glance it is evident that the trust distributions are looking different. Turkey has a left tail distribution while Sweden has a right tail distribution and France a distribution centered around 5 in trust. Since figure 2 showcases that trust levels vary significantly among individuals both globally and in each example country, it seems that different people believe that different levels of trust is appropriate. Furthermore this implies that all people can not

⁶ Butler, Giuliano, Guiso. p. 5

⁷ See section 2.1 “The European Social survey” for exact wording in the ESS.

⁸ See section 2.2 “The SOM survey overview” for exact wording in the SOM.

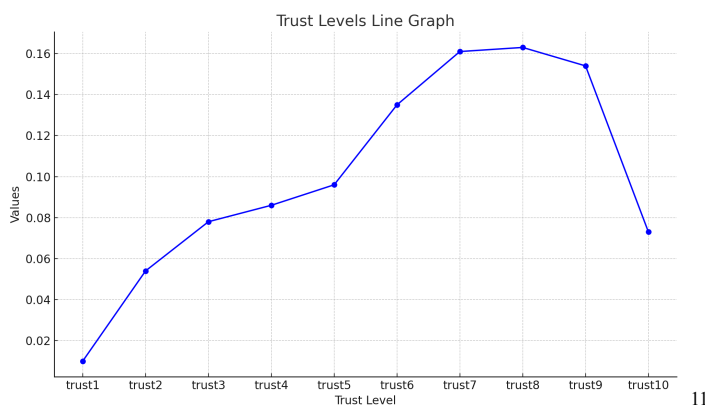
⁹ The selection is done to represent a low trust, medium trust and high trusting country where Turkey is representing a country where trust levels are low, France is representing a country with medium trust and Sweden is representing a country with high trust. See section 3.1.1 “High trust, medium and low trust countries” for further information about the categorization of countries

¹⁰ European Social Survey, *ESS Data Portal*, <https://ess.sikt.no/en/?tab=overview> [retrieved 2024-04-05].

simultaneously be right about their trust beliefs from an economic standpoint which is a crucial thing to conclude in order to be able to find an optimal trust level. As this is crucial but simultaneously can be argued against, it sheds light on the first issue to address. This issue builds on the fact that one might argue that respondents actually respond in a biased way based on the circle of people they are interacting with. Furthermore this may open up a possibility where everybody could be right simultaneously, from an economic standpoint, and is further looked into in section 1.3.4 “Risk of homogeneity”. For now the assumption that individuals in the survey are actually talking about trust to the general person in society, which would be homogeneous across individuals, is accepted. Building on the heterogeneous beliefs (individual unique beliefs about the extent the homogenous average person in society should be trusted) some people should be overly pessimistic while some should be overly optimistic. The overly pessimistic will miss opportunities that could increase their income while the overly optimistic have higher chances of being cheated on. This is suggesting a hump-shaped relationship with an optimal level of trust, “The right amount of trust”, that is attained by individuals that have trust beliefs that are in line with the average trustworthiness of individuals in their given country.

Using the ESS measurement of trust, individuals' income is regressed on a set of dummies for the eleven different trust levels. As suggested in the empirical model the result shows an hump-shaped relationship where income differs significantly between low and high trusting individuals. See figure 3 below:

Figure 3 - a graphical representation of the trust-income relationship in the ESS data



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Income is increasing steadily and peaks at a trust level of 8. After the peak the decrease between 8 to 9 is quite small while the decrease from 9 to 10 is more significant. In fact the difference from the lowest level of trust (0) to the peak level of trust (8) is above 16%. In the previous paper the optimal level of trust (7) was leading to a 14% increase in income compared to the lowest level of trust. Furthermore, in the previous paper, this difference was compared to the additional income from obtaining a college degree which, when that research was conducted, was at the same level as the potential income premium (14%). Expanding on this analysis, the data from this paper show that the income loss between the optimal level of trust (8) to the maximum level of trust (10) is around 9% compared to 7.3% in the previous

¹¹ European Social Survey, *ESS Data Portal*

paper. However for individuals between ± 1 trust levels around the optimal trust level (7-9) the difference is smaller, ranging in an interval of 0,9%. This implies that a big deviation around the optimal level of trust can be quite costly while small deviation around the optimal level is not as big of a problem. While this section has provided an overview in the methodology and results there are some concerns that need to be addressed in order to build confidence around the hump-shaped relationship and absence of reverse causality.

1.3 Potential concerns and how they are addressed

1.3.1 Reverse causality overview

One general concern in scientific papers, including this one, is reverse causality. In this case it would impose that higher income could be leading to higher trust rather than the other way around. While this concern could explain the increasing trend between zero to eight it struggles to explain the hump-shape and the drop between 8 to 10. For the increasing part it would imply that people, as they get richer, become more open to try more opportunities as they can afford to take more risks and thus trust others more. This makes sense, however that this trend would then stop and that people with either trust level three or trust level 10 would have the same income is not as intuitive. As the hump-shaped relationship is the main argument against reverse causality it is important to address a potential scenario where income could be causing a hump-shaped trust pattern. This is in a situation building on two assumptions. First that income is maximized by matching one's trust level with the general trustworthiness of a population and secondly that more income allows for better predictions of others trustworthiness. If this would be true people with higher income should have more precise trust beliefs while poorer people would have more spread out trust beliefs. Hence, to test this, the variance of trust is regressed on income for all of the countries in the sample in section 3.1.4 “The risk income causing the hump-shaped trust relationship”. If income is actually causing a hump-shaped trust relationship one should expect a negative relationship between variance in trust and income. However, if it instead is trust causing the hump shaped relationship, as the hypothesis of this paper is suggesting, one would instead expect a positive relationship between trust and variance on income. This because higher trust yields both higher possibility of taking more profitable opportunities but also greater risk of being cheated. When trust is low income is more predictable. To argue against reverse causation one would not want to see a clear negative correlation between income and variance and trust while instead seeing a clear positive relationship in trust and variance in income. This is analyzed in more detail in section 3.1.4 “The risk income causing the hump-shaped trust relationship”. Moving on there are three other issues that are needed to address in order to be able to argue for the hump shaped relationship as an explanation for ruling out reverse causality.¹²

¹² The methodology is explained further in section 3.1 “Empirical analysis”

1.3.2 Potential special characteristics of individuals causing the hump-shaped relationship

The first issue is that the hump-shaped relationship mainly comes from the drop in income of individuals with maximum trust beliefs. This raises a concern that people on extremes could represent outlier cases which are not representative for the whole population. In this case this would imply that people with maximum trust beliefs have different characteristics than the average person. This is addressed in three ways.

Firstly section “3.1.2 Comparing individuals with 10 in trust to the median person” shows that there is no significant difference in terms of observables from the maximum trusting person in comparison with the median person. Secondly a further comparison is done by dividing the ESS countries into low trusting countries, medium trusting countries and high trusting countries which all have significantly different amounts of people with 10 in trust. Here the results show that all different categories have hump-shaped and similar patterns. Thirdly the SOM data set provides more detailed data about Sweden which has a high percentage of people within the upper tail of the distribution. Even here the hump-shaped relationship holds.

1.3.3 Risk of composition effect while sub-groups have differing trust beliefs

Since this paper uses pooled data for regression analysis, there is a risk that different subgroups might actually hold different trust beliefs. This could be subgroups of countries but also subgroups within countries. The SOM data set is a way of addressing this issue as it allows us to split the sample into several subgroups with different observable characteristics. By looking at whether the hump-shape still holds in the different subgroups one can reason around this risk of composition effects. This is done in section 3.1.3 “Analysis on SOM-data”.¹³

1.3.4 Risk of homogeneity

Section 1.2 “Overview of the paper and its results” introduced the potential issue that trust beliefs are not heterogeneous which would argue that all individuals could be right simultaneously regarding their trust beliefs from an economic standpoint. For instance person A might indeed interact with many people that are not trustworthy and hence respond with a low level of trust in the ESS survey while person B is interacting with trustworthy people and hence respond with high levels of trust. One might argue that Person B would respond similarly to person A if they were interacting with the same person as Person A and vice versa. This could suggest homogenous beliefs. This concern is addressed in section 3.13. “Analysis on SOM data” where additional data for Sweden allows for an examination of trust-income relationships in different regions. Within regions people are likely to interact with circles of similar trustworthiness thus arguing that heterogeneously is unlikely to hold.¹⁴

¹³ Butler, Giuliano, Guiso. p.4

¹⁴ Butler, Giuliano, Guiso. p. 4

1.4 Risk of being cheated and its effect on trust and income

One of the mentioned downsides in trusting too much is a risk of being cheated. This is measured extensively in the previous paper. However, as there is only one ESS wave measuring cheating, this paper will not dive deep into the topic as it is not providing novel research. Even though the ESS does not allow us to examine a novel aspect of the trust-cheating relationship it can be valuable to understand how such a relationship could be proven empirically. Hence this paper provides a summarized section of the methodology from the previous paper.¹⁵

1.5 Structure of the paper

In order to make the examination of the individual trust income relationship as fluid as possible this paper will start by presenting the findings and relationships gathered with the updated data and then, in the discussion section directly compare the results to the previous paper. This is being further explained in the next sections, starting with the methodology of the data gathering which is later being analyzed in section 3. “Analysis”. The analysis section addresses all the issues mentioned in this background section which gives confidence in the fact that there is causation between trust and income. Furthermore the discussion section summarizes the key takeaways when comparing to the previous paper, such as the increased income premium, followed by a deep dive into where that increase comes from. This deep dive builds on a comparison of the low, medium and high trusting countries as well an analysis of the percentage of people in the different trust levels. In short the discussion section shows that the income premium increases for peak trust levels in all categories with the increase being the highest for high trusting countries. From an income premium of about 14% to an income premium of 18.3%. When looking at the movement of people between the trust levels there is a negative trend, indicating more people at lower trust levels, for low trusting countries while there is an opposite trend for both medium and high trusting countries. Apart from some more key takeaways the discussion section serves as a baseline for many potential comparisons that can be made. In order to leave that space open for the curious there is a deep dive table provided in the appendix. With the extensive discussion section this paper finally concludes that the trends from the previous paper have remained consistent and that there is a causation between trust and income.

¹⁵ Butler, Giuliano, Guiso. p. 20

2.Data & Methodology

2.1 The European Social survey

In order to study the relationship between performance and individual beliefs the European social survey is used. The ESS is a cross-sectional survey that is conducted in most part of the European union. Each two years a new wave is conducted. Data is used from 10 waves with the first being conducted 2002/2003 and the last being from 2020/2022, including information from 39 countries.. Pooling the data from the ESS Waves initially yields 490 555 observations. Out of these 132 361 are lost due missing data for the income or trust variable (26,98% of the original sample giving a restricted sample of 358 194 observations). Furthermore 108 404 observations (30,26% of the restricted sample) are lost due to missing data in other explanatory variables. One noteworthy observation is that nonresponse is unevenly distributed among countries. As long as the non-response is related to country fixed effects it should account for potential biases. However, to address this issue more formally a Heckman selection model is also applied. Explained in the empirical analysis section 4.1.¹⁶

2.1.1 Measuring trust

The ESS asks respondents the following question: “Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?”. Most comparable surveys with a similar question (such as the World Values Survey, the US General Social Survey, etc.) have max 3 response alternatives. ESS however asks respondents to respond on a scale from 0 to 10 where zero implies no trust at all and 10 implies that the individual believes that most individuals can be fully trusted. Thanks to this format it is actually possible to investigate whether the hump-shaped relationship holds in a detailed manner. Table A1-A4 in the appendix shows the same distributions as figure 1 did earlier. It’s noteworthy that the sample size across the countries can vary quite a lot. For Turkey the sample size is around 4000 respondents while Sweden and France have about 18 000 and 19 000 each. In order to get higher quality analysis with larger sample sizes these countries will be grouped with other countries with the most similar trust distributions which will form low, medium and high trusting country groups.

Expanding on these four tables one can see that the number of respondents is varying in other countries as well. The lowest number of respondents is in Romania, about 2000 and the highest is in Germany, above 34 000.¹⁷

¹⁶ European Social Survey, *ESS Data Portal*

¹⁷ European Social Survey, *ESS Data Portal*

2.1.2 Measuring performance

While being rich in several dimensions the ESS lacks extensive information on individuals income - a common trend for surveys focussing on values. Hence the best available indicator is household income which is also what the previous paper is using. Respondents are asked to fill in a letter that represents an income bracket. They are considered to report income from all sources including labor income and capital gain from investments. This is important as the hypothesis is that trust can affect all types of income. One might argue that capital gain is more affected by opportunistic behavior and varying trust beliefs than for instance labor income and the chance of getting a higher salary if one is more trustworthy. Even though one may find this to be something interesting to explore further, the ESS does not offer the required specifications for that. Hence the scope is testing the effect of trust beliefs on aggregated income.¹⁸

Furthermore the questions are answered in a way to account for country-specific conventions. Respondents can choose based on what they are used to when it comes to income period (monthly, weekly, annually) and report in their own currency. In order to ensure comparability all reportings are converted to an annular paying period and euros. The resulting brackets range up to above €200,000 (the largest net income decile for a certain country in a certain ESS round). In our analysis we identify each bracket with its midpoint. The highest income bracket is identified with its floor, coded according to country-specific data¹⁹

2.2 The SOM survey overview

This SOM section has already been referred to for addressing potential issues such as heterogeneity. The SOM survey is conducted by the SOM Institute of University of Gothenburg, studying Society, Opinion and Media. The survey collects information on politics, society, the use of media, public service, the environment, risks, new media technology, and leisure-time activities. The survey started in 1996 and similarly to the ESS it asks the respondents to rank general people's trustworthiness on a scale between 1-10. This is done by providing respondents with the following information:

In your opinion, to what extent can one trust people in general?" Choose values from 0 ("Cannot trust people in general") to 10 ("Can trust people in general.")

In this paper rounds from each year from 1996 to 2022 are used. The number of observations varies by wave, ranging from 1,779 in 1996 to 12,344 in 2022. Pooling data across waves yields 161,286 observations. From the original sample of 161,286, 40,320 observations are lost because of missing data for one or more explanatory variables (the restricted sample would be 120,966); an additional 14,785 observations (roughly 9% of the whole sample) are lost due to missing values in income. Our final reference sample consists of 106,181 observations.

¹⁸ European Social Survey, *ESS Data Portal*

¹⁹ Butler, Giuliano, Guiso. p.8

Performance is measured by the log of household income before taxes (this definition also includes study allowances and pensions), in brackets. Just as in the ESS analysis, the midpoint of each income bracket is used. Table A5 shows summary statistics for log income from the SOM data.

It's noteworthy that over 22 000 people (over 16%) answer 9 or 10 regarding trust which argues against that a potential hump shape would come from a niche group of people with unique characteristics.²⁰

²⁰ The SOM Institute, *The National SOM Survey Cumulative Dataset 1986-2022*, <https://snd.se/en/catalogue/dataset/snd0905-1> [retrieved 2024-04-17].

3. Analysis

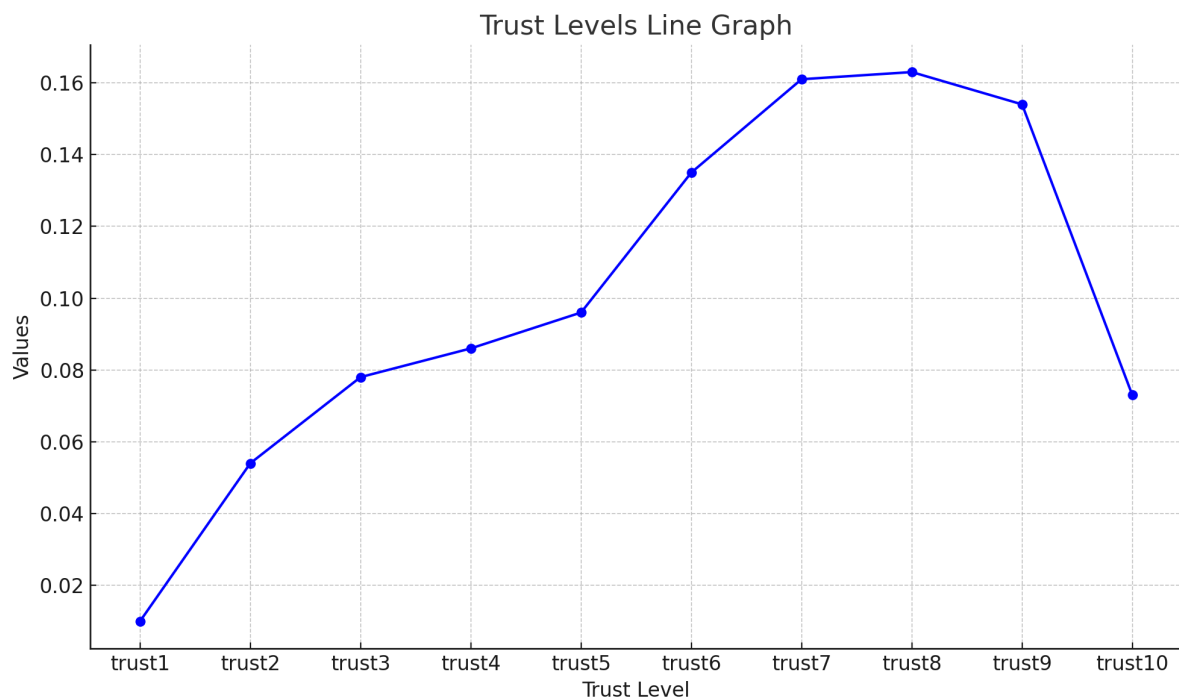
3.1 Empirical Analysis

The relationship between individual economic performance and individual trust is studied by estimating the following model in the pooled sample of the countries in the ESS:

$$y_{ic} = \sum_j \alpha_j Trust_{jic} + \beta X_{ic} + \delta C + \varepsilon_{ic}$$

In the model y_{ic} is the income (in logs) while X_{ic} represents a vector including individual countrolls. The effect of trust is captured through 10 dummies where the people reporting the lowest possible level zero are excluded. Furthermore, to control for the difference in average income across countries the vector C is inserted, controlling for systematic difference of average trustworthiness across countries.²¹ Below follows a trust-income relationship shown in column 1 in table 1.

Figure 3 - a graphical representation of the trust-income relationship in the ESS data



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As seen in the graph and stated in section 1.1, income peaks at 8 and starts declining afterwards. Explaining the graph and the conclusion from section 1.1 through this empirical framework the income at the peak of dummy8 is approximately 15% higher than the minimum value at dummy1. Furthermore the decrease from the peak (dummy8) to maximum amount of trust (dummy10) is about 9%. Section 1 also brought up that individuals with trust

²¹ Butler, Giuliano, Guiso. p. 11

²² European Social Survey, *ESS Data Portal*

levels within ± 1 of the optimal trust level (dummy7 to dummy9) fall within an interval of 0.9%. Furthermore table 1 below shows that all the dummies except dummy1 are significant with a 1% alpha level. This explains the section 1.1 conclusion (looking at ESS data) stating that a big deviation around the optimal level of trust can be quite costly while small deviation around the optimal level is not as big of a problem.

Table 1 - Relationship between trust and income in global ESS data

	(1) OLS	(2) Heckman	(3) OLS	(4) OLS	(5) OLS
Dependent variable: log(income)	Effect	Effect	Effect	Effect	Effect
Trust 1	0.010	0.014	0.013	0.008	0.009
	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)
Trust 2	0.054***	0.056***	0.052***	0.048***	0.052***
	(0.007)	(0.008)	(0.009)	(0.007)	(0.007)
Trust 3	0.078***	0.087***	0.078***	0.066***	0.076***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)
Trust 4	0.086***	0.094***	0.078***	0.069***	0.083***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)
Trust 5	0.096***	0.102***	0.090***	0.079***	0.094***
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)
Trust 6	0.135***	0.143***	0.129***	0.109***	0.132***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)
Trust 7	0.161***	0.166***	0.158***	0.130***	0.158***
	(0.006)	(0.007)	(0.008)	(0.007)	(0.006)
Trust 8	0.163***	0.164***	0.162***	0.127***	0.161***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)
Trust 9	0.154***	0.154***	0.159***	0.119***	0.152***
	(0.008)	(0.009)	(0.009)	(0.009)	(0.008)
Trust 10	0.073***	0.070***	0.080***	0.050***	0.073***
	(0.011)	(0.012)	(0.012)	(0.011)	(0.011)
Country fixed effects	yes	yes	yes	yes	yes
Individual controls	yes	yes	yes	yes	yes
Altruism, risk awareness, trustworthiness	yes	yes	yes	yes	yes
Additional controls	no	no	yes	no	no
Controlling for moderation	no	no	no	no	yes
Trust in legal system	no	no	no	yes	no
Constant	7.123***	7.918***	6.474***	7.086***	7.113***
	(0.032)	(0.023)	(0.114)	(0.032)	(0.032)
Observations	245,625	272,272	161,751	242,156	245,625
R-squared	0.685		0.726	0.684	0.685

Column 2-5 tests the robustness of some concerns reported this far. Firstly column 2 reports a Heckman selection model. This changes the optimal trust level to 7 and makes the drop in income higher than the other OLS regressions. However the hump-shaped relationship still holds.

Column 3 includes additional controls such as age dummies and controls for mother and fathers primary education. The maximizing income is now at a trust level of 8 while the general hump-shaped pattern still holds. Column 4 checks the possibility that general trust could be captured by trust in institutions and hence includes dummies for trust in the legal system. As seen in the numbers it does capture some of the effect, however the hump-shaped relationship is still clearly present with a 1% alpha level of all dummies between trust2 to trust10 (same as all the graphs). In the online appendix of the previous paper one can see more factors are tested such as trust in other institutions like trust in UN, trust in police, and trust in politicians, with the hump-shaped relationship remaining the same.²⁴ On this note another issue to address is the potential concern regarding people with extreme beliefs across multiple areas in life. These people may do worse than those with “normal” beliefs because of other factors than their trust beliefs. Many philosophers have reasoned around this topic of finding a balance with one example being the Chinese philosophy of yin and yang.²⁵ In order to address the risk of trust measures capturing other domains in life, column 5 includes a measure of risk aversion which doesn't change the hump-shaped relationship either.

A number of potential issues have been addressed by confirming a hump shaped relationship in a number of different scenarios, including different controls and measures. However, as highlighted in the background section there are more concerns to address. Below follows three issues and how they are addressed:

1. Another concern is the risk of the hump-shaped relationship being identified solely by individuals reporting 10 in trust which might be a small group of people with special characteristics. This is addressed in several ways. Firstly by an analysis on the ESS data split between low, medium and high trust countries. Secondly by comparing the characteristics of people with 10 in trust with the median person in a country and thirdly by diving deep in the SOM data set. In order for the issues to be addressed, firstly a hump shaped relationship would need to be present in both low, medium and high trust countries. Secondly the comparison between individuals with 10 in trust and the median person should conclude that there are no major differences in characteristics. Thirdly, the SOM data set should conclude that even in a country such

²⁴Butler Jeffrey V., Giuliano Paola, Guiso Luigi, *Online appendix*, (Journal of the European Economic Association: Volume 14, Issue 5 & online appendix from additional resources connected to pages 1155–1180, 2016), page 11

²⁵ Internet Encyclopedia of Philosophy, *Yinyang (Yin-yang)*, <https://iep.utm.edu/yinyang/> [retrived 2024-05-08]

as Sweden with high quality institutions and many people in the upper tail of the distribution there is an economic downside of trusting people too much.²⁶

2. Apart from the country fixed effect the model assumes that relationship with trust and income is the same for every individual within a country. This raises a concern as some individuals might be surrounded by more trustworthy people and thus have lower risk of trusting others. This issue refers to the heterogeneity issue mentioned in the background section and is mainly addressed by analyzing the SOM dataset that reports more detailed Swedish data. For instance it reports data per region which makes it more logical to assume that individuals within the same region interact with people of the same level of trustworthiness. If a hump-shaped relationship holds in all regions this would assist in addressing this concern.
3. The third concern lies within reverse causality. The main method to address the reverse causality issue lies in confirming the hump-shaped method and addressing potential scenarios where income could imply a hump-shaped trust relationship rather than vice versa. Such a scenario builds on two assumptions. It is correct and well known across the population that the optimal trust level is affected by the general trustworthiness of the populations. Secondly, that income would give individuals access to better tools for predicting others' trustworthiness which would help them to adjust accordingly. To address this issue two regressions are conducted. The first regression is regressing income on variance of trust and the second regression is regressing trust on variance of income. In order to exclude the risk of the hump-shape being caused by income, a scenario with no clear significant negative relationship in the first regression, combined with a positive significant relationship in the second regression, should be present.²⁷

3.1.1 High trust, medium and low trust countries

The grouping has been done by categorizing all 39 countries based on their average trust and ranking them from highest to lowest trust. Then the ranked countries have been divided into three groups. This method may lead to a situation with similarities between the countries on either side of each border between groups. However it will remove the risk of very low and very high trust countries such as Turkey and Sweden being grouped together. The different groups are:

High trust countries (right tail distribution):

Including Luxembourg, Israel, Austria, United Kingdom, Ireland, Estonia, Switzerland, Netherlands, Sweden, Iceland, Finland, Norway and Denmark.

Medium trust countries (almost symmetrical distribution around 5):

Including Cyprus, Slovenia, Croatia, Hungary, France, Russia, Ukraine, Germany, Czech Republic, Spain, Lithuania, Italy and Belgium.

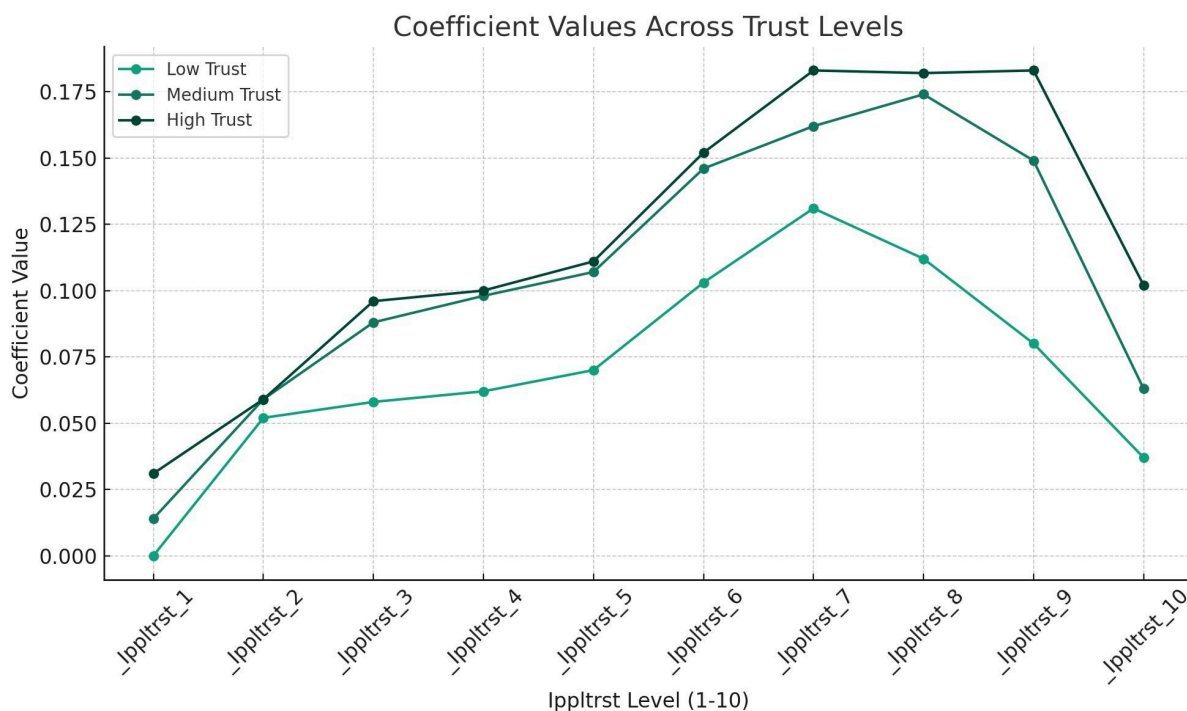
²⁶ Butler, Giuliano, Guiso. p. 16

²⁷ Butler, Giuliano, Guiso. p. 14

Low trust countries including (left tail distribution):

Turkey, Albania, North Macedonia, Bulgaria, Serbia, Kosovo, Montenegro, Romania, Portugal, Poland, Latvia, Greece and Slovakia.

Figure 4 - Relationship between trust and income in Low, High, and medium trust country groups



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To address the issue of a hump-shape arising only because of individuals with 10 in trust beliefs, with potential special characteristics, three separate regressions are run for the different groups of low, medium and high trusting countries. Firstly one can see that a hump-shaped relationship is present in all three regressions. Secondly one can see that the hump-shape for medium and low trusting countries is not solely identified by the individuals with 10 in trust. This gives credit to the model presented in section 1.1 “Empirical model - Individual trust and Economic performance” assuming that the optimal trust level in a country is dependent on the general trustworthiness of a country. In order to further dive into this topic the next section is looking at Sweden, a high trusting country where the hump-shape comes from individuals reporting 10 in trust.²⁹

3.1.2 Comparing individuals with 10 in trust to the median person

The table above compares the difference in means from the median person to the persons with 10 in trust beliefs.

²⁸ European Social Survey, *ESS Data Portal*

²⁹ The SOM Institute, *The National SOM Survey Cumulative Dataset 1986-2022*

Table 2 - Comparing individuals with 10 in trust to the median person

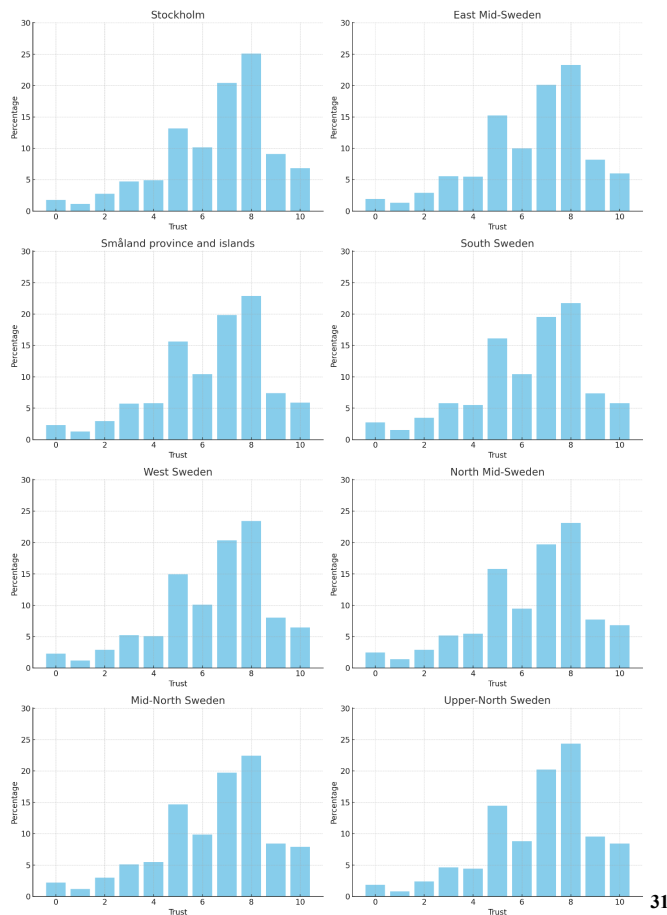
Characteristic	Difference in Means	P-value
Age	5.8598	3.1e-174
Male	-0.0337	2.61e-07
Immigrant	0.0285	1.02e-28
Married	-0.0025	0.8987
Fprimary	0.0371	1.38e-09
Unemployed	-0.0038	0.00131
Years of education	-0.2805	0.0008596
Big city	0.004	0.8306
Small city	-0.0139	0.2282
Risk aversion	0.0046	0.932
Trustworthiness	0.4201	3.44e-17

30

The difference in trust from marriage and unemployment are shown to be small and the same goes with the rest of the variables. Worth to consider is that some of the variables such as the married and risk aversion variable have very high p-values which question their explanation power. However a conclusion here is that the only significant variable with significant difference in means is age. People with 10 are around 5,9 years older than the median person. Although this is a difference, age dummies were already included in table 1 in column 3 where a clear hump-shape was present.

3.1.3 Analysis on SOM-data

Figure 5 - Trust level distribution in different regions in Sweden



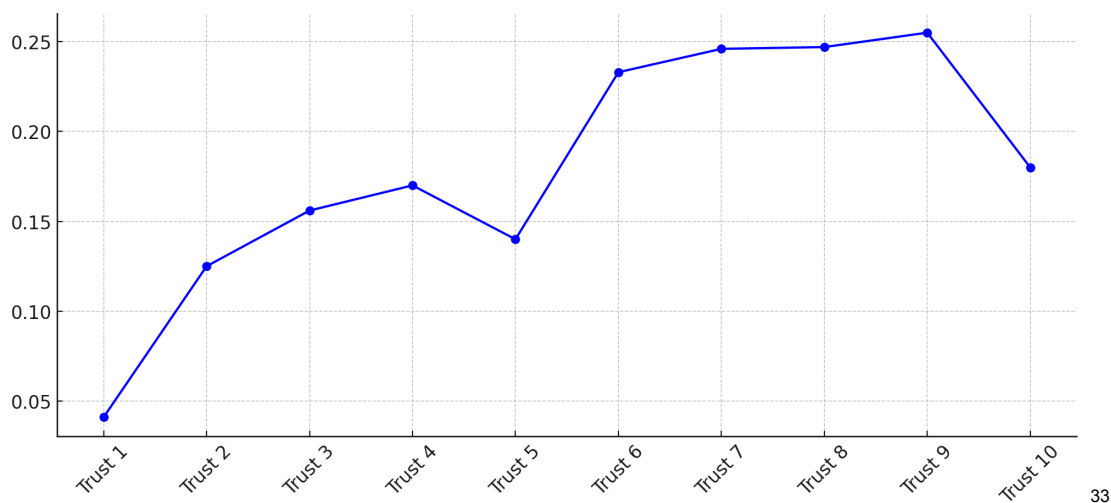
31

Diving deeper into Sweden and the SOM datasets yields three main benefits. Firstly, the high number of individuals in the right tail of the distributions provides even more evidence that high trusting individuals seem to have characteristics that are similar to the median person's. Secondly this data supports that there is an economical downside of trusting too much, even in a country with high quality institutions. Thirdly it addresses the issue of composition effect as Sweden, as shown in figure 4, has a homogenous trust belief distribution across different regions, in that that trust distribution doesn't differ much between these different regions. These three points, given that a consistent hump-shape pattern is present, gives further confidence to the hypothesis that there is an optimal level of trust. The table below presents the regression on income overtrust using the SOM dataset's data.³²

³¹ The SOM Institute, *The National SOM Survey Cumulative Dataset 1986-2022*

³² The SOM Institute, *The National SOM Survey Cumulative Dataset 1986-2022*

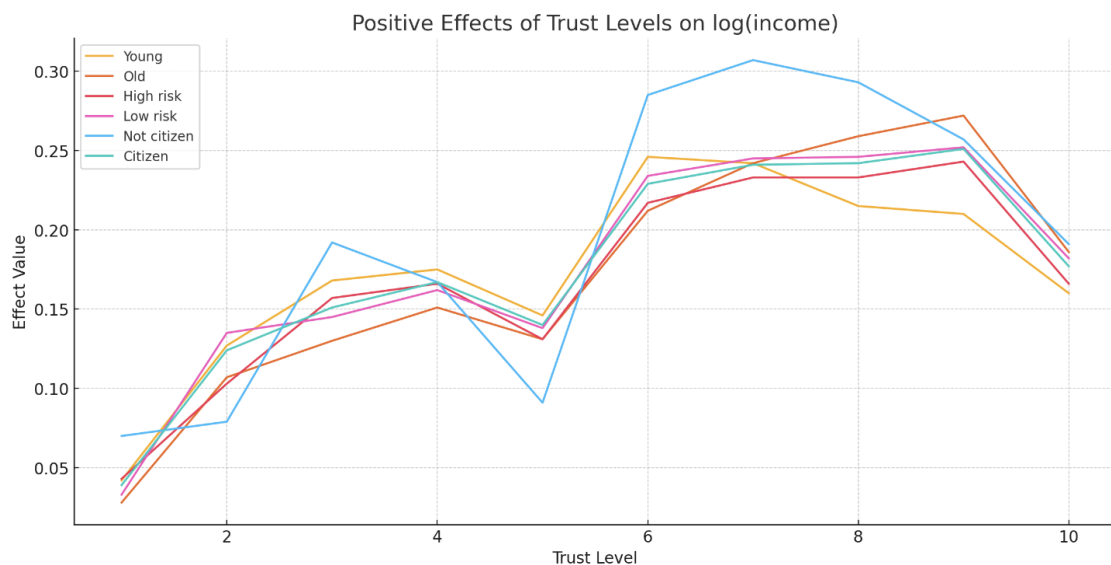
Figure 6 - Relationship between trust and income in SOM data



33

The table still provides a hump-shape, although the drop at the highest trust level isn't as steep as it is in the ESS regressions. The peak income seems to be pretty consistent around trust levels of 6-9 with a slight peak at 9. Going from no trust to optimal level of trust has a difference of over 25% compared to around 16% in the ESS data. The decline from optimal trust to maximum trust is roughly 7,5% income decrease which is a bit lower than in the aggregated ESS regression in table 1 column 1. This implies that individuals in Sweden have less downside of trusting others to much. Diving deeper into the risk of composition effects figure 6 below addresses this issue by splitting the sample into different characteristics:

Figure 7 - Relationship between trust and income in SOM data, sample split across certain observables



34

As seen in the table there seems to be a consistency in the hump-shape across the different characteristics. For exact numbers and significance see A13 in the online appendix. This

³³ The SOM Institute, *The National SOM Survey Cumulative Dataset 1986-2022*

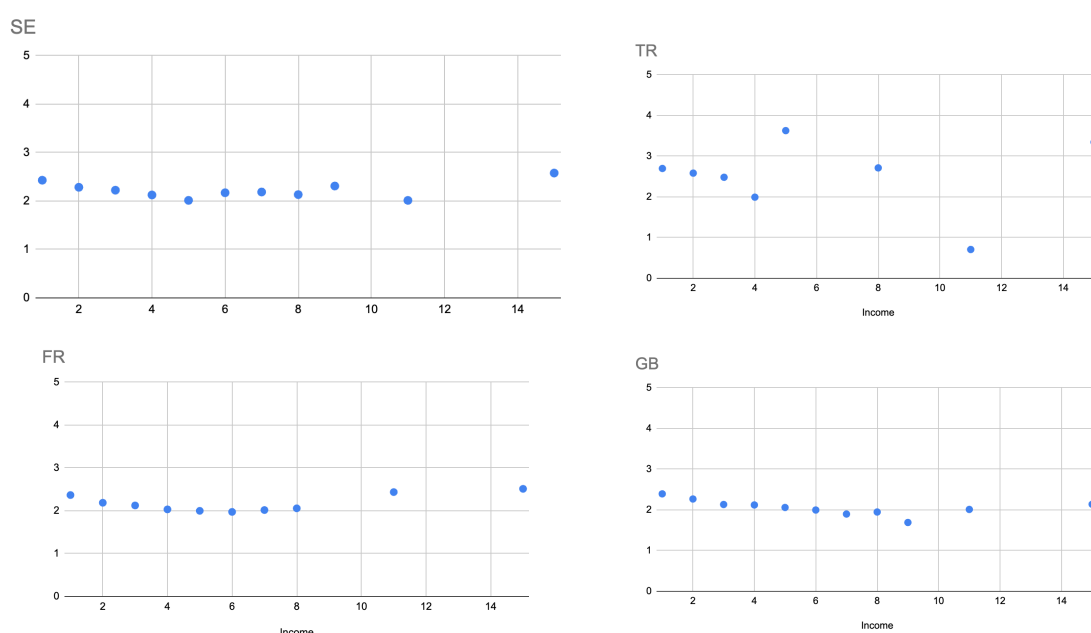
³⁴ The SOM Institute, *The National SOM Survey Cumulative Dataset 1986-2022*

gives confidence that regardless of composition effects there seem to be an independent relationship between trust and income. In the previous paper the authors included even more controls than the ones presented above such as risk aversion, religiosity, entrepreneur and so on. When looking at table A12 there is no significance across all parameters which still gives some doubt. However, out of all characteristics, there is no significant trend that is proving the hump-shaped relationship to be wrong.

3.1.4 The risk income causing the hump-shaped trust relationship

The tables below showcase a regression of income and the standard deviation of trust. As seen in the tables some values of standard deviation for certain income brackets are missing. This is explained by the standardized income brackets used not lining up perfectly with the country specific income deciles ESS collects income data through.

Figure 8 - Trust's standard deviation at each income level in ESS data, sample split by country



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One of the main concerns previously outlined is that income could give individuals better tools to predict general trustworthiness of a population and hence mechanically create a hump-shaped relationship that is dependent on the general trustworthiness of a country. If this would be true one would expect a clear negative relationship between the income and standard deviation of trust such as that higher income would lead to more precise estimations of the general trustworthiness of a country and thus lower standard deviation in individual trust beliefs. However this is not present from the graphs above. Rather the relationship is quite ambiguous which implies that there is no evidence for this argument of reverse causality.

Going back to the main hypothesis that trust instead is the variable affecting income one would expect that increased trust would simultaneously lead to an increase of profitable opportunities and an increase in the exposure of the risk of being cheated. This would imply that the spread of income should also become higher and that there should be a positive relationship between trust and the standard deviation of income. When testing for this we indeed find a positive relationship between trust and standard deviation that is significant with a 1% alpha level and also provides a meaningful difference (See table A9 in appendix). This combined gives further confidence in rejecting the possibility of reverse causality.

3.2 Cheating

As the paper has indicated this far it can both be costly to trust too much and too little. Trusting to little is leading to missed opportunities while trusting too much leads to increased risk of being cheated. While missed opportunities are hard to quantify as they are generally unobservable the risk of being cheated can be measured. The cheating measure is included in one of the ESS waves by looking at the frequency of how many times an individual has been cheated within four different domains during the last 5 years previous to the ESS survey. The domains and the questions/statements asked follow below:

1. For bank/insurance companies: A bank or insurance company failed to offer you the best deal you were entitled to.
2. For second hand sellers: You were sold something second-hand that quickly proved to be faulty.
3. For grocers and/or food sellers: You were sold food that was packed to conceal the worse bits.
4. For plumbers and/or builders: A plumber, builder, car mechanic, or other repair person overcharged you or did unnecessary work.

Respondents can answer between numbers 0 to 4 meaning the following:

- 0: have never been cheated
- 1: Have been cheated once
- 2: Have been cheated twice
- 3: Have been cheated three or four times
- 4: Have been cheated five times or more

Furthermore the following empirical framework is used:

$$Z_{ic}^d = \alpha Trust_{ic} + \beta X_{ic} + \gamma C + \varepsilon_{ic}$$

- Z_{ic}^d : A summary of how many times individuals have been cheated in country C in domain d.
- The rest of the variables have the same meaning as the variables in section 3.1 “Empirical Analysis” except that trust is instrumented and used as a single variable rather than a set of dummies.

When firstly regressing trust and cheating there will be a negative relationship. This negative relationship is explained by people that have been cheated and adjust their trust beliefs downwards. This negative relationship gives no explanatory value to the increased risk of getting cheated by having higher trust. In order to capture that effect the aim is to regress inherited trust with the frequency of being cheated. Creating an IV variable for inherited trust is complicated and risks being affected by omitted variable bias. In the original paper there is a long discussion about potential issues and ways to arrive at the correct IV. As cheating is not a major part of the analysis in this paper that discussion is left out. The result after the discussion is an IV variable representing a measure of how much responsibility is delegated to individuals by their supervisors at their workplace. Without diving into specifics about definitions the regressions yields the following table³⁶:

Table 3 - Trust and cheating from previous paper

	(1) Bank insurance	(2) Second-hand things	(3) Food	(4) Plumber, builder, mechanic, repairer	(5) Times being cheated (sum)	(6) Being cheated (principal component)
PANEL A: Second stage						
Trust	0.750*** (0.196)	0.227** (0.095)	0.589*** (0.193)	0.556*** (0.163)	2.139*** (0.557)	1.098*** (0.285)
Observations	23,350	24,923	25,338	24,740	21,930	21,930
	(1) Trust	(2) Trust	(3) Trust	(4) Trust	(5) Trust	(6) Trust
PANEL B: First stage						
Trustworthiness	0.0084*** (0.0018)	0.0078*** (0.0017)	0.0079*** (0.0017)	0.0082*** (0.0017)	0.0089*** (0.0018)	0.0089*** (0.0018)
Observations	23,350	24,923	25,338	24,740	21,930	21,930
F-stat	21.95	20.10	21.10	22.39	22.98	22.98
	(1) Bank insurance	(2) Second-hand things	(3) Food	(4) Plumber, builder, mechanic, repairer	(5) Times being cheated (sum)	(6) Being cheated (principal component)
PANEL C: Reduced form						
Trustworthiness	0.006*** (0.001)	0.002*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.019*** (0.002)	0.010*** (0.001)
Observations	23,377	24,957	25,370	24,772	21,951	21,951
R-squared	0.09	0.08	0.11	0.06	0.12	0.12

Notes: Each regression controls for a quadratic in age, gender, immigrant, marital and labor market status, years of education, education of the father, income, dummies for city size, a measure of risk aversion, eight occupational dummies and country fixed effects. Trust is the answer to the following question: "Generally speaking would you say that most people can be trusted or that you can't be too careful in dealing with people? Please tell me on a score of 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted". Trust is instrumented using the variable Trustworthiness obtained as the sum of the answers to the following three questions: "I am going to read out a list of things about your working life. Using this card, please say how much the management at your work allows/allowed you to (1) decide how your own daily work is/was organized; (2) influence policy decisions about the activities of the organization? (3) to choose or change your pace of work?" The answer to each question can take values from 0 (I have/had no influence) to 10 (I have/had complete control).

***Significant at 1%; **significant at 5%.

³⁶Butler, Giuliano, Guiso. p. 23

³⁷ Butler, Giuliano, Guiso. p.24

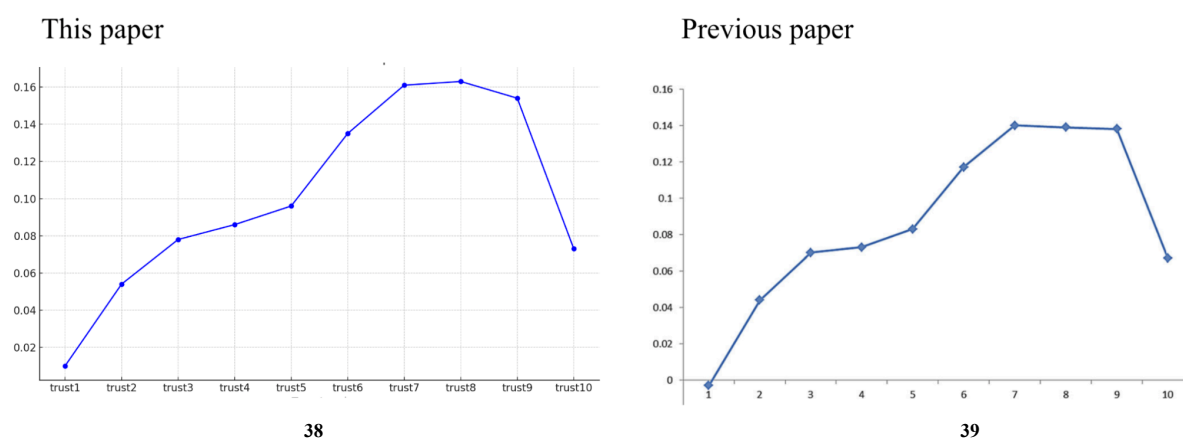
4. Discussion

This discussion section will serve as a summary of the most important takeaways as well as a catalyst for a further discussion that can take many different paths and go into details of many tables. In order to allow for such a deep dive it will provide a link to an online appendix where all regressions from this paper and the previous paper are summarized and visualized.

4.1 Main takeaways from previous study

Starting off with some obvious differences the sample sizes have increased both when it comes to the ESS and SOM data. Furthermore the number of countries has increased from 32 to 39 countries in ESS. Moving further from the practical numbers it is important to mention that the indications supporting the hump shaped relationship and arguing against reverse causality have remained consistent. With this said and with confidence in that there seems to be a significant causation between trust and income the section will move further the most important aspect - the difference in trust-income relationship. In order to do this in a coherent manner the graphs below will provide a visual representation of the difference in the trust-income relationship in our data compared to the previous paper's data.

Figure 9 - Comparison between our new results (Figure 2) and previous paper's results - Relationship between trust (x-axis) and income (y-axis) in global ESS data

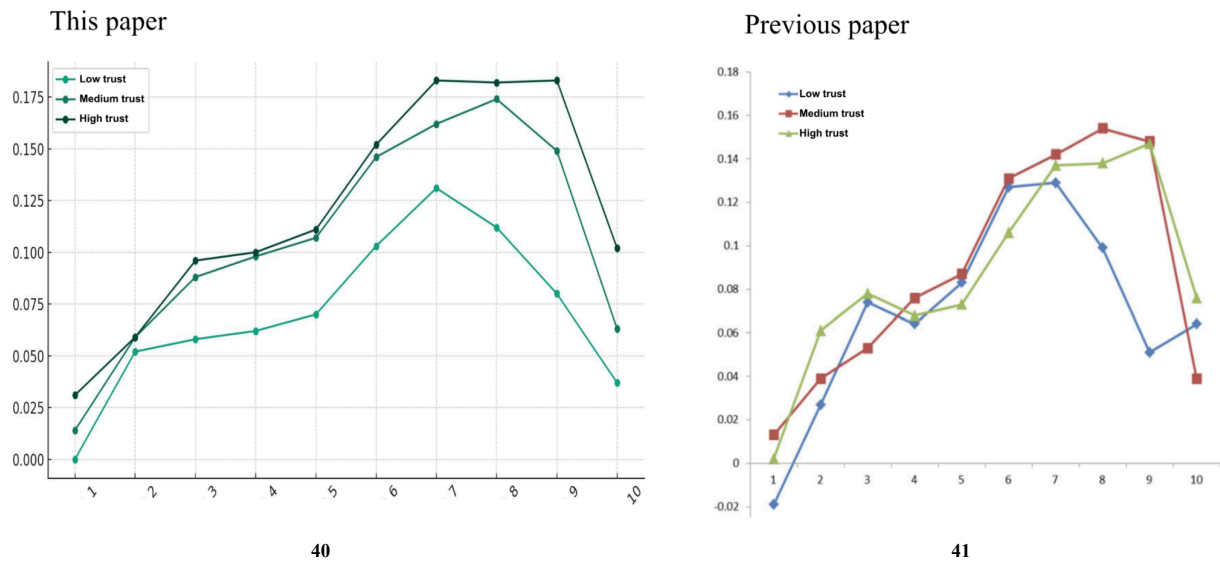


The hump-shape is consistent but the optimal trust level has increased from 7 to 8 and furthermore the income premium from zero trust to optimal level of trust have increased from 14% to 16%. In order to deepen this analysis it is relevant to investigate from which countries this increase is driven. In order to analyze that the difference between the previous paper's regressions and our regressions regarding the low, medium and high trusting countries a graphical comparison is presented below:

³⁸ European Social Survey, *ESS Data Portal*

³⁹ Butler, Giuliano, Guiso. p.13

Figure 10 - Comparison between our new results (Figure 3) and previous paper's results - Relationship between trust (x-axis) and income (y-axis) in Low, High, and medium trust country groups

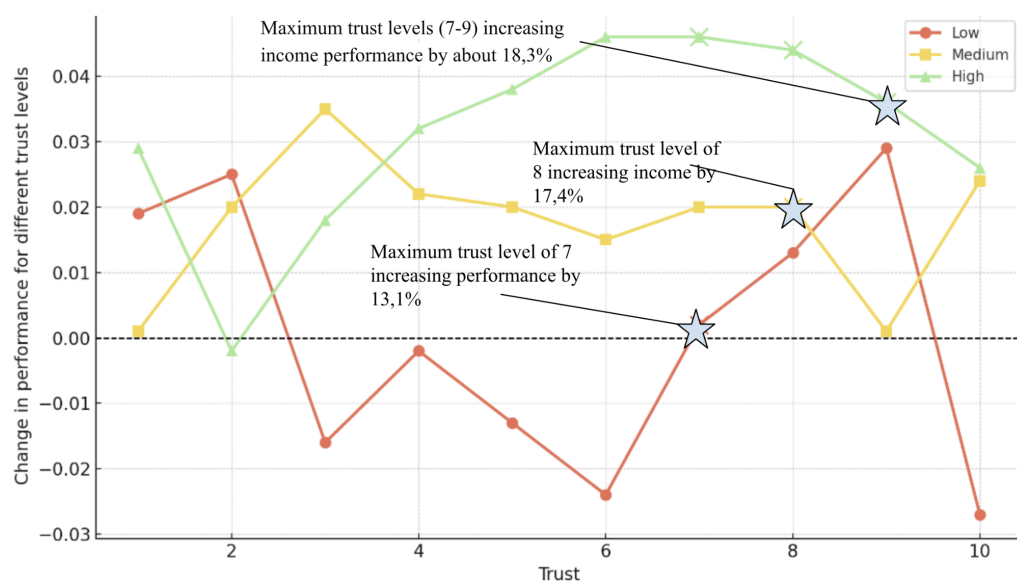


A noteworthy observation is that the peak trust from high trusting countries have flattened between 7-9 and the maximum income increase now comes from a high trusting country rather than a medium trusting country as it was before. Furthermore the increase from 9 to 10 presented in the low trusting countries previously is no longer present. Similarly to before the hump-shape relationship is driven by several data points for the low trusting countries while it is only driven by the decrease from 9 to 10 in trust when it comes to the high trusting countries. Diving deeper into the specific differences, the graph below visualizes how the effect in performance has changed for low, medium and high trusting countries compared to the previous thesis.

⁴⁰ European Social Survey, *ESS Data Portal*

⁴¹ Butler, Giuliano, Guiso. p.16

Figure 11 - Difference in income premium between this and the previous paper



★ Old max

42

Firstly the peak trust levels remain quite similar except that the peak has flattened out for high trusting countries. Furthermore the income premium has increased for all groups of countries. The increase is highest for the high trusting countries where the income premium has increased above 4% implicating that an optimal level of trust compared to zero trust now yields around 18,3% increase in income compared to previously of slightly above 14%. Furthermore the income premium has increased for all trust levels when it comes to medium and high trusting countries while the results are a bit different for low trusting countries. For low trusting countries the income premium has decreased for trust between 3-6 as well as for ten in trust while it has increased for all other trust levels. In order to deepen the discussion the table below visualizes the change in frequencies of people with different trust levels for different groups of countries.

Table 4 - Difference in percentage points for trust frequencies in low, medium and high trusting countries between this and the previous paper

Trust Level	Low Trust Country (% Change)	Medium Trust Country (% Change)	High Trust Country (% Change)
0	1.90%	-0.35%	0.02%
1	-1.28%	-0.87%	-0.11%
2	-0.39%	-0.67%	0.06%
3	-0.36%	-0.66%	-0.17%
4	-0.22%	-0.17%	-0.29%
5	0.01%	-0.54%	-0.63%
6	0.21%	1.07%	0.30%
7	-0.95%	1.33%	0.63%
8	-0.07%	0.74%	0.28%
9	-0.08%	0.05%	-0.02%
10	0.25%	0.09%	-0.08% ⁴³

The table shows movements of trust beliefs across the different categories. Firstly with the low trusting countries the greatest movement seems to be that people with trust beliefs between 1-5 have moved downwards with a significant increase of 1,9 percentage points when it comes to people with zero trust. Furthermore a decrease of almost 1% of people reporting 7 have been divided into an increased amount of people reporting 10 and 6 in trust. When it comes to the medium and high trusting countries there seems to be a consistent movement where trust beliefs are increasing, especially between 6-8 in trust. This trend is even stronger in the medium trusting countries. One potential explanation, that would need to further investigation, is that people in all country groups have adjusted their trust beliefs to the general trustworthiness of their population. As mentioned in the beginning of the discussion section this part could take several paths. To allow for further investigation all the regressions from this and the previous paper are gathered in a newly constructed online appendix (Deep dive A1 in the appendix section).

⁴³ The table is comparing frequencies from ESS round 0-5 and ESS round 0-10 which imply that the actual difference (change from ESS round 0-5 & ESS round 6-10) is higher.

5. Conclusion

This paper started with a background section providing some history about the research topic as well as an outline for the thesis. Furthermore it continued with a section deep diving in the data and the methodology before that section was later analyzed during the empirical analysis. Several concerns were outlined in the first two parts and handled in the third part. The discussion section showed that there was no specific evidence that would question the hump shaped relationship nor argue for reverse causality. This structured approach gave confidence that there is a causation between trust and income in a way where an optimal amount of trust exists. The optimal level had increased as well as the income premium. Also when breaking down into low, medium and high trusting countries all categories are experiencing an increased income premium. While the discussion section also opened for many more paths of comparison the main conclusion is that this paper confirms and strengthens the obtained results in the previous papers.

6. Reference list

The methodology of this paper is inspired by The Right Amount of Trust paper, referred to as the old paper. This implies that the majority of this paper is using the old paper as a source.⁴⁴ The complete reference list follows below:

Arrow Kenneth, Gifts and Exchanges, (Philosophy and Public Affairs: 1 & pages 343–362, 1972)

Butler Jeffrey V., Giuliano Paola, Guiso Luigi, The Right Amount of Trust, (Journal of the European Economic Association: Volume 14, Issue 5 & Pages 1155–1180, 2016)

European Social Survey, ESS Data Portal, <https://ess.sikt.no/en/?tab=overview> [retrieved 2024-04-05].

Statista, National pre-tax income distribution for European countries in 2021, by income percentile, <https://www.statista.com/statistics/1413341/inequality-income-distribution-europe/#:~:text=On%20average%2C%20the%20top%2010,earned%20less%20than%20a%20fifth> [retrived 2024-05-07].

The SOM Institute, The National SOM Survey Cumulative Dataset 1986-2022, <https://snd.se/en/catalogue/dataset/snd0905-1> [retrieved 2024-04-17].

Internet Encyclopedia of Philosophy, Yinyang (Yin-yang), <https://iep.utm.edu/yinyang/> [retrived 2024-05-08]

⁴⁴ This is explained in the background section as well as outlined in the key words

7. AI-appendix

The generative AI service ChatGPT was used for the following purposes:

- Code debugging
- Writing initial drafts of parts of our code
- Finding potential grammatical errors in our text

When letting the AI help us out with these aspects of the coding, we prioritized making sure we could understand whatever advice or code the AI suggested to us. This is important for us to be able to ensure high quality and accuracy of the code and its output. Otherwise there would have been a risk that the AI would have misinterpreted our request or written faulty code. Our usage of AI helped us write better code more efficiently, as well as getting a broader understanding of Stata programming as seeing ChatGPT's suggested code taught us about Stata functions and similar that were new to us.

In terms of the AI helping us point out potential grammatical errors, it's important to note that AI models can hallucinate and we thus decided not to depend solely on its assessments. Taking help from AI in this way helped us ensure a lower risk of grammatical errors.

8. Appendix

Table A1 - Global trust distribution

Trust Level	Frequency	Percent	Cumulative Percent
0	32,992	6.75%	6.75%
1	21,006	4.30%	11.05%
2	34,881	7.14%	18.19%
3	50,673	10.37%	28.56%
4	45,902	9.39%	37.95%
5	96,657	19.78%	57.73%
6	52,360	10.72%	68.45%
7	72,366	14.81%	83.26%
8	56,201	11.50%	94.76%
9	15,319	3.14%	97.90%
10	10,284	2.10%	100.00%
Total	488,641	100.00%	

⁴⁵

Table A2 - France trust distribution

Trust Level	Frequency	Percent	Cumulative Percent
0	1,240	6.52%	6.52%
1	612	3.22%	9.74%
2	1,575	8.28%	18.02%
3	2,364	12.43%	30.45%
4	2,294	12.06%	42.51%
5	5,238	27.54%	70.04%
6	2,096	11.02%	81.06%
7	2,114	11.11%	92.18%
8	1,109	5.83%	98.01%
9	231	1.21%	99.22%
10	148	0.78%	100.00%
Total	19,021	100.00%	

⁴⁶

⁴⁵ European Social Survey, *ESS Data Portal*

⁴⁶ European Social Survey, *ESS Data Portal*

Table A3 - Swedish trust distribution

Trust Level	Frequency	Percent	Cumulative Percent
0	421	2.32	2.32
1	239	1.32	3.64
2	590	3.25	6.89
3	1,213	6.68	13.57
4	1,242	6.84	20.41
5	2,949	16.24	36.65
6	1,951	10.75	47.4
7	4,100	22.58	69.98
8	3,790	20.88	90.86
9	1,111	6.12	96.98
10	548	3.02	100
Total	18,154	100	

47

Table A4 - Turkish trust distributions

Trust Level	Frequency	Percent	Cumulative Percent
0	1,297	30.50%	30.50%
1	760	17.87%	48.37%
2	413	9.71%	58.08%
3	375	8.82%	66.89%
4	256	6.02%	72.91%
5	544	12.79%	85.70%
6	161	3.79%	89.49%
7	169	3.97%	93.46%
8	136	3.20%	96.66%
9	45	1.06%	97.72%
10	97	2.28%	100.00%
Total	4,253	100.00%	

48

⁴⁷ European Social Survey, *ESS Data Portal*

⁴⁸ European Social Survey, *ESS Data Portal*

Table A5 - Relationship between trust and income in SOM data

Dependent variable: log(income)	(1)	(2)
Trust 1	0.041 (0.025)	
Trust 2	0.125*** (0.02)	
Trust 3	0.156*** (0.018)	
Trust 4	0.170*** (0.018)	
Trust 5	0.140*** (0.017)	
Trust 6	0.233*** (0.017)	
Trust 7	0.246*** (0.017)	
Trust 8	0.247*** (0.017)	
Trust 9	0.255*** (0.017)	
Trust 10	0.180*** (0.017)	
Trust		-0.001 (0.002)
Trust squared		0.030*** (0.002)
Constant	12.467*** (0.026)	12.584*** -0.033
Observations	114,538	47,955
R-squared	0.339	0.373

49

Table A6 - Distribution of trust in SOM data

Trust Level	Frequency	Percent	Cumulative
0	3,387	2.17%	2.17%
1	1,938	1.24%	3.42%
2	4,546	2.92%	6.34%
3	8,221	5.28%	11.61%
4	8,173	5.25%	16.86%
5	23,067	14.80%	31.66%
6	15,754	10.11%	41.77%
7	31,476	20.20%	61.97%
8	36,478	23.41%	85.38%
9	12,717	8.16%	93.54%
10	10,058	6.46%	100.00%
Total	155,815	100.00%	-

50

Table A7 - OLS regressions of relationship between trust and income in global ESS data

	(1) OLS	(3) OLS	(4) OLS	(5) OLS
Dependent variable: log(income)	Effect	Effect	Effect	Effect
Trust 1	0.010 (0.009)	0.013 (0.010)	0.008 (0.009)	0.009 (0.009)
Trust 2	0.054*** (0.007)	0.052*** (0.009)	0.048*** (0.007)	0.052*** (0.007)
Trust 3	0.078*** (0.007)	0.078*** (0.008)	0.066*** (0.007)	0.076*** (0.007)
Trust 4	0.086*** (0.007)	0.078*** (0.008)	0.069*** (0.007)	0.083*** (0.007)
Trust 5	0.096*** (0.006)	0.090*** (0.007)	0.079*** (0.006)	0.094*** (0.006)
Trust 6	0.135*** (0.007)	0.129*** (0.008)	0.109*** (0.007)	0.132*** (0.007)
Trust 7	0.161*** (0.006)	0.158*** (0.008)	0.130*** (0.007)	0.158*** (0.006)
Trust 8	0.163***	0.162***	0.127***	0.161***

	(0.007)	(0.008)	(0.007)	(0.007)
Trust 9	0.154***	0.159***	0.119***	0.152***
	(0.008)	(0.009)	(0.009)	(0.008)
Trust 10	0.073***	0.080***	0.050***	0.073***
	(0.011)	(0.012)	(0.011)	(0.011)
Male	0.052***	0.020***	0.050***	0.051***
	(0.002)	(0.003)	(0.002)	(0.002)
Immigrant	-0.114***	-0.104***	-0.114***	-0.113***
	(0.004)	(0.005)	(0.004)	(0.004)
Married	0.372***	0.182***	0.370***	0.371***
	(0.003)	(0.004)	(0.003)	(0.003)
Father primary education	-0.076***	-0.035***	-0.076***	-0.076***
	(0.003)	(0.004)	(0.003)	(0.003)
Unemployed	-0.527***	-0.498***	-0.522***	-0.526***
	(0.007)	(0.008)	(0.007)	(0.007)
Out of labor force	-0.183***	-0.145***	-0.183***	-0.183***
	(0.003)	(0.003)	(0.003)	(0.003)
Years of education	0.033***	0.054***	0.032***	0.033***
	(0.000)	(0.010)	(0.000)	(0.000)
Big city	0.062***	0.102***	0.060***	0.062***
	(0.003)	(0.003)	(0.003)	(0.003)
Small city	0.011***	0.039***	0.010***	0.011***
	(0.003)	(0.003)	(0.003)	(0.003)
Risk tolerance	0.008***	0.008***	0.008***	
	(0.001)	(0.001)	(0.001)	
Altruism	0.011***	0.009***	0.011***	0.012***
	(0.001)	(0.002)	(0.001)	(0.001)
Trustworthiness	0.012***	0.010***	0.012***	0.012***
	(0.000)	(0.000)	(0.000)	(0.000)
Years of education		-		
		(0.015)		
Mother primary education		-0.052***		
		(0.004)		

Partner primary education		-0.147***		
		(0.006)		
Number of household members		0.047***		
		(0.001)		
Age	-0.005***		-0.005***	-0.006***
	(0.000)		(0.000)	(0.000)
Age squared	-0.000***		-0.000***	-0.000***
	(0.000)		(0.000)	(0.000)
Trust in legal 1			0.025***	
			(0.008)	
Trust in legal 2			0.052***	
			(0.007)	
Trust in legal 3			0.061***	
			(0.006)	
Trust in legal 4			0.075***	
			(0.007)	
Trust in legal 5			0.070***	
			(0.006)	
Trust in legal 6			0.108***	
			(0.006)	
Trust in legal 7			0.123***	
			(0.006)	
Trust in legal 8			0.141***	
			(0.006)	
Trust in legal 9			0.158***	
			(0.007)	
Trust in legal 10			0.095***	
			(0.009)	
Risk tolerance 2				0.034***
				(0.004)
Risk tolerance 3				0.051***
				(0.004)

Risk tolerance 4				0.050***
				(0.004)
Risk tolerance 5				0.049***
				(0.005)
Risk tolerance 6				0.041***
				(0.007)
Age dummies		Yes		
Country dummies	Yes	Yes	Yes	Yes
Education dummies x Country dummies		Yes		
Constant	7.123***	6.474***	7.086***	7.113***
	(0.032)	(0.114)	(0.032)	(0.032)
Observations	245,625	161,751	242,156	245,625
R-squared	0.685	0.726	0.684	0.685

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Table A8 - Heckman regression of relationship between trust and income in global ESS data

Dependent variable: log(income)	Outcome Effect	Selection Effect
Trust 1	0.014 (0.009)	-0.01 (0.017)
Trust 2	0.056*** (0.008)	0.040*** (0.015)
Trust 3	0.087*** (0.007)	0.064*** (0.014)
Trust 4	0.094*** (0.007)	0.071*** (0.015)
Trust 5	0.102*** (0.007)	0.053*** (0.013)
Trust 6	0.143*** (0.007)	0.111*** (0.015)
Trust 7	0.166*** (0.007)	0.126*** (0.014)
Trust 8	0.164*** (0.007)	0.161*** (0.015)
Trust 9	0.154*** (0.009)	0.129*** (0.021)
Trust 10	0.070*** (0.012)	0.083*** (0.025)
Age	-0.004*** (0)	0.021*** (0.001)
Age squared	-0.000*** (0)	-0.000*** (0)
Male	0.051*** (0.003)	0.060*** (0.006)
Immigrant	-0.124*** (0.005)	0.014 (0.011)
Married	0.378*** (0.003)	-0.019*** (0.006)
Father primary education	-0.079***	0.067***

	(0.003)	(0.008)
Unemployed	-0.526***	-0.051***
	(0.007)	(0.013)
Out of labor force	-0.184***	0.048***
	(0.003)	(0.007)
Years of Education	0.034***	0.006***
	(0)	(0.001)
Big city	0.061***	0.039***
	(0.003)	(0.007)
Small city	0.010***	0.033***
	(0.003)	(0.007)
Risk tolerance	0.007***	-0.019***
	(0.001)	(0.002)
Altruism	0.009***	0.008**
	(0.002)	(0.003)
Trustworthiness	0.011***	0.002***
	(0)	(0)
Distance from filing taxes month		0.001
		(0.001)
Country dummies	Yes	
Constant	7.918***	0.780***
	(0.023)	(0.052)
Observations	272,272	272,272

* $\rho = 0.034^{***}(-0.003)$, $\sigma = -0.555^{***}(-0.002)$

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Table A9 - Relationship between standard deviation of income and trust

	St. dev. income
Trust	274.979***
	(56.119)
Country fixed effects	Yes
Wave fixed effects	Yes
Observations	488,641
R-squared	0.982

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Table A10 - Differences in means for observable characteristics between individuals reporting 10 and the median person in each country

Characteristic	Difference in Means	p-value
Age	5.8598	3.10E-174
Male	-0.0337	2.61E-07
Immigrant	0.0285	1.02E-28
Married	-0.0025	0.8987
Father primary education	0.0371	1.38E-09
Unemployed	-0.0038	0.00131
Years of education	-0.2805	0.0008596
Big city	0.004	0.8306
Small city	-0.0139	0.2282
Risk aversion	0.0046	0.932
Trustworthiness	0.4201	3.44E-17

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⁵³ European Social Survey, *ESS Data Portal*

⁵⁴ European Social Survey, *ESS Data Portal*

Table A11 - Relationship between trust and income in Low, High, and medium trust country groups

Dependent variable: log(income)	High trust	Medium trust	Low trust
Trust 1	0.031 (0.021)	0.014 (0.012)	0 (0.015)
Trust 2	0.059*** (0.017)	0.059*** (0.01)	0.052*** (0.014)
Trust 3	0.096*** (0.015)	0.088*** (0.009)	0.058*** (0.013)
Trust 4	0.100*** (0.015)	0.098*** (0.009)	0.062*** (0.014)
Trust 5	0.111*** (0.014)	0.107*** (0.009)	0.070*** (0.012)
Trust 6	0.152*** (0.015)	0.146*** (0.009)	0.103*** (0.015)
Trust 7	0.183*** (0.014)	0.162*** (0.009)	0.131*** (0.015)
Trust 8	0.182*** (0.014)	0.174*** (0.01)	0.112*** (0.017)
Trust 9	0.183*** (0.015)	0.149*** (0.015)	0.080*** (0.027)
Trust 10	0.102*** (0.018)	0.063*** (0.018)	0.037 (0.029)
Constant	10.054*** (0.03)	7.227*** (0.021)	7.155*** (0.043)
Observations	111,595	98,904	37,648
R-squared	0.469	0.672	0.489

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Table A12 - Relationship between trust and income in SOM data, sample split across certain observables

Dependent variable: log(income)	Young	Old	High risk	Low risk	Not citizen	Citizen
Trust 1	0.042 (0.04)	0.028 -0.031	0.043 -0.036	0.033 -0.034	0.07 -0.131	0.039 -0.026
Trust 2	0.127*** (0.032)	0.107*** (0.024)	0.103*** (0.028)	0.135*** (0.027)	0.079 (0.112)	0.124*** (0.02)
Trust 3	0.168*** (0.029)	0.130*** (0.022)	0.157*** (0.025)	0.145*** (0.025)	0.192* (0.099)	0.151*** (0.018)
Trust 4	0.175*** (0.029)	0.151*** (0.022)	0.166*** (0.026)	0.162*** (0.025)	0.167 (0.103)	0.167*** (0.018)
Trust 5	0.146*** (0.028)	0.131*** (0.02)	0.131*** (0.024)	0.138*** (0.023)	0.091 (0.092)	0.140*** (0.017)
Trust 6	0.246*** (0.028)	0.212*** (0.02)	0.217*** (0.024)	0.234*** (0.023)	0.285*** (0.095)	0.229*** (0.017)
Trust 7	0.242*** (0.027)	0.242*** (0.02)	0.233*** (0.024)	0.245*** (0.023)	0.307*** (0.092)	0.241*** (0.017)
Trust 8	0.215*** (0.027)	0.259*** (0.02)	0.233*** (0.024)	0.246*** (0.022)	0.293*** (0.092)	0.242*** (0.017)
Trust 9	0.210*** (0.029)	0.272*** (0.02)	0.243*** (0.025)	0.252*** (0.023)	0.257** (0.1)	0.251*** (0.017)
Trust 10	0.160*** (0.029)	0.186*** (0.021)	0.166*** (0.025)	0.182*** (0.024)	0.191* (0.102)	0.177*** (0.018)
Constant	13.954*** (0.061)	11.864*** (0.1)	12.253*** (0.042)	12.609*** (0.034)	12.222*** (0.172)	12.463*** (0.026)
Observations	50,509	64,029	48,426	66,112	3,498	110,874
R-squared	0.284	0.417	0.348	0.34	0.338	0.339

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Table A13 - Trust's standard deviation at each income level in Sweden in ESS data

Income Level	St. dev. trust
1	2.429177
2	2.283784
3	2.223404
4	2.1247
5	2.013078
6	2.170333
7	2.185911
8	2.131649
9	2.309307
10	
11	2.01251
12	
13	
14	
15	2.577039

*Income levels divided as 1=0-9999, 2=10000-19999,3=20000-29999..., for annual
“Household's total net income, all sources” in euros

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Table A14 - Trust's standard deviation at each income level in Great Britain in ESS data

Income Level	St. dev. trust
1	2.39411
2	2.267806
3	2.132432
4	2.121094
5	2.059143
6	1.996723
7	1.898118
8	1.947873
9	1.690412
10	
11	2.010953
12	
13	
14	
15	2.1384

*Income levels divided as 1=0-9999, 2=10000-19999,3=20000-29999..., for annual
“Household's total net income, all sources” in euros

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Table A15 - Trust's standard deviation at each income level in Turkey in ESS data

Income Level	St. dev. trust
1	2.69822
2	2.583765
3	2.481761
4	1.992844
5	3.628173
6	
7	
8	2.712405
9	
10	
11	0.7071068
12	
13	
14	
15	3.34664

*Income levels divided as 1=0-9999, 2=10000-19999,3=20000-29999..., for annual
“Household's total net income, all sources” in euros

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Table A16 - Trust's standard deviation at each income level in France in ESS data

Income Level	St. dev. trust
1	2.366476
2	2.186492
3	2.123832
4	2.031661
5	1.997895
6	1.973106
7	2.016388
8	2.056638
9	
10	
11	2.435518
12	
13	
14	
15	2.511715

*Income levels divided as 1=0-9999, 2=10000-19999,3=20000-29999..., for annual
 “Household's total net income, all sources” in euros

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Table A17 - Trust level distribution in low trust countries in ESS data

Trust	Frequency	Percent	Cumulative
0	12,477	13.49%	13.49%
1	8,221	8.89%	22.38%
2	10,752	11.63%	34.01%
3	12,901	13.95%	47.96%
4	9,844	10.65%	58.61%
5	17,303	18.71%	77.32%
6	6,733	7.28%	84.60%
7	6,683	7.23%	91.83%
8	4,511	4.88%	96.70%
9	1,441	1.56%	98.26%
10	1,606	1.74%	100.00%
Total	92,472	100.00%	

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⁶⁰ European Social Survey, *ESS Data Portal*

⁶¹ European Social Survey, *ESS Data Portal*

Table A18 - Trust level distribution in medium trust countries in ESS data

Trust	Frequency	Percent	Cumulative
0	14,587	7.42%	7.42%
1	8,892	4.52%	11.94%
2	16,343	8.31%	20.25%
3	23,643	12.02%	32.28%
4	20,781	10.57%	42.84%
5	42,298	21.51%	64.35%
6	21,978	11.18%	75.53%
7	25,143	12.79%	88.32%
8	15,840	8.06%	96.37%
9	3,933	2.00%	98.37%
10	3,197	1.63%	100.00%
Total	196,635	100.00%	

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Table A19 - Trust level distribution in high trust countries in ESS data

Trust	Frequency	Percent	Cumulative
0	5,928	2.97%	2.97%
1	3,893	1.95%	4.92%
2	7,786	3.90%	8.82%
3	14,129	7.08%	15.91%
4	15,277	7.66%	23.56%
5	37,056	18.57%	42.13%
6	23,649	11.85%	53.98%
7	40,540	20.32%	74.30%
8	35,850	17.97%	92.27%
9	9,945	4.98%	97.25%
10	5,481	2.75%	100.00%
Total	199,534	100.00%	

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⁶² European Social Survey, *ESS Data Portal*

⁶³ European Social Survey, *ESS Data Portal*

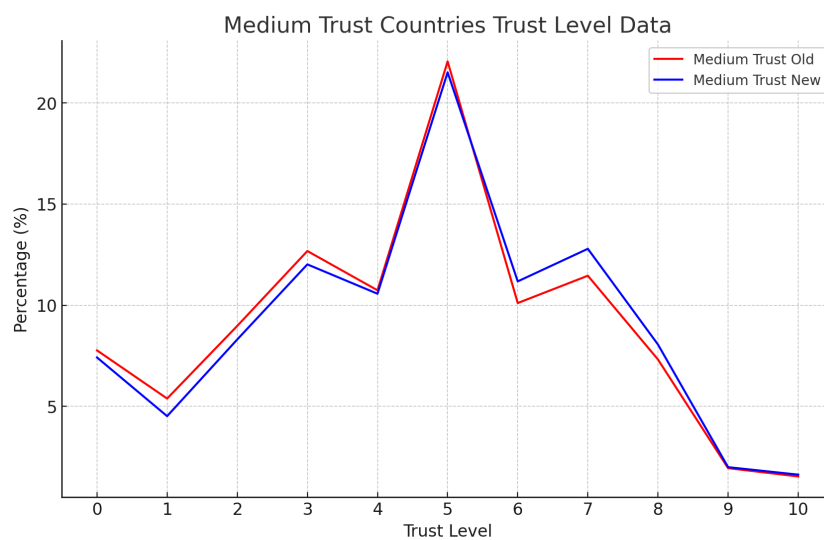
Figure A1 - Trust level distribution evolution in high trust countries in ESS data



*Comparing distribution of trust levels in our complete dataset vs the limited dataset the previous paper used (up to and including ESS round 5)

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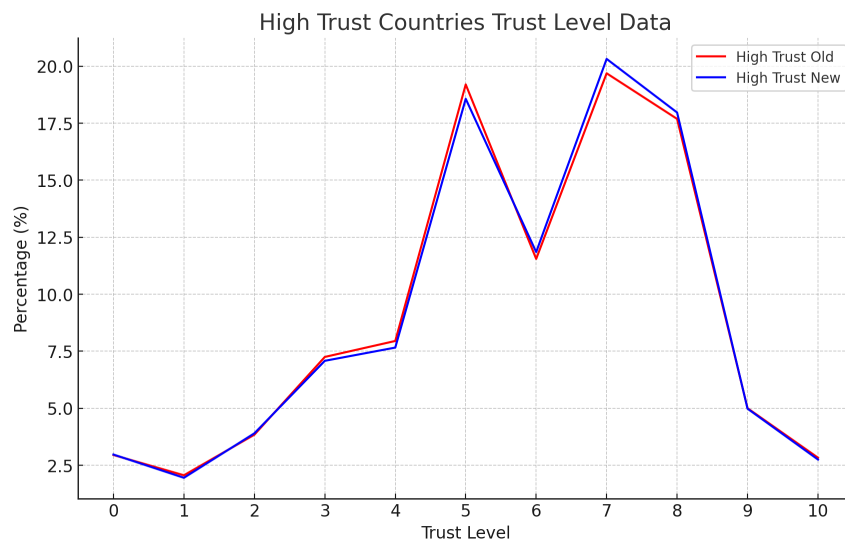
Figure A2 - Trust level distribution evolution in medium trust countries in ESS data



*Comparing distribution of trust levels in our complete dataset vs the limited dataset the previous paper used (up to and including ESS round 5)

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Figure A1 - Trust level distribution evolution in low trust countries in ESS data



*Comparing distribution of trust levels in our complete dataset vs the limited dataset the previous paper used (up to and including ESS round 5)

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Deep dive A1

The link provides an comparison of all regressions in this paper and the previous paer for further comparison and discussion:

<https://docs.google.com/document/d/1lxhuRflyBDne8N9yfhUnoa-tB0Z7sxuFofRcRhJ6a2U/edit?usp=sharing>