

Does Trust Pay Off?

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Abstract

We exploit a data driven latent class model to classify individuals in two distinct trust classes: one for low, and one for high trust individuals. Subsequently, by entering class membership in a two-wave panel analysis we find that belonging to the high trust class positively influences an individual's economic performance, as measured by individual wage earnings. We show that trust related income differences between and within individuals are robust against endogeneity by suggesting that trust is dependent upon social intelligence. To the best of our knowledge, this is the first time these conclusions have been claimed using micro-level multiple-wave data.

JEL-Classification: D31, D71, J31

1. Introduction

The last fifteen years has seen a surge in the number of studies dealing with the concepts of trust, social capital, and their relation to economic performance (for recent reviews see Nannestad (2008) and Westlund/Adam (2010)). These empirical analyses have provided a sizable body of evidence for the positive influence of trust on the creation of civil society and on economic prosperity. However, some elements of the trust-economic performance relationship have not yet received the appropriate amount of empirical attention.

Firstly, empirical validation of the trust-economic performance relationship based on micro-level (survey) data remains absent. Secondly, and related, it remains unclear through which mechanisms trust influences individual economic performance. Both issues are addressed in this paper.

The remainder of this paper is organized as follows. Section 2 will present the theoretical framework for the proposed empirical analysis. Section 3 will deal with the study's data and variable operationalizations. In section 4, we will present the methods, models and estimation results. Finally, our research conclusions are presented in section 5.

2. Theoretical Framework

It is generally understood that trust, or “the belief that others will not deliberately or knowingly do us harm, if they can avoid it, and will look after our interests, if this is possible (Delhey/Newton, 2005)”, is one of the most important drivers for collaborations between individuals to succeed. In terms of economic performance trust has the ability to reduce transaction costs, as it can substitute (partially) for the negotiation, monitoring and enforcement of property rights, contracts and law. Furthermore, trust increases the speed and quality of information diffusion across networks of individuals. Secondly, because trust mitigates principal-agent problems, principals in high-trust economies can cut down on expenses and efforts associated with the monitoring of agents, and as such devote more time and energy to innovative activities with accompanying higher economic pay-offs. Thirdly, trust facilitates in collective action problem solving, as it allows more easily for consensus to be reached due to the fact of it being based on common norms and values.

The literature generally recognizes three dimensions of trust (Newton/Zmerli, 2011). The first dimension, thick trust, is trust that is built in compact, dense networks of people, such as family or friend networks. The second, interpersonal trust, is defined as trust that emerges through “spontaneous sociability”, or trust that builds through loose relations with non-kin individuals (i.e. strangers). Thirdly, institutional trust, which is empirically most often regarded as trust in the political system, government and major companies, can be viewed of as a form of non-negotiable trust that is a reflection of the reputation of a certain body of individuals, achieved through many collaborative iterations.

Previous research has shown that of these three mechanisms interpersonal trust is key in explaining differences in economic performance. For instance, Dearmon/Grier (2009) show that differences between levels of interpersonal trust also (partially) explain for differences between economic growth between countries. Furthermore, Dincer/Uslaner (2009) show that the level of interpersonal trust positively correlates with indicators of economic performance, such as the growth of income and the level of employment for U.S. regions. Conversely, high levels of thick trust and low levels of interpersonal trust are generally associated with lower levels of economic performance (Portes/Sensenbrenner, 1993; Putnam et al., 1994; Putnam, 2007).

When moving from an aggregate level to a micro level of analysis, somewhat different assumptions regarding the impact of trust apply. Most importantly, it is not realistic to assume that all members of a single society are equally willing to collaborate and trust each other. That is, we cannot simply assume that all members will operate within the mutual interests of others. This trust asymmetry can, in an economic sense, lead to one particular type of individual exploiting the naive (from his particular perspective) trusting disposition of another. For instance, individuals that expect people to be motivated in a self-interested

manner might take advantage of individuals that are overly trusting towards them. As such, defecting on trust then becomes a valid strategy to economize upon. Only when individuals are able to effectively tell trustworthy individuals apart from non-trustworthy individuals can interpersonal trust, or the social norm of trustworthiness, help make the economy in a particular population thrive (Ahn/Esarey, 2008; Anderlini/Terlizzese, 2011).

Recently it has been proposed that in terms of explaining performance, interpersonal trust can also be viewed of as an ability. Individuals that are better in understanding relational cues, such as own and other people's mental frames and internal states, are better at making an informed judgment about the appropriate level of trustworthiness for a given relationship (Six et al., 2010). This hypothesis is derived from the fact that it is not realistic to assume that all members of a single society are equally willing to collaborate and trust each other. That is, one cannot simply assume that all members will operate within the mutual interests of others. Agents that are aware of this asymmetry will adjust their behavior accordingly, and more often self-select into relationships with agents that share their trusting disposition (Cagno/Sciubba, 2010). The ability that allows such judgment is often referred to as social intelligence (Yamagishi, 2011). Important to note is that this ability is not set in stone: individuals can update their beliefs about the trustworthiness of others by obtaining a better understanding the possible future behavior of others in the population, and their own response to it (McEvily, 2011). We will exploit this ability in our analysis.

3. Data

The German Socio-Economic Panel (SOEP) (Wagner et al., 2007) presents panel data for 24,418 German individuals on key socio-economic variables, specifically on trust, and economic performance indicators, such as an individual's wage, for the survey years of 2003 and 2008. We adopt each individual's annual labor earnings, which equals the current year's gross labor income before taxes corrected for the consumer price index (base: 2006 €), divided by the total hours worked yielding the average hourly wage, as our economic performance indicator. The operationalization of the control variables as used in this research is as follows.

Firstly, to control for the level of human capital we include each individual's educational level as expressed by the standardized ISCED metric (which holds 6 levels). Furthermore, each respondent's age and squared age are included, to allow to control for age related circumstances that influence economic performance such as on the job training. Through two dummies we explicitly model for working part-time and being unemployed. Additionally, a dummy variable for gender is considered to control for any labor market differences between males and females. Furthermore, as suggested by recent

findings from Fritsch/Mueller (2008), we control for any left-over economic effects of the Communist regime, in power in East-Germany until 1989, by adding a region dummy.

When controlling for the level of interpersonal trust we adopt the following approach. Starting from 2003, the statements “On the whole, I trust people” and “You can’t be too careful when dealing with strangers” were incorporated into the SOEP survey, each containing answers on a four-point Likert scale (“I fully disagree”, “I somewhat disagree”, “I somewhat agree”, “I fully agree”). We further note that these particular statements have previously been shown to specifically measure trust in strangers (Glaeser et al., 2000; Naef/Schupp, 2009).

Finally, we argue that a particular trusting disposition is reached through social intelligence, which we operationalize by adopting the following statement: “Do you think that most people are helpful, or that they are self-interested?”, which allows for a binary response. Previous experimental research has shown that revealed third-party self-interest may undermine an individual’s willingness to cooperate (Bowles, 2008). In these experiments, most individuals are aware that a certain degree of self-interest is warranted for both parties to benefit economically. However, an excess of self-interest undermines the reciprocal tendencies of individuals, as well as the development of trust (Fukuyama, 2001). People that more accurately infer the appropriate population shares of self-interested and helpful individuals will also have a higher chance of correctly inferring the trustworthiness of strangers in the population, as both are related. Such individuals are subsequently better able to self-select themselves into high-trust relationships, and will be able to maintain such high-trust interactions if they are able to continuously reciprocate the high-trust disposition.

4. Models, Methods and Results

Two general approaches are considered in this research. Firstly, using the two interpersonal trust statements a latent class model is estimated to classify individuals in a low and high trusting class. Secondly, it is verified if high-trust individuals on average perform higher economically; and, if moving to the high trusting class, indicating a higher propensity to engage in (economic) relationships with other high-trust members of the population, significantly impact’s an individual’s economic performance.

4.1 Estimation: Interpersonal Trust

Firstly, we estimate a latent class model (Linzer/Lewis, 2011) to classify respondents as either low or high trust individuals. The goal of the latent class

model is to identify and classify sub-populations in the data, based on an unobserved or latent categorical variable. This latent categorical variable is derived from the available observed or manifest variables, and aims to maximize the expectation about how each individual will respond on each manifest variable. The outcomes of a latent class analysis are probabilities that an individual i “belongs” to a certain unobserved sub-group or latent class. Model selection is typically performed using the Bayesian Information Criterion (BIC) (Schwarz, 1978), which allows for the selection of the number of R latent classes that minimize the value for the BIC. A latent class model is estimated for both survey waves separately. We find that a two class ($R = 2$) solution both minimizes the value for the BIC, as well as intuitively classifies each individual based on the manifest response style. A summary is presented in table 1.

Table 1
Latent class analysis for $R = 2$ latent classes

Statement J	Response K_j	2003		2008	
		Class 1	Class 2	Class 1	Class 2
		Probability π_{jrk}		Probability π_{jrk}	
<i>“On the whole, I trust people”</i>					
	<i>“I fully disagree”</i>	0.12	0	0.10	0.01
	<i>“I somewhat disagree”</i>	0.68	0.11	0.71	0.08
	<i>“I somewhat agree”</i>	0.18	0.80	0.18	0.82
	<i>“I fully agree”</i>	0.02	0.09	0.01	0.09
<i>“You can’t be too careful when dealing with strangers”</i>					
	<i>“I fully disagree”</i>	0.21	0	0.16	0
	<i>“I somewhat disagree”</i>	0.63	0.14	0.59	0.12
	<i>“I somewhat agree”</i>	0.15	0.71	0.22	0.71
	<i>“I fully agree”</i>	0.02	0.15	0.03	0.17
<i>Class size</i>		0.40	0.60	0.41	0.59
<i>N</i>		21,586		18,816	
<i>BIC</i>		88,133		75,721	

Note: round-off differences can amount to $\sum \pi_{jrk} \approx 1$.

4.2 Estimation: Economic Performance

Two models using the variables as described in section 3 are considered. The coefficients in the random-effects panel regression should be read as sample characteristics. That is, inferences made are with respect to any arbitrary individual from our German sample, and denote differences between individuals. The coefficients in the fixed-effects panel regression should be read as individual characteristics. That is, coefficient estimates should be interpreted as the change

in individual i 's labor earnings due to a change in one of the variables of interest for individual i . Furthermore, the fixed-effects model specifically considers the change in economic performance for agents that transitioned from the low-trust class (2003) to the high-trust class (2008). Finally, we adopt an instrumental variables approach to model the hypothesized self-selection of individuals into high-trust relationships. Note that due to modeling limitations¹ in the random-effects I.V. model the first stage estimator again is the aforementioned random-effects estimator. However, due to the fact that the fixed-effects panel model for two waves can be rewritten as a first-differenced linear regression function, effectively writing out the time dimension and as such obtaining change-variables, the more appropriate (first stage) probit estimator may be chosen as per Maddala (1983). This result is more commonly known as a twostage probit least squares (Keshk, 2003) and is implemented for the fixed-effects I.V. here.

We will mainly focus on the interpretation of our interpersonal trust variable. However, we note that our control variables all have signs and magnitudes typical for wage equation estimations. On average, there is a 7% difference in hourly wage between low and high trust individuals. This effect remains after considering, in an econometric sense, the self-selection bias that may occur. Furthermore, low-trust individuals that transition to the high-trust class in the course of the sample's 5 year period see an increase in their performance of a similar magnitude. This suggest that moving towards the high-trust class, which not only holds a larger share of the population (table 1) but also allows for the positive economic effects of high-trust relationships as mentioned in section 2, improves an agent's economic performance.

5. Conclusion

In this article we have shown that in line with previous macro-economic research differences in interpersonal trust also explain for differences in micro-economic outcomes. Using two recent waves from the SOEP, we have shown that when estimating a latent class model two distinct trust classes can be found in the sample population: one class with predominantly low-trust individuals, and one with high-trust individuals. Subsequently, by entering class membership in a two-wave panel analysis we have found that belonging or moving to the high trust class positively influences an individual's economic performance. Furthermore, we suggest that differences in economic performance between individuals can be instrumented for by differences in social intelligence, as measured by a survey statement gaging an individual's outlook on the trustworthiness of other agents.

¹ This is related the longitudinal nature of our data.

Table 2
**Interpersonal trust and individual economic performance. Robust standard errors
 (heteroskedasticity and serial correlation) in parentheses for models: OLS**

Model	R.E.		R.E. I.V.		F.E.		F.E. I.V.
	OLS	(in 2006 €)	2SLS	OLS	OLS	2SLS	Probit
Estimation First stage							
<i>Constant</i>	0.89*** (0.06)		0.88*** (0.06)				
<i>Gender</i>	-0.22*** (0.01)		-0.22*** (0.01)				
<i>Age</i>	0.05*** (0.003)		0.05*** (0.002)				
<i>Age²</i>	-0.001*** (0.00)		-0.001*** (0.00)		-0.0001*** (0.00)		-0.0002* (0.00)
<i>ISCED₂</i>	0.40*** (0.05)		0.40*** (0.03)		0.76* (0.42)		0.69*** (0.25)
<i>ISCED₃</i>	0.51*** (0.05)		0.51*** (0.03)		0.83** (0.35)		0.74*** (0.20)
<i>ISCED₄</i>	0.61*** (0.05)		0.61*** (0.04)		1.01** (0.41)		0.93*** (0.23)
<i>ISCED₅</i>	0.65*** (0.05)		0.65*** (0.04)		0.68* (0.40)		0.65*** (0.23)
<i>ISCED₆</i>	0.94*** (0.05)		0.93*** (0.03)		1.45*** (0.37)		1.29*** (0.24)
<i>Part – time</i>	-0.22*** (0.01)		-0.22*** (0.01)		-0.08 (0.05)		-0.07** (0.04)
<i>Unemployed</i>	-0.41*** (0.01)		-0.41*** (0.01)		-0.12** (0.05)		-0.10*** (0.04)
<i>Region</i>	-0.39*** (0.01)		-0.39*** (0.01)		0.02 (0.14)		0.02 (0.12)
<i>Trust class : High</i>	0.07*** (0.03)		0.08*** (0.03)		0.06** (0.02)		0.10* (0.05)
<i>N</i>	24,418		24,418		2,221		2,221
<i>R²</i>	0.28		–		0.03		–

Significance levels: $p < 0.01$ “***”, $p < 0.05$ “**”, $p < 0.10$ “*”, $p < 0.10$ “**”.

References

- Ahn, T. K./Esarey, J.* (2008): A Dynamic Model of Generalized Social Trust, *Journal of Theoretical Politics* 20(2), 151–180.
- Anderlini, L./Terlizzese, D.* (2011): Equilibrium Trust, Technical Report 0913, Einaudi Institute for Economic and Finance (EIEF).
- Bowles, S.* (2008): Policies designed for self-interested citizens may undermine the moral sentiments: evidence from economic experiments, *Science* 320(5883), 1605–1609.
- Cagno, D. D./Sciubba, E.* (2010): Trust, trustworthiness and social networks: Playing a trust game when networks are formed in the lab, *Journal of Economic Behavior & Organization* 75(2), 156–167.
- Dearmon, J./Grier, K.* (2009): Trust and development, *Journal of Economic Behavior & Organization* 71(2), 210–220.
- Delhey, J./Newton, K.* (2005): Predicting Cross-National Levels of Social Trust: Global Pattern or Nordic Exceptionalism?, *European Sociological Review* 21(4), 311–327.
- Dincer, O./Uslaner, E.* (2009): Trust and growth, *Public Choice* 142, 59–67.
- Fritsch, M./Mueller, P.* (2008): The effect of new business formation on regional development over time: the case of Germany, *Small Business Economics* 30(1), 15–29.
- Fukuyama, F.* (2001): Social capital, civil society and development, *Third World Quarterly* 22(1), 7–20.
- Glaeser, E. L./Laibson, D. I./Scheinkman, J. A./Soutter, C. L.* (2000): Measuring Trust, *The Quarterly Journal of Economics* 115(3), 811–846.
- Keshk, O. M. G.* (2003): CDSIMEQ: A program to implement two-stage probit least squares, *Stata Journal* 3(2), 157–167.
- Linzer, D. A./Lewis, J. B.* (2011): poLCA: An R Package for Polytomous Variable Latent Class Analysis, *Journal of Statistical Software* 42(10), 1–29.
- Maddala, G. S.* (1983): *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge UK.
- McEvily, B.* (2011): Reorganizing the Boundaries of Trust: From Discrete Alternatives to Hybrid Forms, *Organization Science* 22, 1266–1276.
- Naef, M./Schupp, J.* (2009): Measuring Trust: Experiments and Surveys in Contrast and Combination, ZA Discussion Paper 4087, Institute for the Study of Labor (IZA).
- Nannestad, P.* (2008): What Have We Learned About Generalized Trust, If Anything?, *Annual Review of Political Science* 11(1), 413–436.
- Newton, K./Zmerli, S.* (2011): Three Forms of Trust and their Association, *European Political Science Review Online*, 1–32.
- Portes, A./Sensenbrenner, J.* (1993): Embeddedness and Immigration: Notes on the Social Determinants of Economic Action, *American Journal of Sociology* 98(6), 1320–1350.

- Putnam, R. D.* (2007): E Pluribus Unum: Diversity and Community in the Twentyfirst Century The 2006 Johan Skytte Prize Lecture, *Scandinavian Political Studies* 30(2), 137–174.
- Putnam, R. D.,/Leonardi, R./Nanetti, R. Y.* (1994): *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.
- Schwarz, G.* (1978): Estimating the Dimension of a Model, *The Annals of Statistics* 6 (2), 461–464.
- Six, F./Nooiteboom, B./Hoogendoorn, A.* (2010): Actions that Build Interpersonal Trust: A Relational Signalling Perspective, *Review of Social Economy* 68(3), 285–315.
- Wagner, G. G., Frick, J. R./Schupp, J.* (2007): *The German Socio-Economic Panel Study (SOEP): Scope, Evolution and Enhancements*, Technical Report 1, DIW Berlin.
- Westlund, H./Adam, F.* (2010): Social Capital and Economic Performance: A Metaanalysis of 65 Studies, *European Planning Studies* 18(6), 893–919.
- Yamagishi, T.* (2011): Trust as Social Intelligence, *Tokyo*, 107–131.