The Right Amount of Trust

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Economic Growth and Comparative Development
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"It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence" -Arrow(1972)

This Paper...

- Does the individual's levels of trust - beliefs held about other's trustworthiness- has any relationship about the economic outcomes?
- The relationship between *individual* trust and *individual* economic performance is hump-shaped

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- Does the individual's levels of trust - beliefs held about other's trustworthiness- has any relationship about the economic outcomes?
- The relationship between *individual* trust and *individual* economic performance is hump-shaped
  - High trusting individuals tend to assume too much social risk and are cheated more often
  - individuals with overly pessimistic beliefs avoid being cheated, but give up profitable opportunities

This Paper...

It has been shown that trust is correlated with...

- GDP per capita and GDP growth. (Knack and Keefer 1996; Knak and Zack 2001; Alan and Cahuc 2010)
- firms organization across countries (Bloom et al. 2009) and their ability to grow large (La Porta et al. 1997)
- Regulation (Aghion et al. 2010), the size of coutry's stock market (Guiso et al.2008) and cross country trade patterns(Guiso et al.2009)

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- Regulation (Aghion et al. 2010), the size of coutry's stock market (Guiso et al.2008) and cross country trade patterns(Guiso et al.2009)
- **No available research on the individual relationship of trust-income** and its presumable hump-shaped relationship

This Paper...

- Test the relationship between trust and income using data from the European Social Survey (ESS)

  $\rightarrow$ Explore this relationship between individual trust and individual economic performance, particularly at the tails of the distribution of trust beliefs

- **Findings:**
  - Income tends to reach a peak at a level of trust around 7. Beyond a trust level of 7, income declines

This Paper

- This result cannot be explained by standard forms of reverse causality
  - If income causes trust to increase, it can explain the rising portion of the relationship but not the decreasing one, or vice versa

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- This result cannot be explained by standard forms of reverse causality
  - If income causes trust to increase, it can explain the rising portion of the relationship but not the decreasing one, or vice versa
- Robust findings about the three main issues of the pooled OLS analysis done with the ESS
  1. The humpshaped relationship is identified entirely from individuals who respond 10 to the trust question.
  2. Might be different groups (possibly different by country), not necessarily inverted-U-Shaped relationship.
  3. The result may reflect causality running from income to trust.

This Paper

1. The humpshaped relationship is identified entirely from individuals who respond 10 to the trust question.
   - Findings suggest that this also holds in countries with low average level of trust

2. Might be different groups (possibly different by country), not necessarily inverted-U-Shaped relationship.
   - Holds even in a sub group -Swedish data

3. The result may reflect causality running from income to trust.
   - Study the mechanism through which trust beliefs affect economic performance: Exposure to risk of being cheated using IV for ensuring no reverse causality

A simple model

- Investor with an endowment E
  - Decides how much of that investment is invested in a venture managed by a partner

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$$f(S) > S$$

- Partner agrees to return a fraction $0 < \gamma < 1$ to the investor
  - Partner can be *honest* -returns promised share of surplus- or a *cheater* -absconds the whole surplus-

A simple model

- Assumption: Each investor is randomly matched with a partner
- A fraction $1 - \pi$ of partners are cheaters, the rest is honest but **investors do not know the real fraction of cheaters in the population**
- Investors hold heterogeneous trust beliefs τ, distributed on the unit interval $[0, 1]$ about the honesty of the partners

A simple model

- Given the presence of possibly incorrect beliefs, an investor maximizes a perceived utility given by:

$$\max_S Y(S) = E - S + \tau\gamma f(S)$$

subject to:

$$S \leq E$$

A simple model

- Defining S_τ^* as the optimal amount invested (i.e. evaluated using true trustworthiness π), then, $Y(S_\tau^*)$ be the true expected income

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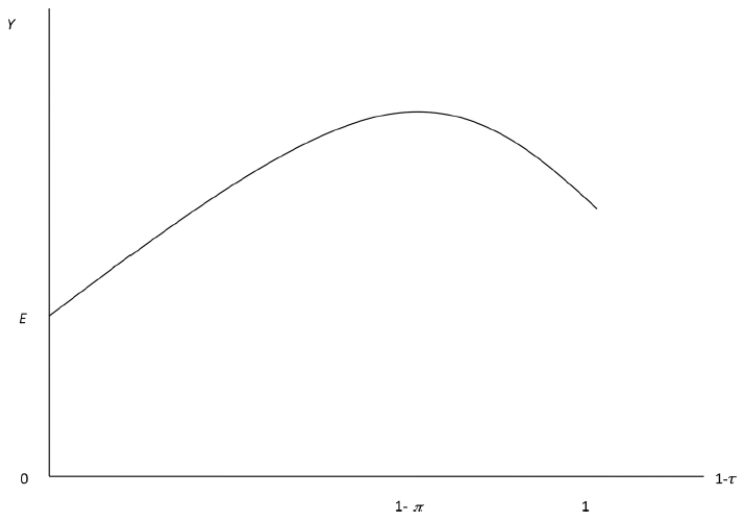
$$Y(S_\tau^*) = E - S_\tau^* + \pi\gamma f(S_\tau^*)$$

- Differentiating $Y(S_\tau^*)$ with respect to the level of trust, τ, yields:

$$\frac{\partial Y(S_\tau^*)}{\partial \tau} = \left[\frac{\pi}{\tau} - 1\right]\frac{\partial S_\tau^*}{\partial \tau}$$

A simple model

Theoretical Income-Trust Relationship

A simple model

Empirical Implications

1. Relationship between individual economic performance and trust beliefs is hump-shaped
2. The observed Individual's performance $Y(S_\tau^*)$ will, ceteris paribus, peak at a higher level of trust for individuals facing more trustworthy pools of partners
   - Since individuals face different pools of partners with different trustworthiness

A simple model

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   $\downarrow$

   One would expect income to peak at a higher level of trust in more highly trustworthy counties

Data

- The European Social Survey
- Measuring trust:
  - "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"
- Measuring performance:
  - Respondents are asked to report which income bracket, identified with a letter, best approximates their household's total net income.
  - They identify each bracket with its midpoint.

Data

- The SOM Survey
- Measuring trust:
  - "In your opinion, to what extent can one trust people in general?"
- Measuring performance:
  - The log of household income before taxes (defined in brackets).
  - They identify each bracket with its midpoint.

Empirical Analysis

- They estimate the following model in the pooled sample of the countries in the ESS:

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

- y_{ic} is the income in logs of individial i in country c
- X_{ic} is a vector of individual controls
- $Trust_{jic}$ is a set of ten dummies
- C is a vector of country fixed effects

Empirical Analysis

TABLE 2. The relationship between trust and income.

Dependent var.: Log (income)	(1) OLS	(2) Heckman	(3) OLS	(4) OLS	(5) OLS
Trust 1	−0.003	−0.002	0.004	−0.003	−0.004
	(0.013)	(0.013)	(0.015)	(0.013)	(0.013)
Trust 2	0.044***	0.042***	0.041***	0.040***	0.042***
	(0.012)	(0.012)	(0.014)	(0.012)	(0.012)
Trust 3	0.070***	0.071***	0.070***	0.060***	0.068***
	(0.011)	(0.011)	(0.013)	(0.011)	(0.011)
Trust 4	0.073***	0.074***	0.059***	0.060***	0.070***
	(0.011)	(0.011)	(0.013)	(0.011)	(0.011)
Trust 5	0.083***	0.084***	0.071***	0.069***	0.081***
	(0.010)	(0.010)	(0.012)	(0.010)	(0.010)
Trust 6	0.117***	0.121***	0.106***	0.097***	0.114***
	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)
Trust 7	0.140***	0.140***	0.134***	0.116***	0.136***
	(0.010)	(0.010)	(0.012)	(0.010)	(0.010)
Trust 8	0.139***	0.141***	0.128***	0.113***	0.136***
	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)
Trust 9	0.138***	0.139***	0.140***	0.115***	0.136***
	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)
Trust 10	0.067***	0.067***	0.071***	0.056***	0.066***
	(0.017)	(0.017)	(0.021)	(0.017)	(0.017)
Country fixed effects	yes	yes	yes	yes	yes
Individual controls	yes	yes	yes	yes	yes
Altruism, risk aversion, trustworthiness	yes	yes	yes	yes	yes
Additional controls	no	no	yes	no	no
Trust legal system (10 dum.)	no	no	no	yes	no
Controlling for moderation	no	no	no	no	yes
Observations	102,298	96,782	64,404	100,449	102,298
R-squared	0.67	0.72	0.67	0.67	0.67
Trust peak = Trust 2 (p-values)	0.00	0.00	0.00	0.00	0.00
Trust peak = Trust 10 (p-values)	0.00	0.00	0.00	0.00	0.00

Empirical Analysis

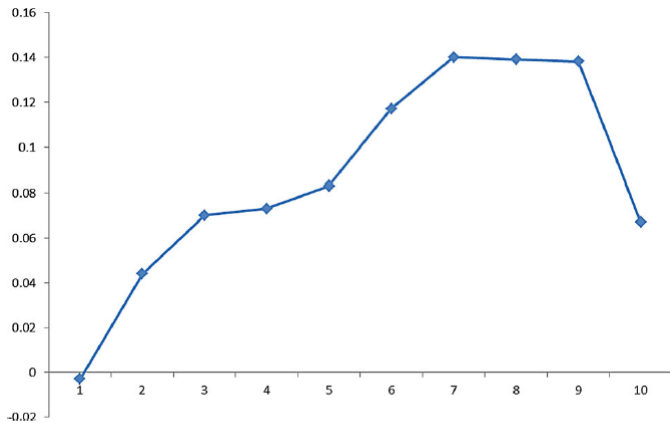## The empirical relationship between trust and income.

FIGURE 3. The empirical relationship between trust and income.

Concerns

1. The humpshaped relationship is identified entirely from individuals who respond 10 to the trust question.

2. The specification restricts the trust–income relationship to be the same—and thus generates the same right level of trust—across individuals.

3. The result may reflect causality running from income to trust.

Concerns

- Compare observables in the sample between people reporting a trust level of 10 and people whose level of trust is equal to the median.
- They run separate regressions for low-, average-, and high-trust countries.
- They report results using the Swedish data set (A large fraction of people in the upper tail of the trust distribution).

Concerns

The empirical relationship between trust and income in low-, average-, and high-trust countries.
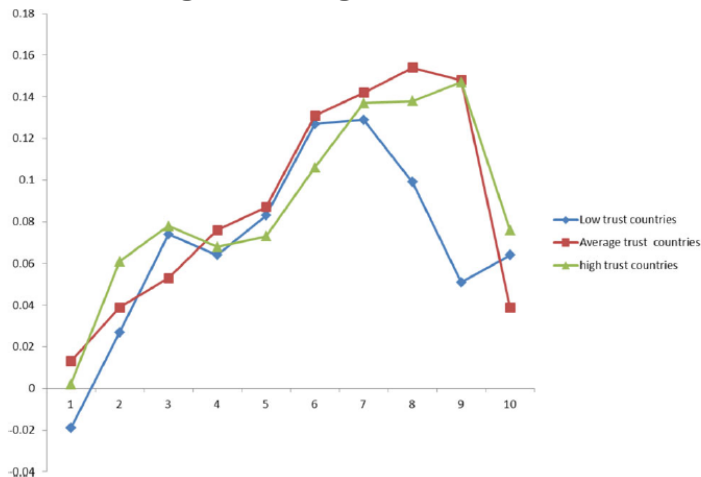
Concerns

TABLE 3. The relationship between income and trust, Sweden.

Dep. var.: log(income)	(1)	(2)
Trust 1	0.038	
	(0.041)	
Trust 2	0.170***	
	(0.032)	
Trust 3	0.205***	
	(0.029)	
Trust 4	0.222***	
	(0.029)	
Trust 5	0.210***	
	(0.027)	
Trust 6	0.275***	
	(0.028)	
Trust 7	0.295***	
	(0.027)	
Trust 8	0.319***	
	(0.027)	
Trust 9	0.337***	
	(0.028)	
Trust 10	0.260***	
	(0.028)	
Trust		0.0653***
		(0.006)
Trust squared		−0.0036***
		(0.000)
Income maximizing trust	9.0	9.10
Trust peak = Trust 2 (p-value)	0.00	
Trust peak = Trust 10 (p-value)	0.00	
Observations	38,991	38,991
R-squared	0.29	0.29

Concerns

- Reverse causality:
  - If reverse causality argument is true, it cannot explain the declining part of the relationship.

Trust and Cheating

- Two suboptimal behavior contribute to the hump-shaped income-trust relationship
  1. Too much trust undermines performance by increasing the chances of being cheated
     $\dashrightarrow$ The chances of being cheated are increasing in trust

Trust and Cheating

- Two suboptimal behavior contribute to the hump-shaped income-trust relationship
  1. Too much trust undermines performance by increasing the chances of being cheated
     --→ The chances of being cheated are increasing in trust
  2. Overly cautions decision making ads to missed profit opportunities
     --→ Evidence for this channel is problematic because missed opportunities are typically unobservable
- Prove the first channel - ESS provide information on how often individuals are being cheated

# Measuring Cheating

- **Data**
  - Second wave of ESS reports information on how often
    respondents have been cheated by 4 **domains**:
    - Bank/insurance company
    - A plumber, builder, car mechanic etc.
    - Seller of second-hand goods
    - A grocer or food seller

Measuring Cheating
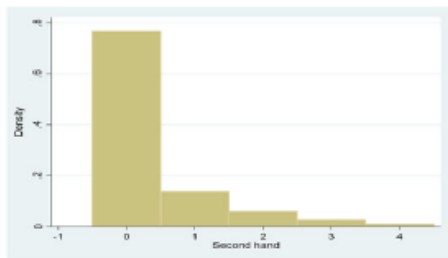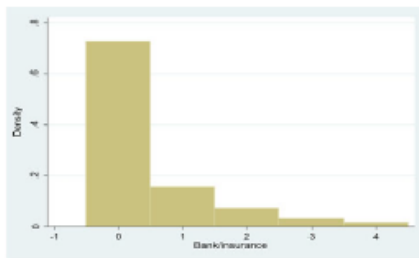
- **Data**
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    - Bank/insurance company
    - A plumber, builder, car mechanic etc.
    - Seller of second-hand goods
    - A grocer or food seller
  - Answers go from never, 1, 2..., 5, 5 or more times

Number of Times Being Cheated
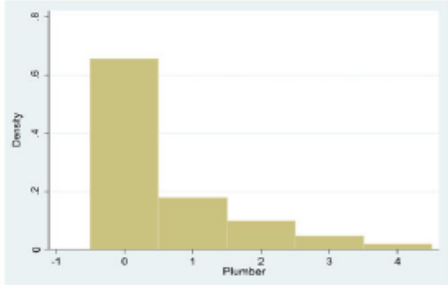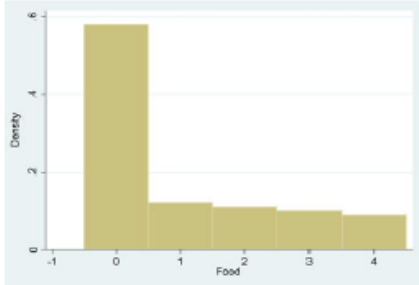
Data

- Construct two summary indicators
  - Total number of times being cheated over the four domains
  - First principal component of the four cheating indicators

Empirical Specification

- **Hypothesis:** Chances of being cheated increase with trust

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

where Z_{ic}^d is a summary indicator of how often individual i has been cheated in country C in a domain d

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- Add a control: risk tolerance

Identification Strategy

Possible Endogeneity

- **Reverse causality:** Does being cheated affects my trust on others?
  - Yes!! That's their hypothesis - People that is being cheated adjust their trust beliefs

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- **Reverse causality:** Does being cheated affects my trust on others?
  - Yes!! That's their hypothesis - People that is being cheated adjust their trust beliefs
- IV approach - Instrument: How much responsibility is delegated to individuals by their supervisors at work

Identification Strategy

Instrument Justification

- Hypothesis: "False consensus" (Ross et al 1977)
  - Tendency of individuals to extrapolate the behaviour of others from their own type
- If I am trustworthy person, my first guess about other is that they would be trustworthy too. $\rightarrow$ my trust on others is based in my own trustworthiness

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Instrument Justification

- **Relevant:**
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- **Exogenous:**
  - Does not explain why should I change my trust beliefs by my experience of being cheated
  - Does not contain individual characteristics that could be associated with the trust beliefs I had before adapting them according to experience

Identification Strategy

Instrument Justification

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  - Based on the false consensus hypothesis, it reflects my trust beliefs about others
- **Exogenous:**
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Identification Strategy

Instrument

- How much responsibility is delegated to individuals by their supervisors at work
- ESS questions[1] about the latitude their manager grants them along:
    - Freedom in organizing their daily work
    - Power to influence policy decisions about the activities of the organization
    - Freedom to choose or change the pace of their work

TABLE 4. Trust and cheating.

	(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***	0.227**	0.589***	0.556***	2.139***	1.098***
	(0.196)	(0.095)	(0.193)	(0.163)	(0.557)	(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***	0.0078***	0.0079***	0.0082***	0.0089***	0.0089***
	(0.0018)	(0.0017)	(0.0017)	(0.0017)	(0.0018)	(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***	0.002***	0.005***	0.005***	0.019***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(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

Trust and Cheating

Findings

- **Estimates imply a large effect of trust on exposure to cheating**

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Findings

- **Estimates imply a large effect of trust on exposure to cheating**
- Note!
  - Results do not show directly that being cheated translates into lost income
  - This is suggestive evidence for a potential mechanism driving the trust-income relationship proposed by the authors

Conclusions

- Document the existence of a hump-shaped relationship between individual trust and individual income
- Excessive trust and excessive mistrust are individually costly
  - **There is a right amount of trust**

Conclusions

- Document the existence of a hump-shaped relationship between individual trust and individual income
- Excessive trust and excessive mistrust are individually costly
  - **There is a right amount of trust**
- The cost of miscalibrated trust beliefs can be substantial $\rightarrow$ of the magnitude as returns on education
- Mistrust is socially costly as it reduces surplus creation, while excessive trust may create social surplus but may be allocated in a way that harms the overly trusting individuals