Finance and Trust

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Preamble

- The word credit comes from the Latin word *credere*, which means to trust.
- So finance is intrinsically related to finance
- It takes a lot of trust to depart with your money in exchange for a promise
- This connection has been ignored until recently
- I will try to summarize some recent advances on this topic

Outline

1. What is trust?
2. How can we measure trust?
3. Describe some recent research on the effect of trust on financial markets
4. What determines trust?
   - Long term
   - Short term
5. Can we modify the level of trust?

1
What is Trust?

Gambetta (2000)

- *Trust (or, symmetrically, distrust) is a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action, both before he can monitor such action (or independently or his capacity ever to be able to monitor it) and in a context in which it affects his own action.*

Generalized trust

- Specific trust:
  - Family
  - Friends
  - Business partners
- Generalized trust:
  - Trust vs a generic person
  - Trust vs the system in general
- I will focus on the latter.
- Notice the two are often negative correlated

Objective vs. Subjective Trust

- The idea of “un pacco” (a package)
- Probability of un pacco in Naples higher than in Boston
- This is the “objective” component
- But in the same situation, I fear un pacco more than the standard American
- That is the “subjective” component

Trust as prior

- Why most people do not play the three card game in the street?
- Suppose that you observe a time series of games does your level of confidence change?
- How much do you believe in the data?
- Conspiracy theory and trust

Prior and Posterior

- In economics we tend to assume that all the posteriors converge.
- This assumes
  - Lots of repetition
  - Everybody observe the same history
- In most real world situations, this is not the case:
  - OJ Simpson case
- Particularly true in financial markets

Persistent Characteristic

- Inglehart (1999)*:"interpersonal trust is a relatively enduring characteristic of given societies: it reflects the entire historical heritage of a given people, including economic, political, religious and other factors."*

2
How Do We Measure Trust?

Two Approaches

1) Surveys

   - World Value Survey question

   "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?"

   - Funny question. Does it mean anything?

2) Experimental games

   - Trust Game
   - Quantity sent

Problem

- Glaeser et al. (2000) finds that

i) **The trust question in WVS is not correlated with the quantity sent in the trust game**

ii) **The trust question in WVS is correlated with the quantity returned in the trust game**

- Yet, quantity sent is 'contaminated' by
  - risk aversion (Karlan 2005)
  - other-regarding preferences (Cox 2003, Ashraf et al. 2006)
- Sapienza et al (2008) find that

Expected trustworthiness of the receiver is

- a good predictor of the quantity sent in the trust game

It is correlated with the trust question in the WVS and other attitudinal questions on trust.

- Proof is in the pudding

3
Recent research on trust and financial markets

Effects of Trust

- Trust facilitates transactions because it saves the costs of monitoring and screening; it is an essential lubricant that greases the wheels of the economic system.
- How could internet commerce work without trust?
- Especially important in the financial sector
  - Trust and stock market investing
  - Trust and credit

Trust and Investing in the Stock Market

- Consider two assets: stock (*S*) and short term Government notes.
- Short term notes are riskless and have a return r_f
- Stock is risky along two dimensions:
  - the <u>return</u>, $\tilde{r}$ is risky : mean $\bar{r}$ and variance σ^2
  - there is a **perceived** probability that the entire <u>capital could be lost</u> as a result of
    - stock broker absconding it
    - expropriation by the company's managers
    - unknown event

Trust as Prior

- The perceived probability of expropriation (*p*) depends on
  - objective characteristics (legal framework, corporate governance)
  - subjective characteristics of the person trusting (individual trust). Differences in:
    - Educational background rooted in past history
    - Religious upbringing can
    - Community the individual lives in

Optimization problem

The optimization problem is :

$$Max_{\alpha}(1-p)EU(\alpha\tilde{r}W+(1-\alpha)r_fW)+pU((1-\alpha)r_fW)$$

The two terms reflect final utility if no cheating and cheating occurs, respectively. The FOC (if solution is internal) is:

$$(1-p)EU'(\alpha\tilde{r}W+(1-\alpha)r_fW)(\tilde{r}-r_f)=pU'((1-\alpha)r_fW)r_f$$

Define $\overline{p}$ as $\overline{p}=(\overline{r}-r_f)/\overline{r}$

Stock market participation and optimal investment in stocks

Proposition 1: If the subjective probability p is above $\bar{p} = (\bar{r} - r_f)/\bar{r}$

then the investor will NOT hold stocks.

For $p <$ $\bar{p}$ (trust is high enough), the investor will participate in the stock market

Proposition 2: When trust declines fraction of wealth invested in stock declines as well.

$$(1-p)EU'(\alpha\tilde{r}W + (1-\alpha)r_f W)(\tilde{r} - r_f) = pU'((1-\alpha)r_f W)r_f$$

Is this story plausible?

- With no costs of participations the probability of being cheated has to be lower than $(\bar{r} - r_f)/\bar{r} = (1.12 - 1.05)/1.12 = .0625$

to induce participation.

- Add participation cost and the threshold declines dramatically.

Implications

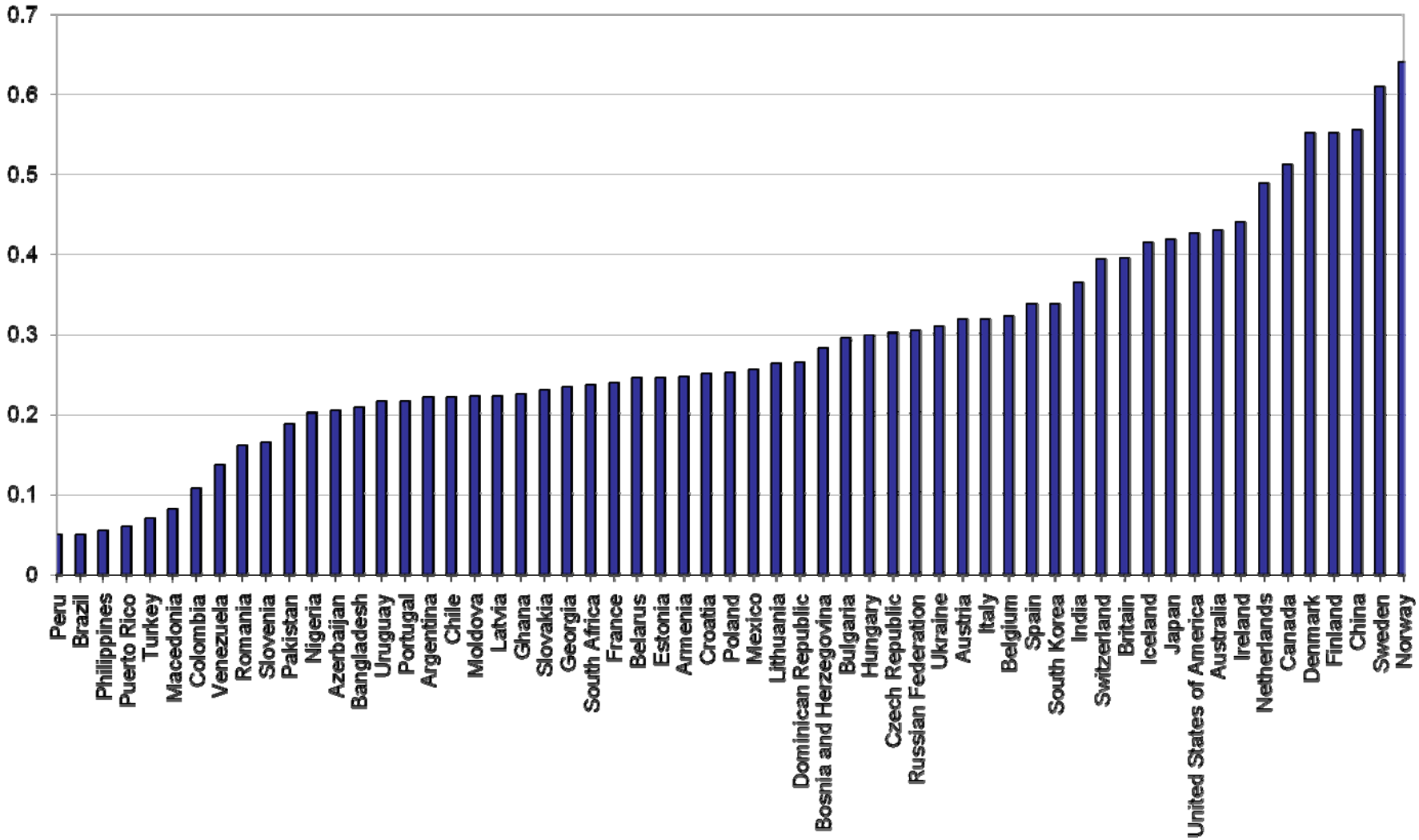
1) Only investors with high trust will hold stock.

2) The more the investor trusts, the higher α^*

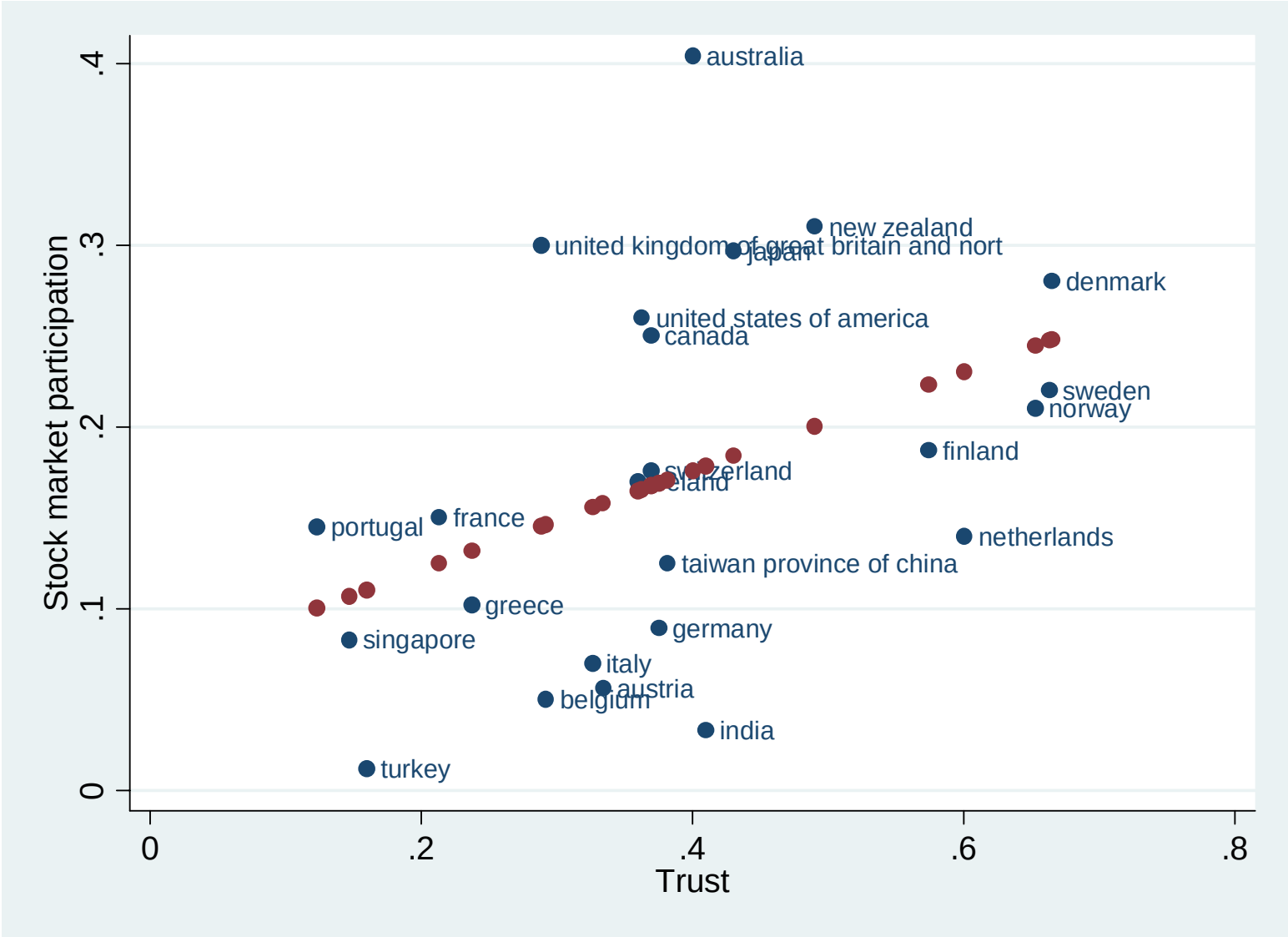
3) With costs of participation and partial trust the wealth threshold to induce participation is higher than with full trust (with a p=5%, the level of wealth has to be 8 times bigger than with p=0)

4) Participation is higher in more trusting countries; *i.e.* in those countries where the subjective belief of being cheated is lower.

Trust from World Values Surveys (1980-1995)



Trust and stock market participation



Trust on Stock Market Participation

	Whole sample				Above median wealth
	(1)	(2)	(3)	(4)	(5)
Trust	0.065***	0.059***	0.057***	0.064	0.072**
Risk aversion	0.055	0.061	0.061	0.012	0.113
Ambiguity aversion		-0.002	-0.002	-0.001	-0.003
Optimism			0.005	0.047*	0.023
Stock market exp to go up				-0.020	
Financial wealth	0.001***	0.001***	0.001***	0.001**	0.001***
Income	0.994	0.837	0.824	-7.001	3.831
Male	0.039	0.036	0.036	0.025	0.047
Age	-0.005**	-0.004*	-0.005*	-0.010*	-0.006
Age square	0.000**	0.000**	0.000**	0.000*	0.000
Household size	-0.015	-0.014	-0.014	0.041	-0.075*
Number of children	0.040	0.037	0.037	0.009	0.121**
College education	0.072**	0.066**	0.063*	0.357***	0.072
High school education	0.041	0.038	0.036	0.169*	0.055
Employee	-0.002	-0.000	-0.002	-0.139**	-0.058
Observations	1,156	1,156	1,156	255	618

More on trust and investing

- More trusting people are more likely to invest in stock and risky assets
- Other things being equal, less trusting people keep their money under the mattress.
- In areas where there is lower trust more likely less financial development and lower use of financial contracts.

Trust and Private vs Public Pensions

- When Italians were offered the choice to switch their contributions out of the public pension system into a private one
- Only ¼ did it
- Trust in mutual funds increases probability of switching by 27 percentage points.

Trust and

"We always have been, we are, and I hope that we always shall be detested in France". Duke of Wellington

	Britain	Germany	France	Italy	Spain
British view	1	2	4	5	3
German view	2	1	3	5	4
French view	4	1	2	5	3
Italian view	3	1	3	4	5
Spanish view	2	1	4	5	3

Cross border portfolio investments

- The more citizens of one country trust citizens of other countries the more likely mutual funds allocation is skewed toward that country
- Trust has a positive impact on cross portfolio allocation controlling for
  - covariance between the stock markets returns
  - various measures of information.
- Similar effect of bilateral trust on direct portfolio investments and on venture capital investments.

Trust and Credit

- When you bear all the downside and enjoy no upside, as for a credit relationship, trust is even more important
- Especially for the extension of short term credit
- Trust as a possible determinant of bank runs?
- Preliminary evidence suggests so.

Experimental Evidence

- In an experiment, people who are considered more trustworthy receive more credit.
- With real data (Prosper.com) people who look more trustworthy receive more credit

3
What Determines Trust?

The really big questions

- Where does trust come from?
  - Biology (Kosfeld et al., 2005; Camerer et al., 2004)
  - Culture
  - History (Putnam)
  - Economics (Axelrod, Coleman)$\Rightarrow$ market and institutions as “primitive”

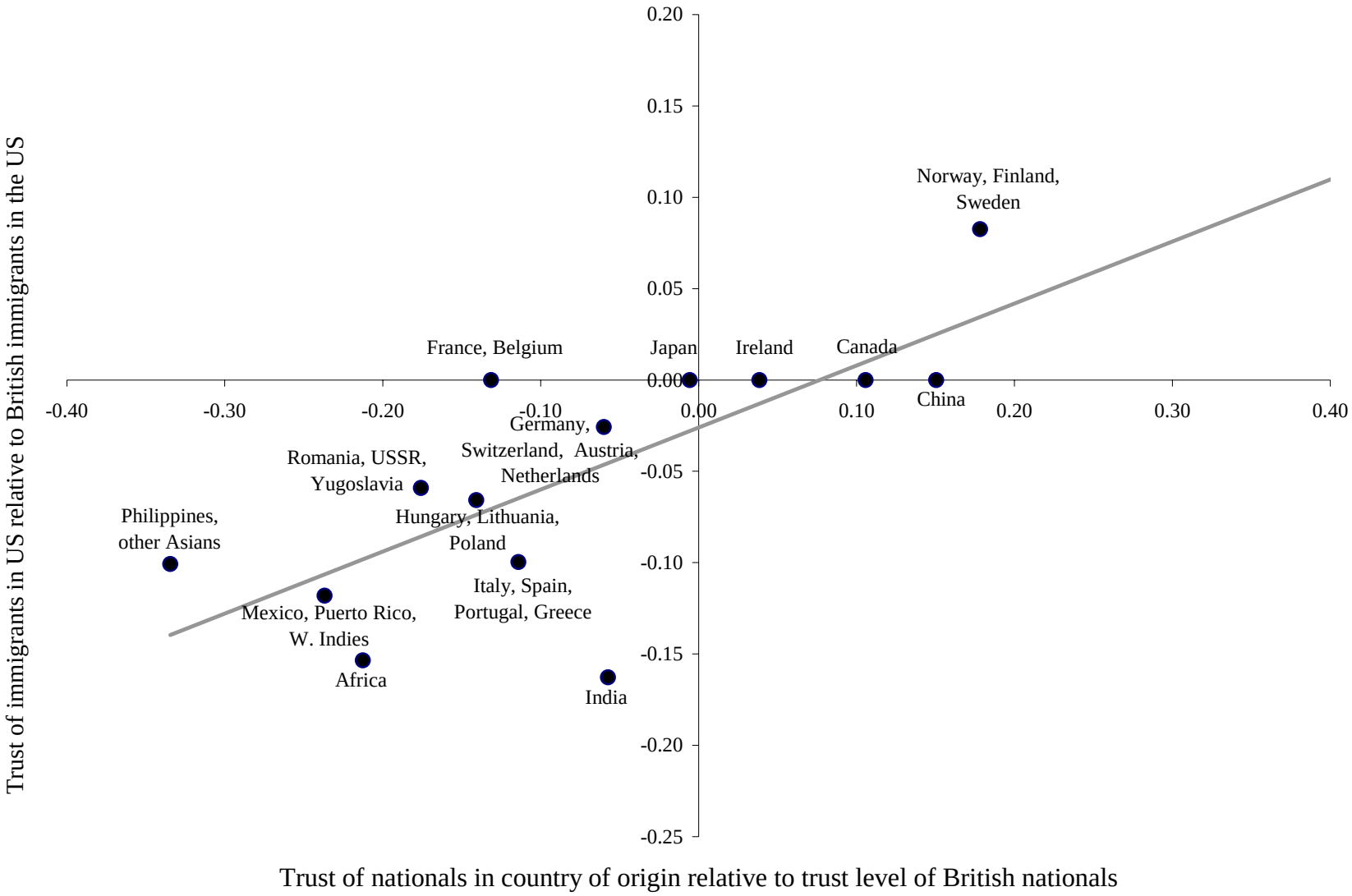
Instinct

- Distinguishing between friends and foe is an essential survival skill
- A study shows that people can assess trustworthiness (credit rating) with no other information than a person’s picture.

The role of biology

- Kosfeld et al. (2005) made students play a trust game and before the game they sprayed subjects with oxytocin or a placebo.
- In animals, oxytocin contributes to social attachments (male and female bonding, mother and infant bonding)
- The investors who had oxytocin exhibited more trust than the others.
- The receivers who had oxytocin did not change their behavior relatively to the control group.
- Their interpretation: oxytocin reduces the natural aversion to betrayal and therefore enhances trust

Trust and culture: immigrants in the US



Determinants of bilateral trust

Common language	0.0469	0.0942*	0.1097*	0.0942*	0.0816	0.0218	0.0407	0.0784
	(0.0657)	(0.0526)	(0.0604)	(0.0525)	(0.0507)	(0.0551)	(0.0606)	(0.0628)
Log (distance)	-0.1083***	-0.0427*	-0.0505*	-0.0428	-0.0136	-0.0070	-0.0271	-0.0148
	(0.0344)	(0.0246)	(0.0291)	(0.0269)	(0.0238)	(0.0264)	(0.0275)	(0.0303)
Common border	-0.0087	-0.0536	-0.0139	-0.0537	-0.0403	-0.0411	-0.0241	-0.0332
	(0.0452)	(0.0362)	(0.0388)	(0.0377)	(0.0344)	(0.0347)	(0.0376)	(0.0391)
Number of years at war 1000-1970		-0.0012***	-0.0011***	-0.0012***	-0.0011***	-0.0012***	-0.0010***	-0.0011***
		(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)
Religious similarity		0.1537***	0.2360***	0.1537***	0.1521***	0.1080**	0.1208***	0.1461***
		(0.0442)	(0.0457)	(0.0440)	(0.0423)	(0.0446)	(0.0447)	(0.0470)
Somatic distance		-0.0605***		-0.0605***	-0.0509***	-0.0438***	-0.0288***	-0.0277***
		(0.0089)		(0.0098)	(0.0087)	(0.0085)	(0.0091)	(0.0099)
Genetic distance			-9.9991**	0.0637				
			(4.3350)	(4.0050)				
Differences in gdp procapita (percentage)					-0.1353***	-0.1388***	-0.1123***	-0.0907**
					(0.0325)	(0.0319)	(0.0346)	(0.0349)
Same legal origin						0.0721**	0.0851**	0.0499
						(0.0304)	(0.0350)	(0.0364)
Transportation costs						-0.0002	-0.0006	-0.0010
						(0.0009)	(0.0009)	(0.0010)
Press coverage							-0.7449**	-0.7335**
							(0.3370)	(0.3441)
Linguistic common roots								0.2104*
								(0.1078)
Country of origin fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Country of destination fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
	207	207	207	207	207	207	179	154
R-squared	0.772	0.840	0.806	0.840	0.854	0.858	0.861	0.837

Historical Roots

- A shock to the benefits of cooperation that took place around the XI century (Italian free city states) is still affect trust and cooperation more than 800 years later.
- This persistence cannot be due to the survival of the original institutions (as in Acemoglu, Johnson and Robinson): the communal institutions have long disappeared (over 700 years ago)
- How to explain it?
  - It reflects cultural transmission of beliefs and values from one generation to another

Cultural Transmission

- GSZ (2008): parents teach priors to their kids: trust =probability other people are trustworthy
- In transmitting prior parents care about children, but
  - they fully internalize the utility of the children only until they themselves are alive

$\Rightarrow$Parents transmit conservative priors

- If children do not trust, they do not trade and do not learn the truth.
- Only a shock can move them from this equilibrium
- Shock can have permament effects

Institutions

- At the country level, low level of trust is correlated with corruption, low legal enforcement, but not clear direction of causality
- But: large differences at the individual level. Within the same legal and institutional structure, great differences in the level of individual trust that affect participation in the stock market.
- Relationship between the micro-economic and macro-economic determinants

Economics

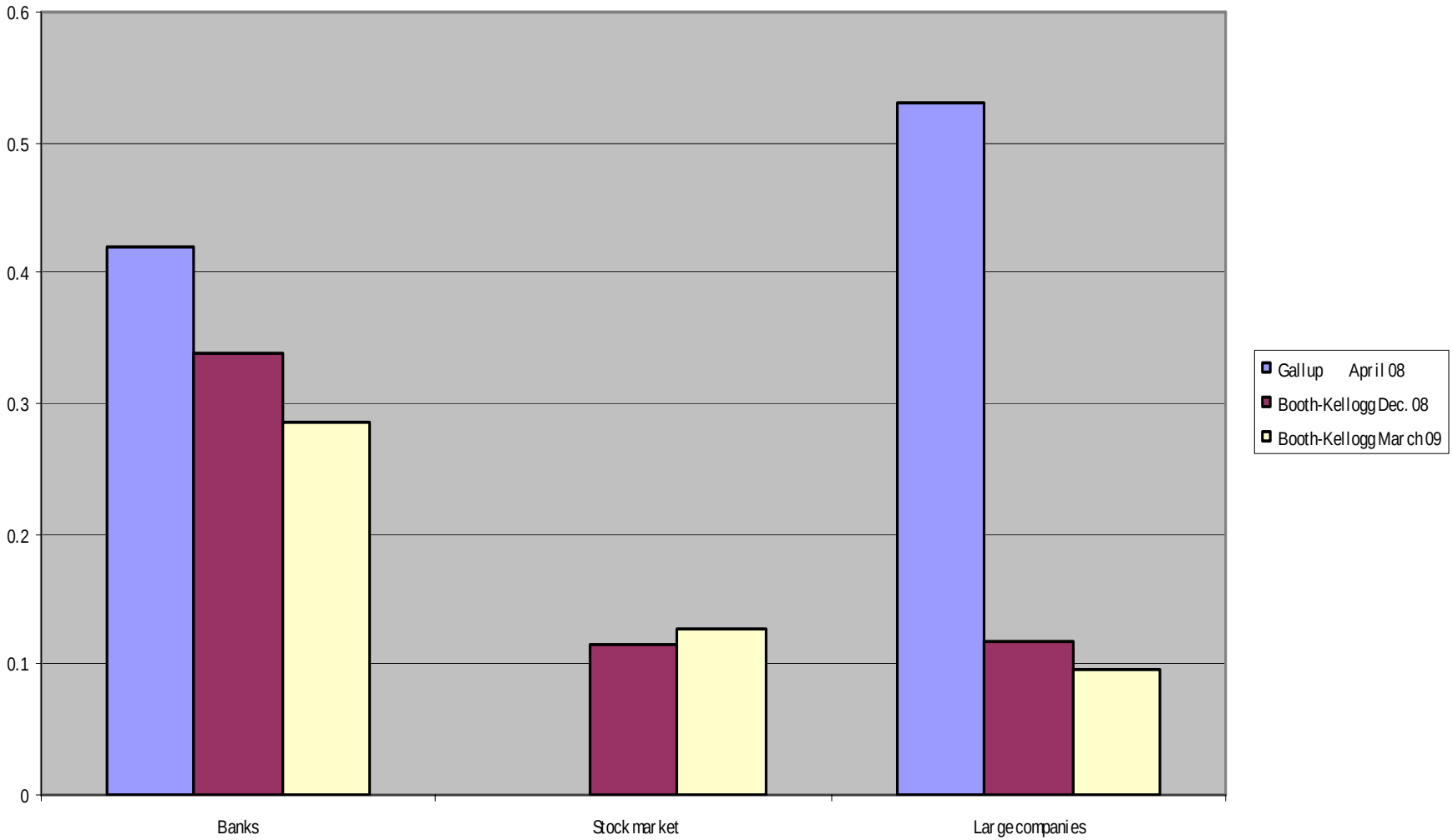
Table 3: Heterogeneity and trust

Dependent variable: Trust

	[1]	[2]	[3]	[4]	[5]
Size of place	-.003	-.002	-.001	-.003	-.001
	(.004)	(.004)	(.004)	(.004)	(.004)
Med HH income	7.071**	6.036**	7.873**	6.924**	7.897**
	(2.695)	(2.696)	(2.435)	(2.663)	(2.779)
Med HH inc. ^2	-.334*	-.286**	-.371**	-.327**	-.374**
	(.129)	(.129)	(.117)	(.128)	(.133)
Crime	-.070	-.040	-.018	-.077	.012
	(.461)	(.442)	(.441)	(.457)	(.439)
Gini		-.966**			-.373
		(.306)			(.449)
Race			-.217**		-.232**
			(.047)		(.090)
Ethnic				-.085	.211
				(.140)	(.159)
INDIV CONTROLS[a]	Yes	Yes	Yes	Yes	Yes
STATES	Yes	Yes	Yes	Yes	Yes
YEARS	Yes	Yes	Yes	Yes	Yes
No. obs.	7196	7196	7196	7196	7196
Pseudo Rsq	.11	.11	.11	.11	.11
Observed P	.42	.42	.42	.42	.42
Predicted P	.40	.40	.40	.40	.40

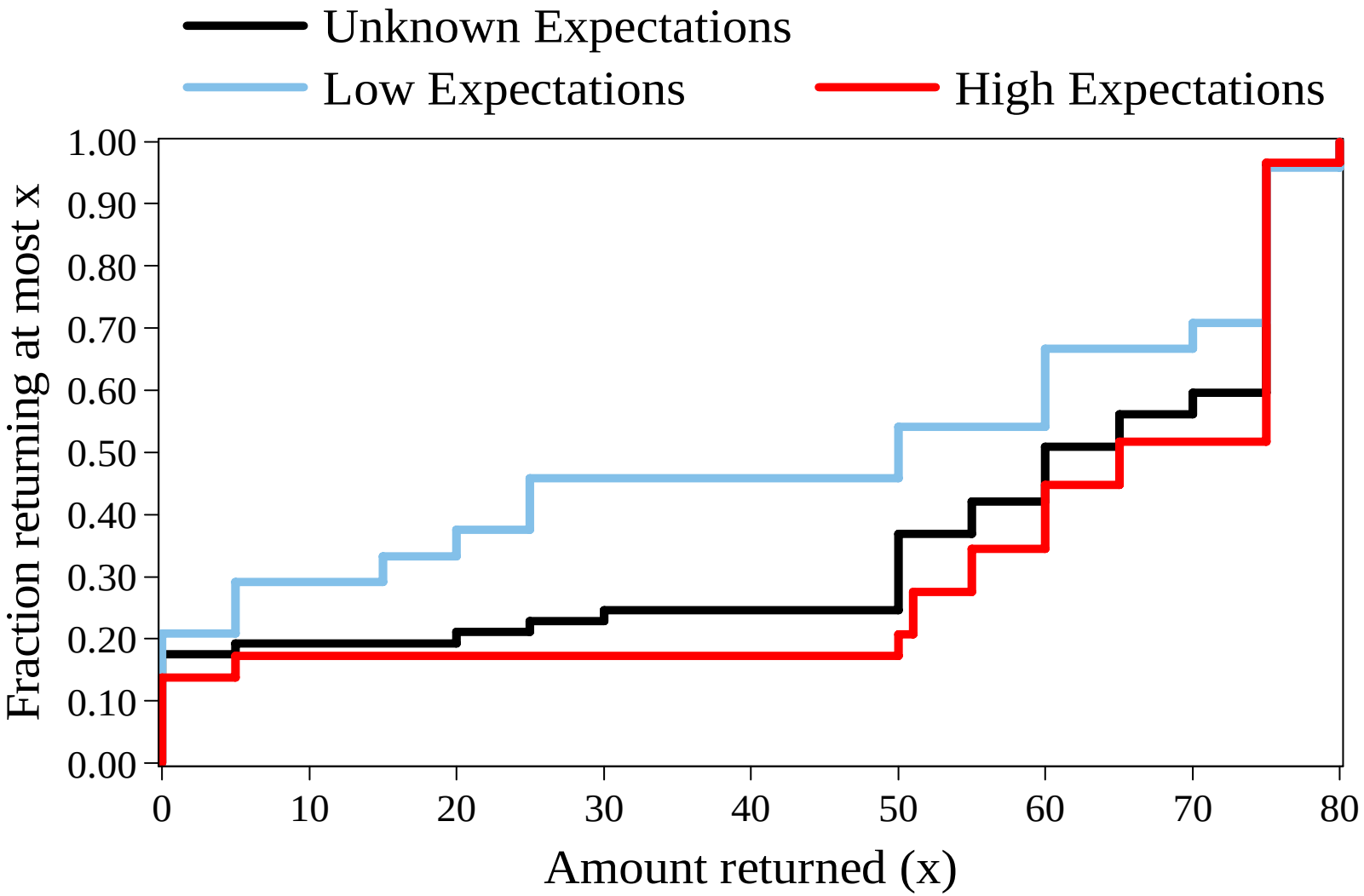
Notes: * denotes significance at the 10 percent level, ** at the 5 percent level. Marginal probit coefficients calculated at the means. Standard errors corrected for heteroskedasticity and clustering of the residuals at the MSA/PMSA level.
(a) Individual controls: all those listed in col. 2 of Table 2.

The effect of the crisis on trust



5
Can We Modify Trust?

Mistrust Is Self-Fulfilling



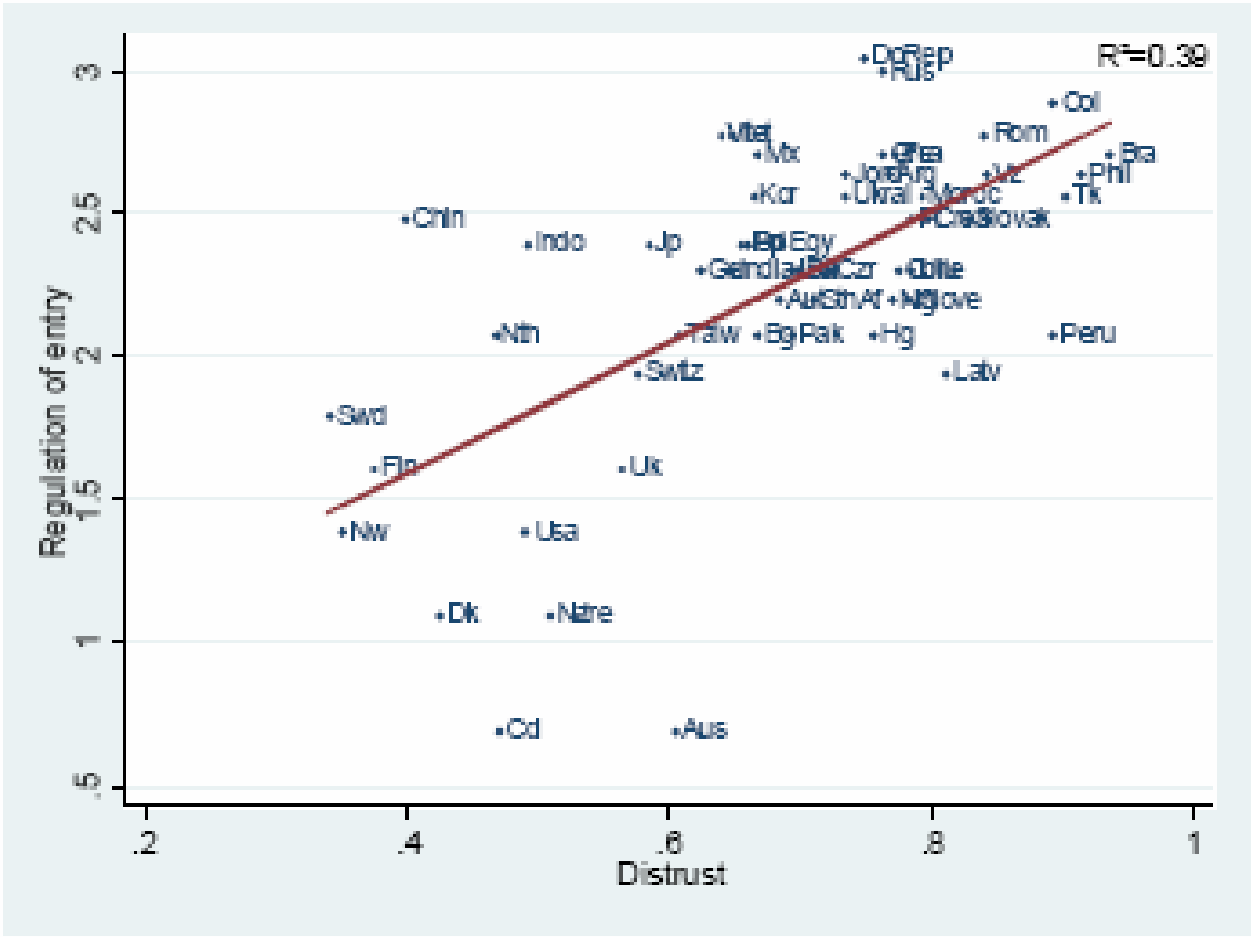
Endorsement

- Cole et al. (2008): pick up of useful insurance product in India affected by the endorsement of a reliable (trustworthy) third party.

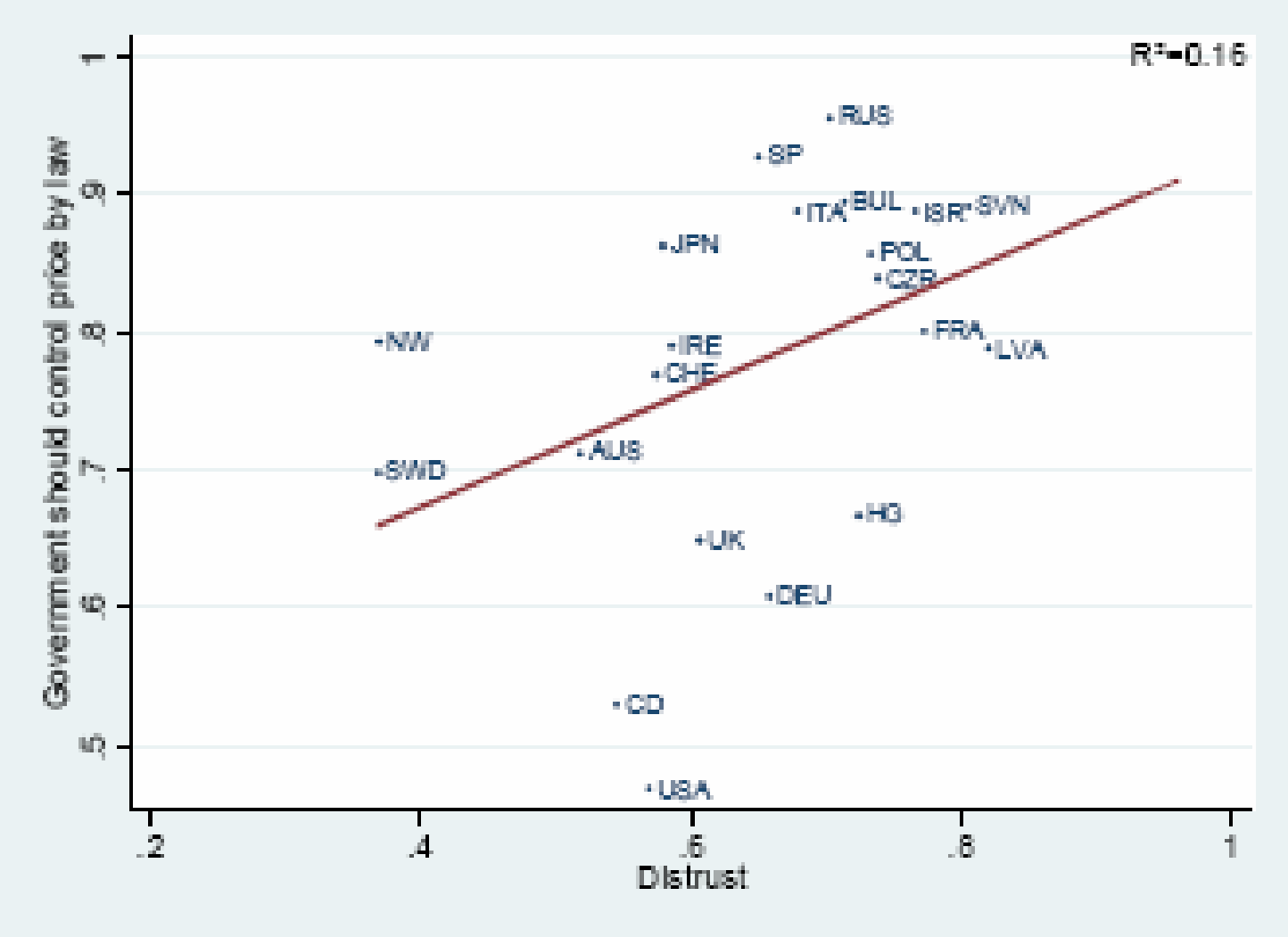
Government Intervention?

- Did SOX contribute to restore trust in U.S. corporate governance?
- Did Paulson's intervention increase or decrease the level of trust?
  - 80% of Americans felt less confident in investing in financial markets as a result of government intervention during the crisis

Mistrust and regulation



Mistrust and demand for regulation



Conclusions

- Trust important for the functioning of financial market
- Established evidence of the relationship between trust and
  - the development of financial market
  - Investment in financial products
- Outstanding question: how can we change (for the better) the existing level of trust?