

# Trust and Discrimination - A Citywide Experiment\*

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- Preliminary Draft -

## Abstract

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# 1 Introduction

Trust is an elementary component of social and economic life. The economic importance of trust derives from the fact that it enhances efficiency in the presence of limited contract enforcement. It is therefore not surprising that economists have accumulated a large body of evidence on the existence and economic consequences of trust using field data, experiments or surveys. Surprisingly little is known, however, about whether people discriminate when trusting. In other words, do they trust strangers from different groups differently? And if so, what are the group characteristics that determine this discrimination? Further, are there individual characteristics, like gender or age, that explain who discriminates and who does not? What is the nature of trust discrimination? Is it taste driven or rather based on a kind of statistical discrimination, i.e., justified in the sense that groups that enjoy relatively low levels of trust also display relatively low levels of trustworthiness? A particular pronounced form of discrimination is in-group favoritism. Do people trust strangers that belong to their own group more than strangers from other groups? Are there individual characteristics that predict the amount of in-group favoritism?

In this paper we address these questions with the help of a field experiment conducted with about 1,000 representatively drawn inhabitants from the city of Zurich. In order to study trust and trustworthiness we used a variant of the trust game introduced by Berg et al. (1995) as the basic experimental tool. In this game first movers can send money to second movers. The money sent is tripled by the experimenters. Second movers then decide how much money they want to return. The amount sent informs us about trust while the back transfer by second movers about their trustworthiness. Note that studying trust discrimination requires a social environment that precisely defines distinct groups. In our study these groups are defined by the 12 districts of Zurich. We think that running a field experiment in a city using its districts as a group-concept is an ideal environment to study group discrimination. The districts are natural geographic entities, have a social meaning and are sufficiently heterogenous to in principal justify differences in trust. Moreover, district affiliation is relevant in every day transactions, which means that the investments observed in the experiment can be seen as a proxy for the thousands of efficiency enhancing and trust-related decisions taken every day, such as car repair, hiring decision or moving decisions.

The first movers made a contingent decision: before knowing the residential district of their second mover they had to make their transfer decision for each of the 12 districts, including their own district. This design feature allows us to study discrimination and in-group favoritism in a straightforward way, simply by comparing the amounts sent

into the different districts. The second mover decisions, on the other side, enable us to measure the actual trustworthiness of the inhabitants of the different districts. We can therefore investigate the nature of the discrimination by correlating the investments into the districts with the respective back transfers.

Our data on the choices of first and second movers is complemented by socioeconomic and personal information about all participants that come from two sources, the statistical office of Zurich and a detailed questionnaire each participant had to answer. We also use statistical information about the districts and data from an additional newspaper experiment we have run in collaboration with a leading daily newspaper in the Zurich area. In this study we asked newspaper readers from Zurich, who were informed about the rules of the experiment, to predict the outcome of the study. In particular they had to indicate the two districts that they thought would receive the lowest investments and the two districts that would receive the highest investments. To guarantee incentive compatibility we promised to pay three randomly chosen readers among those whose answers were correct and pay them CHF 300. A total of 281 newspaper readers took part.

Our main findings can be summarized as follows. First, people discriminate when trusting: subjects display significantly different levels of trust towards strangers depending on which district the stranger lives in. The observed discrimination pattern is quite systematic, i.e., people agree to a large extent on which are the good and bad districts, regardless of which district they themselves live in. The systematics of the discrimination pattern is further supported by the newspaper study. The readers predicted the discrimination pattern extremely well. This indicates that the beliefs about which are the good and bad districts is commonly shared. We then investigate why strangers from some districts are trusted more than strangers from others, i.e., we explore district specific characteristics that explain the discrimination pattern. It turns out that two factors are key: the socioeconomic status as well as ethnic heterogeneity. The higher the economic status and the lower the ethnic heterogeneity, the higher the reputation of a particular district, i.e., the higher the trust placed in strangers from this district. Using our detailed individual data we then study why some subjects discriminate while others don't. We find that better educated people as well as people with children discriminate less, while older people as well as people who favor right wing parties discriminate more.

Second, we explore the nature of the discrimination process and turn to the behavior of second movers. In order to determine their pay back decisions we used the contingent response method, i.e., they had to specify a pay back for each possible investment. This allows us to calculate the trustworthiness of each second mover and the mean trustworthi-

ness of each district – independent of the investments into the district. If discrimination was just taste driven, the correlation between mean investments into the districts and the mean trustworthiness of the districts should not be systematic. If, on the other hand, discrimination is at least in part be driven by the correct anticipation of the districts' trustworthiness trust and trustworthiness should be positively correlated. This is what we find.

In a third step of the analysis, we identify the prevalence and determinants of in-group favoritism. It turns out that first movers send significantly higher amounts to strangers who belong to their own district, compared to strangers from other districts. This in-group bias with respect to trust is not just taste driven as our data on expected back transfers reveals: first movers not only send more money, they also expect to get back more from strangers of their own district than from strangers in other districts. Turning to individual characteristics that determine whether first movers trust people from their own district more than from other districts we don't find any significant effect with one exception. People who report in the questionnaire that they feel connected to their district significantly favor their own district. This effect is strong and significant even after controlling for socio-economic and other attitudinal characteristics.

In the final fourth step we identify determinants of trust and reciprocity on an individual level. These determinants are largely unknown, since existing evidence on trust and reciprocity is mostly confined to lab experiments with homogenous subject pools.<sup>1</sup> With respect to trust we find a strong age pattern with older people trusting less than younger people. This age profile could be driven by bad experience over the life cycle or a general tendency of older people to avoid risky decisions. We also find an impact of education and political orientation. Better educated people as well as people with a leftist political orientation trust strangers significantly more, while people with a rightist political orientation trust less. There is no age pattern in trustworthiness. However, there is an impact of family status as well as religious and residential background. Married people reciprocate more while catholics as well as people who have since long lived in their district reciprocate less.

Figure 1: Histogram of first mover investments

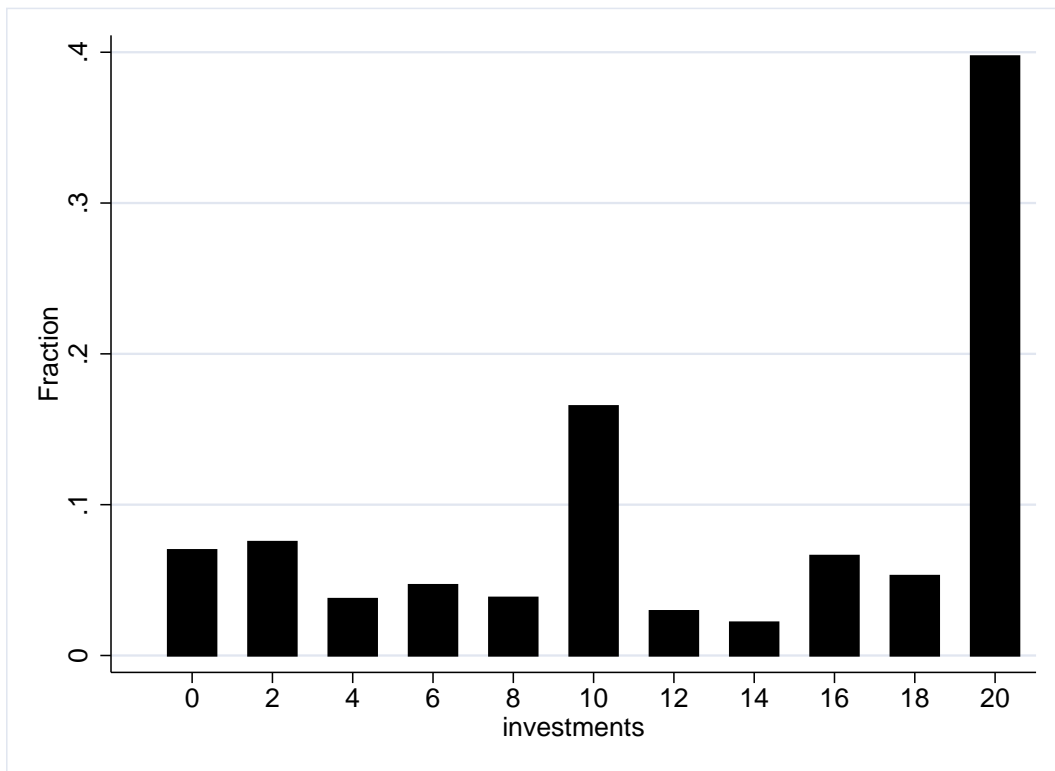


Figure 2: Answers of newspaper readers

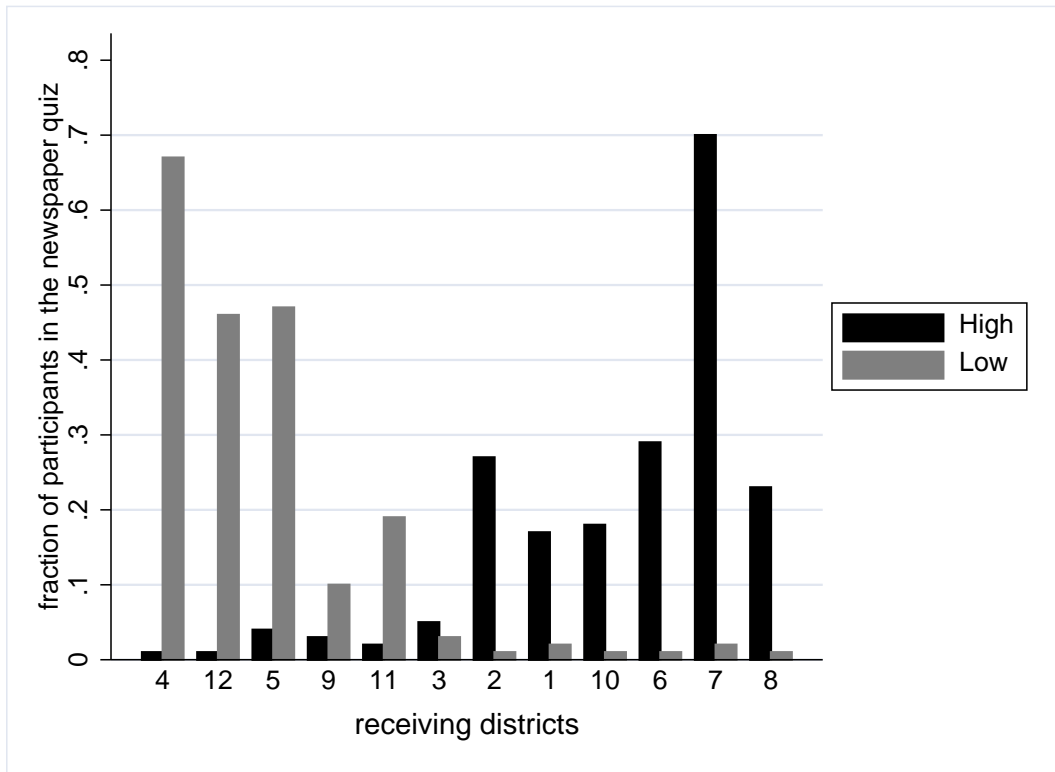


Figure 3: Actual and expected second mover back transfers

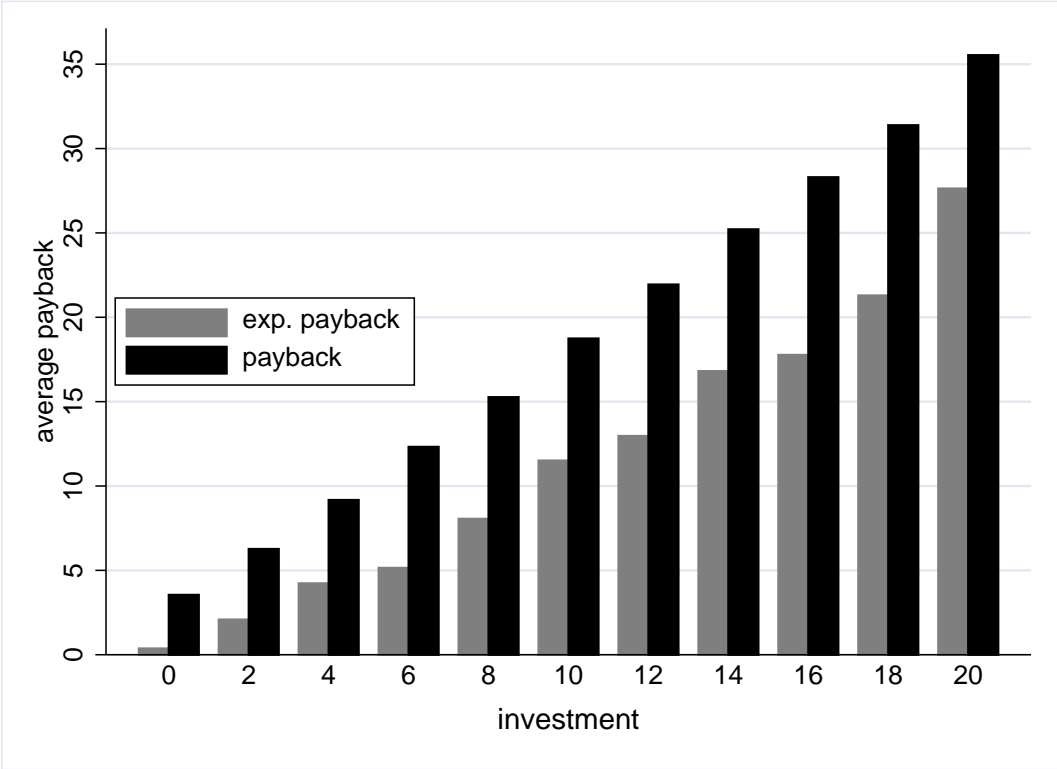


Figure 4: Correlation of investments and reciprocal inclination

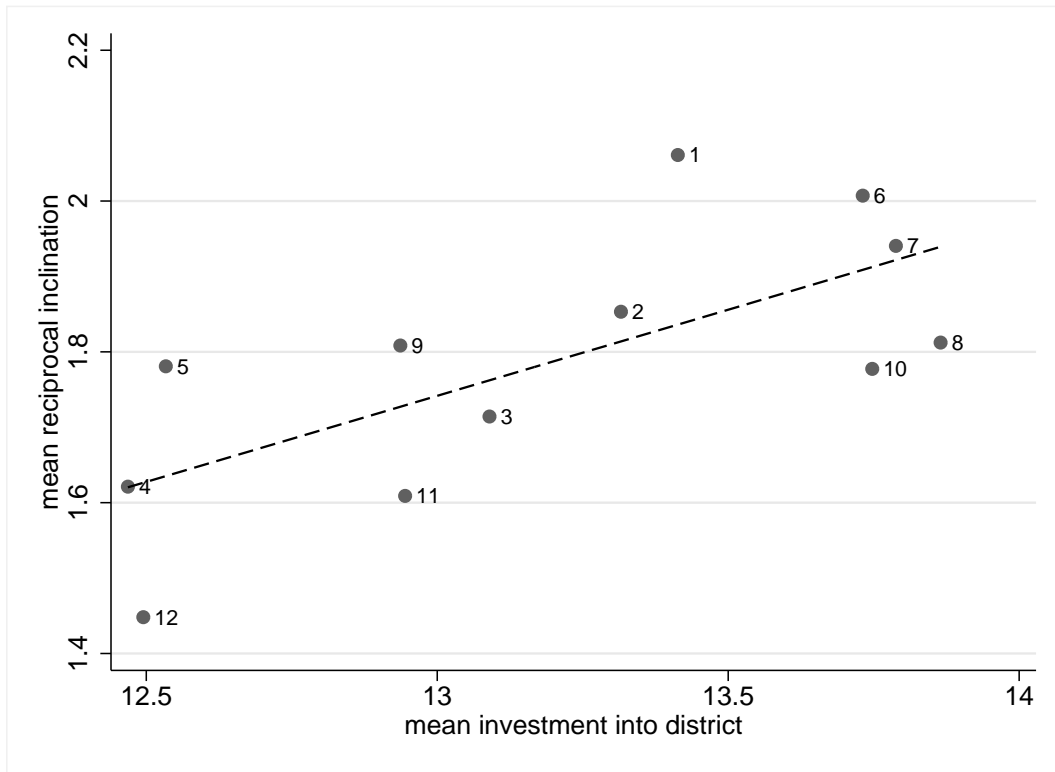


Table 1: Determinants of discrimination

Dependent variable	Discrimination		
Age 31-45	-0.027 [0.168]	0.049 [0.181]	0.051 [0.190]
Age 46-60	0.175 [0.188]	0.213 [0.201]	0.291 [0.220]
Age 61-75	0.691*** [0.219]	0.568** [0.246]	0.551* [0.289]
Age 76 and older	0.955*** [0.300]	0.727** [0.359]	0.752* [0.428]
Female	0.05 [0.125]	0.041 [0.133]	0.021 [0.138]
Only Child	0.113 [0.182]	0.027 [0.192]	-0.02 [0.195]
Tax Income		0.001 [0.016]	-0.01 [0.017]
High skilled		-0.362*** [0.125]	-0.327** [0.128]
Married		0.042 [0.150]	0.035 [0.153]
Children		-0.148* [0.083]	-0.151* [0.083]
Foreigner		0.249 [0.228]	0.257 [0.234]
Years of residency in city			0.003 [0.006]
Connected to city			0.124 [0.136]
Years of residency in district			-0.003 [0.007]
Connected to own district			0.086 [0.182]
Rightwinger			0.822** [0.392]
Leftwinger			-0.211 [0.162]
Catholic			0.087 [0.198]
Protestant			-0.303 [0.190]
Other religion			-0.161 [0.217]
Constant	-0.116 [0.154]	0.019 [0.178]	0.092 [0.251]
Observations	491	470	467

*Notes:* Robust standard errors in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 2: Average investment into districts and expected back transfers

into district	1	2	3	4	5	6
investment	13.41	13.30	13.04	12.44	12.50	13.72
expected back transfer	18.22	17.43	16.73	15.12	15.26	18.15

into district	7	8	9	10	11	12
investment	13.74	13.83	12.90	13.68	12.91	12.45
expected back transfer	17.87	18.17	16.07	17.63	15.96	15.07

Table 3: Pair-wise comparison of investments in districts

Districts	12	5	9	11	3	2	1	10	6	7	8
4	0.25	0.81	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12		0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9				0.69	0.16	0.01	0.02	0.00	0.00	0.00	0.00
11					0.17	0.04	0.02	0.00	0.00	0.00	0.00
3						0.06	0.22	0.00	0.00	0.00	0.00
2							0.38	0.00	0.00	0.00	0.00
1								0.01	0.01	0.01	0.03
10									0.67	0.19	0.54
6										0.31	0.36
7											0.91

*Notes:* The table reports p-values of pair-wise Wilcoxon-signed-rank tests. The units of observation are individual first movers. Districts are ordered by received investments such that districts with similar received investment are located close to each other.

Table 4: Correlation of differentiation across districts

Districts	2	3	4	5	6	7	8	9	10	11	12
1	0.55	0.35	0.03	0.43	0.5	0.34	0.62	0.33	0.17	0.43	0.48
2		0.73	0.35	0.14	0.7	0.96	0.89	0.72	0.70	0.9	0.63
3			0.08	0.37	0.78	0.8	0.7	0.82	0.40	0.83	0.6
4				-0.55	0.12	0.16	-0.06	-0.12	0.52	0.26	0.41
5					0.15	0.13	0.22	0.44	-0.27	0.13	-0.08
6						0.8	0.88	0.48	0.4	0.72	0.7
7							0.85	0.87	0.63	0.95	0.63
8								0.55	0.45	0.74	0.5
9									0.49	0.84	0.62
10										0.9	0.75
11											0.76

*Notes:* The table investigates whether first movers from different districts show similar differentiation patterns. The table reports pair-wise Spearman-rank correlations of investments levels across districts.

Table 5: District characteristics

District	Income <sup>1</sup>	High education <sup>2</sup>	Foreigners <sup>3</sup>	Religious heterogeneity <sup>4</sup>	Years of residency <sup>5</sup>	Home ownership <sup>6</sup>	Catholics <sup>7</sup>
1	39	0.48	0.22	0.68	8.1	0.09	0.27
2	40	0.33	0.23	0.72	10.9	0.06	0.31
3	35	0.26	0.33	0.72	9.4	0.04	0.33
4	30	0.25	0.44	0.71	7.7	0.04	0.36
5	36	0.30	0.39	0.71	6.7	0.06	0.32
6	40	0.44	0.23	0.69	9.9	0.06	0.32
7	44	0.47	0.19	0.68	10.8	0.13	0.28
8	42	0.44	0.25	0.69	10.0	0.08	0.31
9	36	0.19	0.33	0.70	11.3	0.05	0.37
10	40	0.33	0.25	0.70	10.3	0.09	0.32
11	36	0.24	0.33	0.71	9.4	0.06	0.35
12	31	0.15	0.35	0.71	11.0	0.04	0.34
Spearman's Rho <sup>8</sup>	0.92	0.83	-0.85	-0.65	0.18	0.74	-0.75
p	0.000	0.001	0.000	0.022	0.572	0.006	0.005

Notes: Source: Statistical Office of Zurich and Statistical Yearbook of the City of Zurich (2003)

<sup>1</sup> median per capita income in 1000 Swiss Francs (data for unmarried persons only)

<sup>2</sup> population fraction with at least a college degree

<sup>3</sup> population fraction of foreigners

<sup>4</sup> fragmentation index = 1 - sum of squared population fractions of all religions

<sup>5</sup> average number of years with residency in the same district per person

<sup>6</sup> fraction of apartments owned by inhabitants

<sup>7</sup> population fraction of Catholics

<sup>8</sup> Spearman's Rho for the correlation of first mover investments and the variable (incl. p-values)

Table 6: Determinants of trust at the district level

dependent variable	investment						
Income	0.113*** [0.017]	0.063*** [0.018]	0.051*** [0.020]	0.058*** [0.018]	0.063*** [0.018]	0.082*** [0.021]	0.065*** [0.018]
Foreigners	-6.239*** [0.952]	-3.150*** [1.134]	-2.954** [1.168]	-2.803** [1.168]	-3.129** [1.253]	-3.197*** [1.135]	-3.694*** [1.281]
High education			0.677 [0.747]				
Religious heterogeneity				4.252 [3.691]			
Years of residency					0.001 [0.038]		
Home ownership						-3.869 [2.485]	
roman catholics							2.268 [2.285]
Constant	8.928*** [0.616]	14.981*** [0.280]	11.740*** [0.892]	11.889*** [0.881]	10.547*** [1.432]	11.263*** [0.926]	11.085*** [1.081]
Individual fixed effects	YES	YES	YES	YES	YES	YES	YES
Observations	6087	6087	6087	6087	6087	6087	6087
R-squared	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Notes: Robust standard errors clustered on individuals in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 7: First mover's in-group bias

Dependent variable	Investment	Belief	Ingroup Bias		
Own district	1.384*** [0.161]	0.625** [0.257]			
First mover's investment		1.417*** [0.046]			
Age 31-45			-0.774 [0.480]	-0.722 [0.512]	-0.647 [0.527]
Age 46-60			-0.593 [0.538]	-0.601 [0.570]	-0.561 [0.612]
Age 61-75			0.298 [0.606]	0.327 [0.672]	0.285 [0.795]
Age 76 and older			0.509 [0.767]	0.392 [0.938]	0.13 [1.123]
Female			0.136 [0.353]	0.109 [0.374]	0.047 [0.380]
Only Child			0.344 [0.516]	0.614 [0.538]	0.573 [0.548]
Tax Income				0.026 [0.047]	0.034 [0.050]
High skilled				-0.35 [0.352]	-0.391 [0.358]
Married				-0.052 [0.416]	-0.02 [0.422]
Children				-0.047 [0.224]	-0.11 [0.228]
Foreigner				0.183 [0.632]	0.295 [0.651]
Years of residency in city					0.008 [0.015]
Connected to city					0.255 [0.381]
Years of residency in district					-0.007 [0.018]
Connected to own district					1.433*** [0.519]
Rightwinger					-0.226 [0.973]
Leftwinger					0.137 [0.447]
Catholic					-0.242 [0.545]
Protestant					-0.597 [0.529]
Other religion					-0.38 [0.600]
Constant	13.033*** [0.292]	-1.877*** [0.341]	1.713*** [0.441]	1.771*** [0.507]	1.712** [0.690]
Observations	6087	6086	491	470	467
R-squared	0	0.53	0.02	0.02	0.05

*Notes:* Robust standard errors clustered on individuals in brackets  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 8: Individual determinants of trust and trustworthiness

Dependent variable	First mover's investment			Second mover's back transfer		
Age 31-45	1.458*	0.672	0.76	1.813	0.209	0.008
	[0.835]	[0.882]	[0.878]	[1.129]	[1.346]	[1.294]
Age 46-60	-0.968	-1.504	-1.525	1.059	-0.309	0.247
	[0.989]	[1.019]	[1.044]	[1.315]	[1.602]	[1.733]
Age 61-75	-4.268***	-4.288***	-3.486***	1.003	-0.3	0.743
	[1.071]	[1.153]	[1.303]	[1.533]	[1.742]	[2.098]
Age 76 and older	-5.723***	-5.660***	-5.172***	-0.891	-0.932	0.042
	[1.195]	[1.514]	[1.770]	[2.271]	[2.691]	[3.083]
Female	-0.493	-0.18	-0.152	-0.593	0.258	0.412
	[0.575]	[0.615]	[0.608]	[0.846]	[0.899]	[0.868]
Only Child	-0.127	-0.05	0.346	-1.056	-1.008	-0.859
	[0.907]	[0.931]	[0.856]	[1.531]	[1.633]	[1.577]
Tax Income		-0.054	0.029		0.153	0.188
		[0.072]	[0.068]		[0.168]	[0.170]
High skilled		2.658***	2.171***		-0.391	-0.407
		[0.577]	[0.576]		[0.799]	[0.814]
Married		0.513	0.865		2.308**	2.237**
		[0.677]	[0.647]		[1.081]	[1.015]
Children		0.571	0.455		0.712	0.965
		[0.370]	[0.374]		[0.736]	[0.761]
Foreigner		-1.599	-1.745		-0.686	-0.482
		[1.092]	[1.077]		[1.089]	[1.233]
Years of residency in city			-0.042*			0.054
			[0.025]			[0.036]
Connected to city			0.082			0.408
			[0.601]			[0.895]
Years of residency in district			0.032			-0.122***
			[0.027]			[0.042]
Connected to own district			-0.16			0.788
			[0.854]			[1.454]
Rightwinger			-5.567***			0.082
			[1.526]			[2.059]
Leftwinger			2.230***			0.649
			[0.670]			[1.022]
Catholic			-0.862			-3.532***
			[0.874]			[1.330]
Protestant			1.157			-1.346
			[0.828]			[1.335]
Other religion			0.889			-1.715
			[0.977]			[1.478]
First Mover's Investment				1.596***	1.621***	1.615***
				[0.037]	[0.038]	[0.038]
Constant	13.950***	13.118***	12.622***	2.098**	0.724	1.862
	[0.798]	[0.895]	[1.194]	[0.972]	[1.165]	[1.579]
Observations	5883	5637	5601	5096	4736	4703
R-squared	0.11	0.13	0.19	0.48	0.5	0.52

Notes: Robust standard errors clustered on individuals in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%