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What Affects General Trust? A Perspective from Institutional Economics and Empirical Evidence from China

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Abstract: Given the importance of trust, exploring what may affect trust then becomes attractive. The main purpose of this paper is to explain general trust quantitatively. This paper from, but not limited to, a perspective of original institutional economics elaborates what may affect general trust and proposes three reasonable hypotheses first, and then uses CGSS 2013 dataset to execute ordered logit regression of general trust on some selected variables. It is found that taken advantage has a strongly significant negative impact on general trust; fairness, moral satisfaction, opinion similarity, leisure time for rest and leisure time for learning have strongly significant positive impacts on general trust; public security problem, however, has a negative but not significant impact on general trust. These core explanatory variables improve predictive capability by 4 percent. This paper also compares general trust and trust in strangers, and regress trust in strangers on the same independent variables of general trust. There are two main differences: the first is that the negative impact of public security problem gets significant for trust in strangers; the second is that the significant impact of leisure time for resting gets negative for trust in strangers.

Keywords: general trust, trust in strangers, original institutional economics, fairness, morality, opinion, public security, leisure time

Introduction

A question that institutional economists are continuously paying close attention to is whence economic growth comes. (e.g., Kapp, 2011, p.34) Tradition of original institutional economics treats economy as a part of society and culture. (e.g., Veblen, [1899] 2005; Kapp, 2011, p. 17) "[…] Myrdal (1944) […] found that economic analysis can only become complete when embedded in the wider *social context*." (Elsner et al., 2015, Chapter 12, p. 342) Sociologist Granovetter (1985) also argues that economic behaviors are embedded in society. (Granovetter, 1985) So far, the impact of (general) trust on economic performance has been largely discussed. (e.g., Knack and Keefer, 1997; Bohnet and Huck, 2004; Paldam, 2009 in Svendsen and Svendsen, 2009; Algan and Cahuc, 2010; Peiró-Palomino and Tortosa-Ausina, 2013; Daniele and Geys, 2015) Generally speaking, most empirical research holds that trust has a significant positive influence on economic performance. Trust is an indispensible ingredient in socio-economic life. It is hard to imagine how tough life would be without basic interpersonal trust. Given the importance of trust, exploring what may affect trust then becomes attractive. This is not only the requirement for understanding the formation of trust, but also the center piece of the policy implication for trust (re)building and accumulation of social capital, since trust itself is not an operable concept. So far, as Delhey and Newton (2003) summarize, there already exist six theories of the origins of social trust. (Delhey

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and Newton, 2003) Empirical research digging into the determinants of trust has also emerged in social science. For example, research of Alesina and La Ferrara (2000) reveals that individual experiences and community characteristics affect general trust. (Alesina and La Ferrara, 2000). Blanco and Ruiz (2013) provide empirical evidence that insecurity has a significant negative effect on trust in others in Colombia. (Blanco and Ruiz, 2013) However, endowing general trust with an evolutionary-institutional theoretical background is not much. (Exceptions inc. e.g., Elsner and Schwardt, 2014, 2015)

The main task of this paper is to quantitatively explain general trust starting from a perspective of original institutional economics using Chinese General Social Survey 2013 data. The rest of this paper contains 5 sections: Section 1 provides an institutional way of thinking about general trust and proposes three hypotheses for what may affect general trust; Section 2 introduces the data set used for econometric analysis later and presents statistical description of variables used; Section 3 gives econometric model, and presents and analyzes results; Section 4 is a discussion on general trust and trust in strangers; Section 5 concludes.

1 Theoretical background and hypotheses

"General trust" is *individuals*' general trust from the view of the standard question on general trust, i.e., "generally speaking, would you say most people can be trusted" or some question similar, which can be found in various micro surveys, such as World Values Survey, European Social Survey, European Values Study, Chinese General Social Survey and so on. Therefore, in order to explore and test the influencing factors of general trust quantitatively, it would be helpful to consider via individuals and from inner feelings what may affect general trust since general trust cannot change without reasons and after all general trust dwells on psychological layer. The change of inner feelings about others' untrustworthy behaviors, such as aversions, disappointment, depression, anger, fear and so forth, may contribute a great deal to the change of general trust, which constructs, if it can be said like this, as the emotional foundation of general trust because humans are essentially social beings.

Humans are biological and, at the same time, social beings – this is also why Kapp (2011) prefers to call humans *homo institutionalis*, rather than *homo oeconomicus*. (Kapp, 2011, p. 66) Thus, a society is a society of individuals with institutional traits, and the interactions of individuals are embedded in interweaved institutions. We humans acquire (learn) institutional traits from our ancestors, our sages, and our early generations, and pass them to our later generations. In a word briefly, intergenerational transition of institutional traits is a precondition of institutional consecution and persistence.

Then, what are institutions? In his seminal monograph *The Theory of the Leisure Class: An Economic Study of Institutions*, Veblen ([1899] 2005) deems that "(t)he institutions are, in substance, prevalent habits of thought with respect to particular relations and particular functions of the individual and of the community" (Veblen, [1899] 2005, Chapter 8, p. 143-144) These habits of thoughts not merely guide individuals' behavior, but also direct in which way individuals think others *should* behave. Veblen ([1899] 2005) ever states that "(t)he evolution of society is substantially a process of mental adaptation on the part of individuals under the stress of circumstances which will no longer tolerate habits of thought formed under and conforming to a

different set of circumstances in the past" (Veblen, [1899] 2005, Chapter 8, p. 145). As the other side of the same coin, others' breaching habits of thought or norms of behavior leads to an individual's mental *inadaptation*, and at the same time causes aversion and damages general trust. What it boils down to is the interdependence of human behavior. Over an accumulation, sedimentation and evolution of hundreds and thousands of years, various norms of behavior have already permeated our daily life. Among those that people highly praise is fairness, truthfulness, keeping one's promise and so on and so forth, as well as *morals*.

The criticism of original institutional economics on neoclassical economics always involves the philosophical foundation of economics. Kapp (2011) criticizes neoclassical economics based on utilitarianism from Jeremy Bentham (Kapp, 2011, p. 19-20) of being "without explicit normative or moral values premises" (Kapp, 2011, p. 21). Humans are not pleasure machines (Hodgson, 2013); we have "moralische Gesetz in mir"[1] (Kant, [1788] 1968, p. 161). Original institutional economics (namely evolutionary institutional economics) inherits its philosophical foundation from American pragmatic philosophy which is founded and developed by Charles Peirce, William James and John Dewey. Dewey (1922) argues that "morals […] is ineradicably empirical" (Dewey, 1922, p. 295) and that "(m)orals means growth of conduct in meaning" (Dewey, 1922, p. 280).

"China is a society of ethics standard."[2] (Liang, [1949] 2005, Chapter 5, p. 70) Trustworthiness, truthfulness and other associated qualities as a moral norm appears in as early as Confucian classics of pre-Qin[3] philosophy in China, i.e. *Lun Yu* (namely *The Confucian Analects*) of Confucius and his disciples. For several examples, "Confucius remarked, 'I do not know how men get along without good faith. A cart without a yoke and a carriage without harness, - how could they go?' "[4] (Confucius and his disciples, translated by Ku, 1898, p. 12) "[…] 'My aim,' replied Confucius, 'would be to be a comfort to my old folk at home; to be sincere, and to be found trustworthy by my friends; and to love and care for my young people at home.'"[5] (Confucius and his disciples, translated by Ku, 1898, p. 37) "Confucius through his life and teaching taught only four thins: a knowledge of literature and the arts, conduct, conscientiousness and truthfulness."[6] (Confucius and his disciples, translated by Ku, 1898, p. 54)

What is important for trust to change is the information that derives from interactions about whether others are conforming to norms of conduct. More deeply, it is the nature of events (namely, trust-increasing or trust decreasing) that decides the direction of the change of general trust. In general, there are two ways of acquiring others' information about whether or not they are

[1] In one of his insightful and far-reaching three critiques, *Kritik der praktischen Vernunft* (i.e. *Critique of Practical Reason*), Kant (1788) wrote in German that "Zwei Dinge erfüllen das Gemüt mit immer neuer und zunehmender Bewunderung und Ehrfurcht, je öfter und anhaltender sich das Nachdenken damit beschäftigt: Der bestirnte Himmel über mir, und das moralische Gesetz in mir." (Kant, [1788] 1968, p. 161) Translated into English is "Two thins fill the mind with ever new and increasing admiration and reverence, the more frequently and persistently one's meditation deals with them: *the starry sky above me and the moral law within me*." (Translated by Pluhar, 2002, p. 203) It should be noted that Kant and Dewey hold quite different views on morals. (see Kant, [1785] 2002; Kant, [1788] 2002; Dewey, 1922) However, I will not elaborate on them here.

[2] Author's own translation. The original text in Chinese is "中国是伦理本位的社会". (Liang, [1949] 2005, Chapter 5, p. 70)

[3] Qin (秦) (221BCE ~207BCE) is a dynasty in Chinese history.

[4] The original text in Chinese is "子曰：'人而无信，不知其可也。大车无輗，小车无軏，其何以行之哉？'" ——《论语》

[5] The original text in Chinese is "子曰：'老者安之，朋友信之，少者怀之。'"——《论语》

[6] The original text is Chinese is "子以四教：文、行、忠、信。"——《论语》

conforming to norms of conduct: one is via personal interactions, the other is via non-interaction methods, such as observing, word by mouth, media using and so on. Contrast to experiences of direct interaction, feelings from acquiring others' interaction information via non-interaction methods relate to what Smith (1759) calls *sympathy* in his *The Theory of Moral Sentiments* (Smith, [1759] 1966). We image what we would feel if we were one of the interacting parties. Therefore, the first hypothesis is:

Hypothesis 1: Given other conditions, others' behavior of violating norms of conduct has a negative impact on general trust. The severer others' behavior of breaching norms of conduct, the more damage there is to general trust.

If the foregoing can be categorized into about incompatibility of habits of thought vs. behavior, then the forthcoming will be about discord of thought vs. thought.

It is a noteworthy phenomenon that a piece of social news often arouses netizens' widely and furious debate in social media nowadays. What they actually focus on is more than the social affair itself. More precisely, a piece of news reported merely provides an opportunity time-point when people can express their own opinions on all similar events. Further deeply, they are expressing their own value views orientation.

Admittedly, personal values highly relate to his cultural background (here, just call it common values), but they do not perfectly coincide. What is more, due to different angles and depth of commenting on an event, people may accentuate different criteria of value judgment while at the same time it is hard to tell any criteria involved is essentially and admittedly wrong in every possible sense since it may be reasonable to some extent. Expressing opinions is a process of externalization of values through language or communication. People compare others' opinions with those of themselves. Dewey (1922) ever states that "(d)iversity does not of itself imply conflict, but it implies the possibility of conflict, and this possibility is realized in fact." (Dewey 1922, p. 52) By the same token, difference of opinion does not definitely lead to decrease of general trust, but it is possible. Therefore, the second hypothesis is:

Hypothesis 2: Given other conditions, discord of opinions has a negative impact on general trust. The larger the degree of the discord of opinion, the more damage there is to general trust.

Hypothesis 1 and 2 both relate to information about interactions through either direct personal interactions or indirect non-personal interactions. It is conceivable that time or efforts devoted into acquiring this kind of information provide chances that general trust may change. Put another way, out of his personal habits or disposition, how much time one does *not* contribute to acquiring information delivered from interactions may have an impact on general trust.

However, to interact or not to interact can both increase general trust. On one hand, when people have social activities, they more likely choose those with whom they *like* to interact, those with whom they often have a rapport, share similar interest and opinion, and do not behave untrustworthily to them. From this standpoint, social activities can sustain general trust - this is a positive consequence from peer selection. On the other hand, those who do not interact often or do not pay much attention to information of others' interactions can also have high general trust because their personal disposition or habits of not interacting with others prohibits information

sources delivering untrustworthy affairs happening in society, and then they do not know much about those untrustworthy affairs in society. Thus, general trust may be stable and probability be kept high. Since hypothesis 1 and 2 have already caught the impact of information about interactions (thought - behavior interaction and thought – thought interaction), what will be investigated is the latter, namely the impact of not to interact. Therefore, the third hypothesis is:

Hypothesis 3: Given other conditions, time not being paid to acquiring information about interactions has an impact on general trust. The more time one spends not to interact, the higher his general trust.

In a short summary, what may affect general trust is considered from three aspects: a) response to others' behavior; b) response to others' opinion; c) no information. Also see Figure 1.

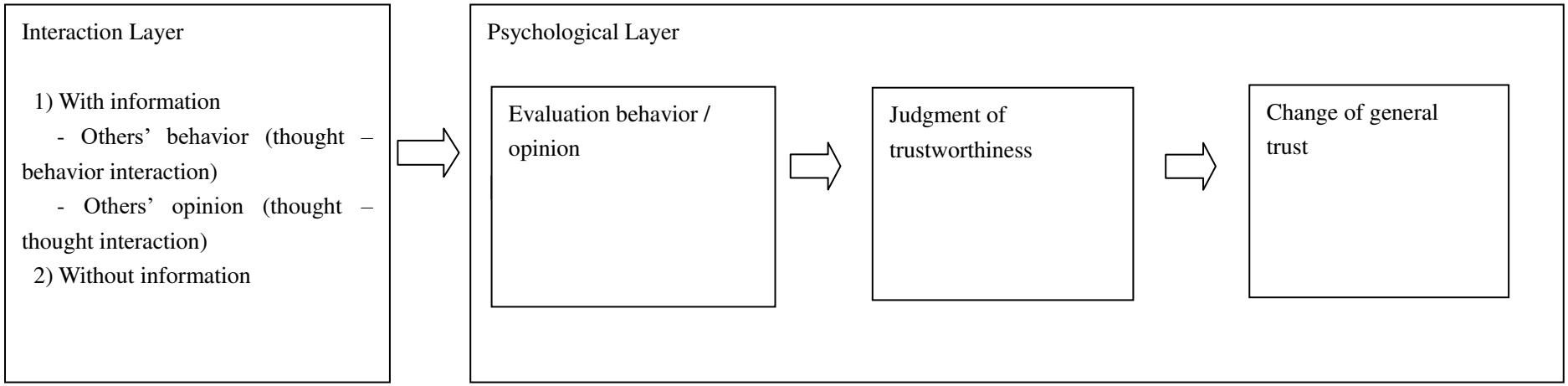

Figure 1. Mechanism of general trust change.

2 Data and descriptive statistics

Data used in this paper is from Chinese General Social Survey 2013 (CGSS 2013). "CGSS is the first nation-wide, comprehensive and continuous social survey program in China."[1] (CGSS, 2013, Questionnaire B) CGSS has been conducted in China since 2003. (CGSS, 2013, Questionnaire B. For more information about CGSS, also see, e.g., Bian and Li, 2012) CGSS 2013 contains two questionnaires, Questionnaire A and Questionnaire B, which comprise not all the same questions. Questionnaire A contains four sections, section A, B, C and Z, while Questionnaire B contains section A, B, D and Z. What is used in this paper is CGSS 2013 Questionnaire B, since one variable of interest is from section D of Questionnaire B but is not included in Questionnaire A. (For a glance at the questions used in this paper, see Appendix A) Both CGSS 2013 Questionnaire A and CGSS 2013 Questionnaire B are in the same dataset. CGSS 2013 dataset contains 11438 observations in total, within 5772 observations for CGSS 2013 Questionnaire A and 5666 observations for CGSS 2013 Questionnaire B. From CGSS 2013 Questionnaire B, taken advantage, fairness, moral satisfaction and public security problem are chosen for hypothesis 1, opinion similarity is chosen for hypothesis 2, and leisure time for rest and leisure time for learning are for hypothesis 3, besides other two dependent variables and seven control variables.[2] When measuring time of no interaction information, the proxy / proxies are chosen to reflect that non-interaction is of an individual's own accord in order to avoid the endogenous problem of reverse causality in econometric model. After deleting observations with missing values, 5203 observations, about 92% observations, are left for further analysis. Table 1 presents descriptive statistics for variables used in this paper. Therein, age is got by subtracting 2013, the survey year, from the birth year. and mandarin level is measured by the average score of mandarin listening and mandarin speaking in order to unity measurement standard with other five-point Likert type items. It can be seen that most of the variables used are Likert type items. Additionally, moral satisfaction is reverse scored since in the questionnaire, relatively high moral satisfaction was valued a relatively low score. The rest variables are presented as they are.

[1] Author's own translation.

[2] Two dependent variables are general trust and trust in strangers, respectively. General trust is the dependent variable in the econometric analysis in Section 3 in this paper, while trust in strangers is the dependent variable in the econometric analysis in Section 4 in this paper.

Table 1: Descriptive statistics.

Variables	Descriptive statistics
Dependent variables	
General trust (A33; a33)	
Strongly disagree (=1)	200
Disagree (=2)	1304
Neither (=3)	845
Agree (=4)	2577
Strongly agree (=5)	277
Min	1.000
1st quantile	2.000
Median	4.000
Mean	3.274
3rd quantile	4.000
Max	5.000
Core explanatory variables	
Taken advantage (A34; a34)	
Strongly disagree (=1)	228
Disagree (=2)	1603
Neither (=3)	1205
Agree (=4)	1960
Strongly agree (=5)	207
Min	1.000
1st quantile	2.000
Median	3.000
Mean	2.915
3rd quantile	4.000
Max	5.000
Fairness (A35; a35)	
Completely unfair (=1)	384
Unfair (=2)	1529
Neither (=3)	1174
Fair (=4)	1980
Completely fair (=5)	136
Min	1.000
1st quantile	2.000
Median	3.000
Mean	2.991
3rd quantile	4.000
Max	5.000
Moral Satisfaction (D1; d1)	
Very dissatisfied (=1)	197
Dissatisfied (=2)	1004

Neither (=3)	2179
Satisfied (=4)	1725
Very satisfied (=5)	98
Min	1.000
1st quantile	3.000
Median	3.000
Mean	3.101
3rd quantile	4.000
Max	5.000
Public security problem (B10; b101, b102, b103)	
First problem to be settled = Public Security Problem	238
Second problem to be settled = Public Security Problem	395
Third problem to be settled = Public Security Problem	534
sum	1167
Opinion similarity (B4; b4)	
Very rarely (=1)	39
Rarely (=2)	513
Average (=3)	1903
Frequently (=4)	2500
Very frequently (=5)	248
Min	1.000
1st quantile	3.000
Median	4.000
Mean	3.462
3rd quantile	4.000
Max	5.000
Leisure time - Rest / Relax (A31; a312)	
Never (=1)	131
Seldom (=2)	804
Sometimes (=3)	1813
Often (=4)	2096
Very frequently (=5)	359
Min	1.000
1st quantile	3.000
Median	3.000
Mean	3.336
3rd quantile	4.000
Max	5.000
Leisure time - Learn (A31; a313)	
Never (=1)	2415
Seldom (=2)	1440
Sometimes (=3)	809
Often (=4)	439
Very frequently (=5)	100

Min	1.000
1st quantile	1.000
Median	2.000
Mean	1.918
3rd quantile	3.000
Max	5.000
Control variables	
Gender (A2 / a2)	
Male	2640
Female	2563
Age (A3; 2013 - a3a)	
Age group 1 [18, 33)	1063
Age group 2 [33, 48)	1574
Age group 3 [48, 64)	1624
Age group 4 [64, 96]	942
Min	18.00
1st quantile	35.00
Median	47.00
Mean	47.75
3rd quantile	60.00
Max	96.00
Subjective social class - 14 years old (A43d; a43d)	
Min	1.000
1st quantile	2.000
Median	3.000
Mean	3.108
3rd quantile	4.000
Max	10.000
Current highest education	
≤ Elementary education	2020
Elementary education	1061
Secondary education	2575
Tertiary education	903
Mandarin level (A49,A50; (a49+a50)/2)	
Min	1.000
1st quantile	3.000
Median	3.500
Mean	3.493
3rd quantile	4.000
Max	5.000
Happiness (A36; a36)	
Very unhappy (=1)	76
Unhappy (=2)	377
Neither (=3)	995

Happy (=4)	3058
Very happy (=5)	697
Min	1.000
1st quantile	3.000
Median	4.000
Mean	3.754
3rd quantile	4.000
Max	5.000
Precepts “choice phobia” (B3; b3)	
Strongly disagree (=1)	232
Disagree (=2)	1510
Fairly (=3)	2408
Agree (=4)	959
Strongly agree (=5)	94
Min	1.000
1st quantile	2.000
Median	3.000
Mean	2.841
3rd quantile	3.000
Max	5.000
Sample size	5203

Note: Author’s own calculation using R. (R Core Team, 2017) Data source: CGSS 2013. CGSS 2013 Questionnaire B has 5666 observations in total. 5203 observations are left after deleting missing values. What is before the semicolon in every parenthesis after each variable in Table 1 is the question number in CGSS 2013 Questionnaire B; what is after the semicolon is the variable name in original CGSS 2013 dataset (or how a new generated variable in Table 1 is calculated via the variable in original CGSS 2013 dataset). For original questions in questionnaire, see Appendix A. The CGSS 2013 data is of Stata format. R package foreign (R Core Team, 2016) can be used to import Stata format data into R for data analysis.

3 Econometric model and results

3.1 Econometric model

Considering the intrinsic ordered nature of the dependent variable *GeneralTrust*, ordered logit regression is adopted for econometric analysis to explore causality.[1] The ordered logit model with main effects is set as below[2]:

$$\begin{aligned}\text{logit}[P(GeneralTrust \le j)] &= -(\alpha_j + \beta_1 TakenAdvantage + \beta_2 Fairness + \beta_3 MoralSatisfaction \\ &+ \beta_4 PublicSecurityProblem + \beta_5 OpinionSimilarity + \beta_6 LeisureTimeRest \\ &+ \beta_7 LeisureTimeLearn + \boldsymbol{X\gamma}) \qquad (j = 1,2,3,4)\end{aligned}$$

α_j (j = 1,2,3,4) are intercepts. $\boldsymbol{X}$ is a matrix of which the columns are control variables. $\boldsymbol{\gamma}$ is coefficient vector for control variables. Control variables are respectively a gender dummy (female=1, male=0), 3 age-group dummies (age group 2 = 1, otherwise = 0; age group 3 = 1, otherwise = 0; age group 4 = 1, otherwise = 0), 3 current-highest-education dummies (Elementary education = 1, otherwise = 0; Secondary education = 1, otherwise = 0; Tertiary education = 1, otherwise = 0), subjective social class at 14 years old, happiness, mandarin level and precepts "choice phobia". Therein, subjective social class at 14 years old is controlled as a proxy of the effects of family of origin. Happiness is controlled as a proxy of current life status. Precepts "choice phobia" reflects personality to some degree. Additionally, being independent variables (either core explanatory variables or control variables), almost all five-point Likert type items are treated as single predictors in order to avoid information loss and/or difficulty in explanation, despite some debates about Likert data.[3]

3.2 Pearson correlation matrix

Before econometric analysis is implemented, Pearson correlation matrix of most independent variables are presented in Table 2 to detect the pair-wise linear relations between them.[4] From Table 2, the absolute value of each correlation coefficient is below 0.4. The strongest linear correlation is between fairness and moral satisfaction (about 0.32), the second strongest is between fairness and happiness (about 0.29). Hence, no strong linear correlation exists between any two independent variables shown in Table 2.

[1] For more knowledge about analysis of ordinal categorical data, see e.g., Agresti, 2010, 2nd edition.

[2] The signs on the right hand side of the model are adapted according to the latent model estimated latter using the R-package VGAM (Yee, 2017), a package which is used for economic analysis in this paper, in order for my model and the results outputted by VGAM to be consistent in explanation.

[3] For more discussion about whether parametric statistics can be used with Likert type items, see, e.g., Norman, 2010. Norman (2010) argues that "(p)arametric statistics can be used with Likert data, with small sample sizes, with unequal variances, and with non-normal distributions". (Norman, 2010, pp. 631) In the area of economics, Likert type item is also treated as a single independent variable in top journals. For example, Blanco and Ruiz (2013) use insecurity which is a scale type item as a single explanatory variable. (Blanco and Ruiz, 2013)

[4] Since Pearson's r is robust to non-normality and ordinal data (Norman, 2010), it is adopted to measure the relationship between these variables, rather than using Spearman's rho or Kendall's tau b.

Table 2. Pearson correlation coefficients matrix

	Taken advantage	Fairness	Moral satisfaction	Opinion similarity
Taken advantage	1	-0.11946266	-0.11455167	-0.079707911
Fairness	-0.11946266	1	0.32214294	0.081344328
Moral satisfaction	-0.11455167	0.32214294	1	0.083766089
Opinion similarity	-0.07970791	0.08134433	0.08376609	1
Leisure time - Rest	-0.05744164	0.02621836	-0.01470889	0.078130124
Leisure time - Learn	-0.00412774	-0.02531845	-0.10046645	0.006356659
Happiness	-0.11046841	0.28837692	0.12497735	0.128420486
Precepts "choice phobia"	0.06293303	-0.03638754	0.02244971	-0.017325233
	Leisure time - Rest	Leisure time - Learn	Happiness	Precepts “choice phobia”
Taken advantage	-0.05744164	-0.00412774	-0.11046841	0.06293303
Fairness	0.02621836	-0.025318454	0.28837692	-0.03638754
Moral satisfaction	-0.01470889	-0.100466449	0.12497735	0.02244971
Opinion similarity	0.07813012	0.006356659	0.12842049	-0.01732523
Leisure time - Rest	1	0.13242894	0.08271958	-0.01474469
Leisure time - Learn	0.13242894	1	0.07437726	-0.08584193
Happiness	0.08271958	0.074377259	1	-0.04617063
Precepts “choice phobia”	-0.01474469	-0.085841929	-0.04617063	1

Note: Author’s own calculation using R. (R Core Team, 2017) Data source: CGSS 2013

3.3 Results

Three models of ordered logit regression of general trust are implemented: 1) null model which only regresses on intercepts; 2) control model which regresses on both intercepts and control variables; and 3) full model which contains core explanatory variables besides intercepts and control variables. Results are integrated in Table 3 and the sample regression function of the full model is below:

$$\begin{aligned}\overbrace{\text{logit}[P(GeneralTrust \leq j)]}\\ &= -(\alpha_j - 0.25TakenAdvantage + 0.55Fairness + 0.24MoralSatisfaction\\ &- 0.05PublicSecurityProblem + 0.26OpinionSimilarity\\ &+ 0.16LeisureTimeRest + 0.10LeisureTimeLearn - 0.11GenderFemale\\ &+ 0.26AgeGroupTwo + 0.46AgeGroupThree + 0.48AgeGroupFour\\ &- 0.07SocialClassFourteen - 0.07HighestEduElementary\\ &- 0.16HighestEduSecondary - 0.06HighestEduTertiary\\ &+ 0.07Mandarin + 0.20Happiness + 0.11PreceptsChoicePhobia) \quad (j\\ &= 1,2,3,4; \alpha_1 = -0.89, \alpha_2 = -3.42; \alpha_3 = -4.25; \alpha_4 = -7.70)\end{aligned}$$

Significance of control variables From Table 3, gender as female has significant negative impact on general trust compared with males, both in control model and in full model, while in the letter this negative impact gets more significant. Age has strongly significant positive impact on general trust, which is consistent with other research. Social class at 14 years old shows much stronger significant negative impact on general trust in the full model than in the control model. What is surprising is that current highest education, in general, does not show significant positive impact on general trust both in the control model and in the full model, which contrasts with much of other research. On the contrary, education here has a negative, but not significant in general (besides highest education is secondary education), impact on general trust. Mandarin level has a positive impact on general trust and this impact is more significant in the full model than in the control model. Precepts "choice phobia" has a positive impact on general trust and this impact is much more significant in the full model than in the control model.

Significance of core explanatory variables From Table 3, consistent with expectation, taken advantage has a strongly significant negative impact on general trust, and fairness, moral satisfaction, opinion similarity, leisure time for rest and leisure time for learning all have strongly significant positive impact on general trust. What is surprising is that even though public security problem has a negative impact on general trust, this impact is however not significant even at significance level of 0.1.

Log odds of core explanatory variables Among the seven core explanatory variables, fairness has the biggest influence on odds holding other variables constant. Given a particular level of general trust, the log odds of the probability higher than or equal to this particular level against the probability lower than this particular level increases 0.73 when fairness increases one unit (improves one level). (See exponentiated estimate in Table 3) Then come opinion similarity, moral satisfaction, leisure time for rest and leisure time for learning which improve log odds by 0.29, 0.27, 0.18 and 0.11, respectively. In contrast, public security problem and taken advantage decrease odds by 0.05 and 0.21, respectively. That is more, the full model improves predictive

capability by about 4 percentage compared with the control model.

Likelihood ratio test After testing significance of single independent variables (Table 3), likelihood ratio tests are implemented for null model vs. control model, null model vs. full model, and control model vs. full model respectively in order to see the significance of the whole model. (See Table 4) The three tests are all significant at significance level of 0.001. This also indicates that the whole model holds.

Table 3: Ordered logit regression (Dependent variable: general trust)

	Null model	Control model		Full model	
	Estimate (Std. Error)	Estimate (Std. Error)	Exponentiated estimate	Estimate (Std. Error)	Exponentiated estimate
Intercepts					
Intercept 1	3.21948 **** (0.07211)	1.27136 **** (0.21627)		-0.89385 *** (0.29352)	
Intercept 2	0.89993 **** (0.03058)	-1.09674 **** (0.20922)		-3.42395 **** (0.29151)	
Intercept 3	0.19473 **** (0.02786)	-1.83265 **** (0.21020)		-4.24753 **** (0.29352)	
Intercept 4	-2.87827 **** (0.06175)	-5.00599 **** (0.22190)		-7.69174 **** (0.30842)	
Core explanatory variables					
Taken advantage				-0.25446 **** (0.02937)	0.7753382
Fairness				0.54733 **** (0.02929)	1.7286241
Moral satisfaction				0.24087 **** (0.03338)	1.2723611
Public security problem (=0, reference)				---	---
Public security problem (=1)				-0.04965 (0.06441)	0.9515621
Opinion similarity				0.25565 **** (0.03564)	1.2913030

Leisure time - rest			0.16421**** (0.03034)	1.1784674
Leisure time - learn			0.10308 **** (0.03020)	1.1085805
Control variables				
Gender - male (reference)	---	---	---	---
Gender - female	-0.09152 * (0.05386)	0.9125398	-0.11107 ** (0.05533)	0.8948784
Age group 1 - [18, 33) (reference)	---	---	---	---
Age group 2 - [33,48)	0.22873 *** (0.07594)	1.2570085	0.25774 **** (0.07818)	1.2940018
Age group 3 - [48,64)	0.45476 **** (0.07973)	1.5757900	0.41945 **** 0.08227	1.5211211
Age group 4 - [64,96]	0.61366 **** (0.09643)	1.8471799	0.48254 **** (0.09903)	1.6201797
Social class at 14 years old	-0.03726 ** (0.01565)	0.9634208	-0.06551 **** (0.01610)	0.9365935
Highest education - lower than Elementary education (reference)	---	---	---	---
Highest education – Elementary education	-0.01549 (0.09850)	0.9846276	-0.06640 0.10072	0.9357604
Highest education – Secondary education	-0.18271 * (0.09680)	0.8330114	-0.15954 0.10045	0.8525326
Highest education – Tertiary education	-0.05898 (0.12054)	0.9427233	-0.06008 0.12948	0.9416937

Mandarin level		0.02316 0.03215	1.0234328	0.06773 ** (0.03317)	1.0700758
Happiness		0.46195 **** 0.03225	1.5871692	0.19682 **** (0.03425)	1.2175275
Precepts “choice phobia”		0.06081 * (0.03149)	1.0626935	0.10648 **** (0.03235)	1.1123564
Number of iterations	1	5		5	
Pseudo R square					
MacFadden[1]	---	0.021487		0.07620806	
Cox & Snell[2]	---	0.05317206		0.1761646	
Negelkerke[3]	---	0.05317206		0.1761646	
Log-likelihood	-6615.184	-6473.044		-6111.054	
Predictive capability	0.4952912	0.5024025		0.5414184	
Name of linear predictors		logit(P[Y≥2]), logit(P[Y≥3]), logit(P[Y≥4]), logit(P[Y≥5])			
Number of observations		5203			

Data source: CGSS 2013. Significance code: 0~0.001 ****; 0.001~0.01***; 0.01~0.05**; 0.05~0.1*. Ordered logit regressions are implemented with R package VGAM. (Yee, 2017) For more knowledge of using R for econometric analysis, see, e.g., Heiss, 2016.

[1] $R^2_{MacFadden} = 1 - \ln L(M_{Full})/\ln L(M_{Null})$
[2] $R^2_{Cox\&Snell} = 1 - [L(M_{Null})/L(M_{Full})]^{2/N}$
[3] $R^2_{Nagelkerke} = \{1 - [L(M_{Null})/L(M_{Full})]^{2/N}\}/[1 - L(M_{Null})^{2/N}]$

Table 4. Likelihood ratio test – general trust.

		Degree of freedom	Log likelihood	Difference of Degree of freedom	Chi square	Pr (>Chi square)
Full model vs. null model	full model	20790	-6111.1	---	---	---
	null model	20808	-6615.2	18	1008.3	< 2.2e-16 ****
Control model vs. null model	control model	20797	-6473.0	---	---	---
	null model	20808	-6615.2	11	284.28	< 2.2e-16 ****
Full model vs. control model	full model	20790	-6111.1	---	---	---
	control model	20797	-6473.0	7	723.98	< 2.2e-16 ****

Significance code: 0~0.001 ****; 0.001~0.01***; 0.01~0.05**; 0.05~0.1*. Implemented using R package VGAM. (Yee, 2017)

4 Discussion: general trust vs. trust in strangers

When talking about general trust, scholars want to know how "general" general trust is, namely the radius of general trust. An argument is that it is just because general trust exceeds family, kinship and friends and permeates into strangers general trust can become "general". Then, to which degree does general trust relates to trust in strangers? Can those that can explain general trust also explain trust in strangers? If yes, to what degree?

CGSS 2013 Questionnaire B also contains a question about trust in strangers. (CGSS 2013, Questionnaire B) Table 5 is a contingency table between general trust and trust in strangers at each level. Pearson correlation coefficient between general trust and trust in strangers is about 0.31. Table 6 presents ordered logit regressions of trust in strangers on independent variables that are the same with those of ordered logit regressions of general trust shown in Table 5. Let's compare the full model in Table 4 and Table 5.

Control variables In the full model in Table 6, female still has a negative impact, but not as significant as that in Table 5. What is surprising is that the positive impact of age groups gets not significant any more in contrast to Table 4. The impact of subjective social class at 14 years old changes from negative in Table 5 to positive in Table 6, still significant but not that strongly. The impact of current education level gets a little bit more complicated. In the full model in Table 6, as to current education level, compared with the category of lower than elementary education, elementary education and secondary education have significant negative impact on trust in strangers, even at different significance level, while tertiary education have a positive but not significant impact on trust in strangers. Mandarin level still has a significant positive impact in Table 5, the same with that in Table 6. Also precepts "choice phobia" keeps its significant positive impact. However, the impact of happiness on trust in strangers in Table 5 becomes both negative and insignificant, in contrast to that in Table 6.

Core explanatory variables In Table 6, taken advantage has a negative impact on trust in strangers, but not as significant as in Table 5. Fairness and moral satisfaction still have a strongly significant positive impact on trust in strangers. In contrast to impact on general trust in Table 5, the negative impact public security problem on trust in strangers becomes much more significant in Table 6. Even thought the positive impact of opinion similarity in Table 6 is not as strong as in Table 5, it is still very significant. As to leisure time, the significant impact of leisure time in Table 5 change from positive to negative in Table 6, with a less significant influence, while the significant positive impact of leisure time for learning keeps consistent more or less in Table 5 and Table 6. For trust in strangers, moral satisfaction contributes to the change of log odds most. Fairness comes closely after moral satisfaction. Then is public security problem.

Likelihood ratio tests Likelihood ratio tests are also implemented for null model vs. control model, null model vs. full model, and control model vs. full model respectively when dependent variable is trust in strangers. (See Table 7) The three tests are all significant at significance level of 0.001. Thus, the whole model holds.

In general, what are used to explain general trust in this paper can also explain trust in strangers. However, even though most of the core explanatory variables in Table 6 have the same impact direction and significance overall, the full model in Table 6 only improve the predictive capability by 0.4 percentage compared with the control model in Table 6. The predictive capability of the full model in Table 6 is only about 45.3%. So, general trust to a large extend does not refers to trust in strangers at least for China.

Table 5. Contingency table: general trust vs. trust in strangers.

			Trust in strangers				
			Strongly distrust (=1)	Distrust (=2)	Fair (=3)	Trust (=4)	Strongly trust (=5)
		Sum	393	2333	1520	916	41
General trust	Strongly disagree (=1)	200	91	73	32	3	1
	Disagree (=2)	1304	102	852	267	79	4
	Neither (=3)	845	43	352	371	74	5
	Agree (=4)	2577	119	970	787	693	8
	Strongly agree (=5)	277	38	86	63	67	23

Data source: CGSS 2013. N=5203.

Table 6: Ordered logit regression (Dependent variable: trust in strangers)

	Null model	Control model		Full model	
	Estimate (Std. Error)	Estimate (Std. Error)	Exponentiated estimate	Estimate (Std. Error)	Exponentiated estimate
Intercepts					
Intercept 1	2.50464 **** (0.05246)	1.83095 **** (0.20885)		0.53637 * (0.28060)	
Intercept 2	-0.09579 **** (0.02776)	-0.79548 **** (0.20560)		-2.17018 **** (0.28055)	
Intercept 3	-1.48993 **** (0.03578)	-2.20728 **** (0.20772)		-3.63008 **** (0.28348)	
Intercept 4	-4.83551 **** (0.15679)	-5.56175 **** (0.25821)		-7.02357 **** (0.32313)	
Core explanatory variables					
Taken advantage				-0.05723 ** (0.02831)	0.9443786
Fairness				0.26958 **** (0.02800)	1.3094188
Moral satisfaction				0.27904 **** (0.03256)	1.3218666
Public security problem (=0, reference)				---	---
Public security problem (=1)				-0.15309 ** (0.06241)	0.8580534
Opinion similarity				0.10050 *** (0.03450)	1.1057279

Leisure time - rest			-0.06328 ** (0.02937)	0.9386773
Leisure time - learn			0.08734 *** (0.02905)	1.0912657
Control variables				
Gender - male (reference)	---	---	---	---
Gender - female	-0.11708 ** (0.05288)	0.8895164	-0.09271 * (0.05350)	0.9114547
Age group 1 - [18, 33) (reference)	---	---	---	---
Age group 2 - [33,48)	-0.06630 (0.07529)	0.9358479	-0.07186 (0.07639)	0.9306642
Age group 3 - [48,64)	-0.05095 (0.07857)	0.9503238	-0.08043 (0.07998)	0.9227230
Age group 4 - [64,96]	0.10496 (0.09362)	1.1106658	0.06285 (0.09511)	1.0648680
Social class at 14 years old	0.04607 *** (0.01533)	1.0471500	0.03803 ** (0.01554)	1.0387658
Highest education - lower than Elementary education (reference)	---	---	---	---
Highest education – Elementary education	-0.20406 ** (0.09532)	0.8154096	-0.21048 ** (0.09608)	0.8101970
Highest education – Secondary education	-0.21531 ** (0.09390)	0.8062943	-0.16256 * (0.09619)	0.8499691
Highest education – Tertiary education	0.12333 (0.11697)	1.1312624	0.16490 (0.12424)	1.1792761

Mandarin level		0.05662 * (0.03149)	1.0582487	0.08292 *** (0.03198)	1.0864514
Happiness		0.12772 **** (0.03150)	1.1362403	-0.01461 (0.03352)	0.9854980
Precepts “choice phobia”		0.02789 (0.03081)	1.0282862	0.04239 (0.03115)	1.0433027
Number of iterations	1	4		5	
Pseudo R square					
MacFadden	---	0.006568229		0.02676166	
Cox & Snell	---	0.01639264		0.06512628	
Negelkerke	---	0.01639264		0.06512628	
Log-likelihood	-6546.49	-6503.492		-6371.296	
Predictive capability	0.4483952	0.4489717		0.4532001	
Name of linear predictors		logit(P[Y≥2]), logit(P[Y≥3]), logit(P[Y≥4]), logit(P[Y≥5])			
Number of observations		5203			

Data source: CGSS 2013. Significance code: 0~0.001 ****; 0.001~0.01***; 0.01~0.05**; 0.05~0.1*. Ordered logit regressions are implemented with R package VGAM. (Yee, 2017)

Table 7. Likelihood ratio test – trust in strangers.

		Degree of freedom	Log likelihood	Difference of Degree of freedom	Chi square	Pr (> Chi square)
Full model vs. null model	full model	20790	-6371.3	---	---	---
	null model	20808	-6546.5	18	350.39	< 2.2e-16 ****
Control model vs. null model	control model	20797	-6503.5	---	---	---
	null model	20808	-6546.5	11	85.998	1.01e-13 ****
Full model vs. control model	full model	20790	-6371.3	---	---	---
	control model	20797	-6503.5	7	264.39	< 2.2e-16 ****

Significance code: 0~0.001 ****; 0.001~0.01***; 0.01~0.05**; 0.05~0.1*. Implemented with R package VGAM. (Yee, 2017)

5 Conclusions

The main aim of this paper is to quantitatively explore the determinants of general trust. This paper from a perspective of original institutional economics provides a theoretical frame first and then proposes three hypotheses. Subsequently, CGSS 2013 dataset is used to implement ordered logit regression of general trust on its possible determinants. As to core explanatory variables, it is found that fairness, moral satisfaction, opinion similarity, leisure time for rest and leisure time for learning have significant a positive impact on general trust, while taken advantage has a significant negative impact on general trust. However, even though public security problem has a negative impact on general trust, its impact is not significant. What is more, these core explanatory variables improve predictive capability by 4 percent.

Additionally, this paper also compares general trust and trust in strangers under same dataset by doing ordered logit regressions of trust in strangers on the same independent variable of general trust. It is found that taken advantage, fairness, moral satisfaction, opinion similarity, leisure time for learning still have significant impact on trust in strangers, with consistent impact directions with their impacts on general trust. What is different is that it is fairness that has the biggest influence on general trust, while it is moral satisfaction that has the biggest influence on trust in strangers. What is noticeable is that the negative impact of public security problem is not significant on general trust, but gets significant on trust in strangers. The impact of leisure time for rest is significant both for general trust and trust in strangers, but with opposite directions. In addition, the same core explanatory variables to a quite different degree improve the predictive capability in the general-trust model and in the trust-strangers model.

It should be noted that even though this paper from three aspects explores what affects general trust, not every aspect is suitable for policy implication. Actually, only the first aspect, namely violating norms of conduct, is appropriate for policy implication. For example, designing more fair mechanisms, educating people to behave morally more, providing more secure public environment, and strengthening legislation and law-enforcement are among the alternatives to improve general trust, as well as trust in strangers.

Appendix A: Selected questions from CGSS 2013 Questionnaire B.[1]

Section A:

A2. Gender

Male …… 1

Female …… 2

A3. What is your birth date?

____Year__Month__Day

A31 In the last year, did you often do the things below in your leisure time?

	Never	Seldom	Sometimes	Often	Very frequently
1. Social activities	1	2	3	4	5
2. Rest and relax	1	2	3	4	5
3. Learn	1	2	3	4	5

A33. Generally speaking, do you agree that most people can be trusted in this society?

Strongly disagree …… 1

Disagree …… 2

Neither …… 3

Agree …… 4

Strongly agree …… 5

A34. In general, do you agree that in this society others would try to take advantage of you if you are not careful enough?

Strongly disagree …… 1

Disagree …… 2

Neither …… 3

[1] Author's own translation. Original questionnaire is in Chinese.

Agree …… 4

Strongly agree …… 5

A35. Generally speaking, do you think the current society is fair?

Completely unfair …… 1

Unfair …… 2

Neither …. 3

Fair …. 4

Completely fair …… 5

A36. In general, do you think you are living happily?

Very unhappy …… 1

Unhappy …… 2

Neither …… 3

Happy …… 4

Very happy …… 5

A43. In our society, some people are on upper class of the society while some are on lower class. […] The highest score '10' represents the highest class while the lowest score '1' refers to the lowest class.

……

A43c. Which class do you think your will be at 10 years later?

A43d. Which class do you think your family was at when you were 14 years old?

A49. How good do you think your mandarin listening?

Completely cannot understand …... 1

Poor …… 2

Fair …… 3

Good …… 4

Very good …… 5

A50. How good do you think your mandarin speaking?

Completely cannot speak …... 1

Poor …… 2

Fair …… 3

Good …… 4

Very good …… 5

Section B:

B3. Do you agree with the statement that "It is very hard for me to choose what precepts to follow."

Strongly disagree …… 1

Disagree …… 2

Neither …… 3

Agree …… 4

Strongly agree …… 5

B4. According to your general impression, how often do you hold the same opinions and views on some important things with the public?

Very rarely …… 1

Rarely …… 2

Average …… 3

Frequently …… 4

Very frequently …… 5

B6. Generally speaking, do you trust strangers in current society?

Strongly distrust …… 1

Distrust …… 2

Neither …… 3

Trust …… 4

Strongly trust …… 5

B10. In the social problems below, which one do you think is the most prior to be settled?

	……

	4. Public security problem. ……
1. The first to be settled	
2. The second to be settled	
3. The third to be settled	

Section D:

D1. To what degree are you satisfied with the moral status in our country?

Very satisfied …… 1

Satisfied …… 2

Neither …… 3

Dissatisfied …… 4

Very dissatisfied …… 5

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