DOES ECONOMIC PROSPERITY BREED TRUST?

Markus Brueckner, Alberto Chong
and Mark Gradstein

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Monaster Center for
Economic Research
Ben-Gurion University of the Negev
P.O. Box 653
Beer Sheva, Israel

Fax: 972-8-6472941
Tel: 972-8-6472286

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Abstract

We explore whether national economic prosperity enhances mutual generalized trust. This is done using panel data of multiple waves of the World Values Surveys, whereby national income levels are instrumented for using exogenous oil price shocks. We find significant and substantial effects of national income on the level of trust in the economy. In particular, a one percent increase in national income tends to cause an average increase of one percentage point (or more) in the likelihood that a person becomes trustful. One possible rationalization for this, exhibited in a simple model, is that perceived prosperity signals that many people are trustworthy.

Keywords: Generalized trust; national income; oil price shocks

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* Brueckner: Department of Economics, University of Queensland, Australia; Chong: Department of Economics, Georgia State University, USA; Gradstein: Department of Economics, Ben Gurion University, Israel. Acknowledgments to be added.

1. Introduction

Social capital and, in particular, the level of trust in an economy, has been shown to be correlated with economic performance, specifically, with economic growth, see the seminal work Knack and Keefer, 1997, Zak and Knack, 2001, and a survey Guiso et al., 2008, as well as the more recent Algan and Cahuc, 2013, Bjornskov, 2012.[1] While this relationship has been mostly exhibited in a cross national setting, Dincer and Uslaner, 2010, find positive associations between trust and economic growth across the US states as well.

Generalized trust (i.e., trust in anonymous individuals, as opposed to trust among familiar people) may positively affect welfare in a society through better cooperation, i.e. trust is instrumental in avoiding prisoner dilemma outcomes. See Banfield, 1958, for a pioneering work; effects of trust on various aggregate outcomes have been explored in, for example, Aghion et al., 2010, Bjornskov, 2009, 2010, Bjornskov and Meon, 2013, Bjornskov and Svendsen, 2013. The documented importance of trust implies that there is potential interest in studying its nation-wide determinants. This has been done in, for example, Bjornskov, 2006, although identification obstacles in disentangling causality have been acknowledged by the author.

One important question in this regard is whether economic prosperity and, in particular, higher national income breeds trust. Indeed, already in Banfield, 1958, economic backwardness and poverty are viewed not only as a consequence, but also as a cause of distrust. While some positive indications on the causal effect of income on trust are provided in Bjornskov, 2006, this question has received relatively little attention so far. The recent

[1]Fukuyama, 1995, and Uslaner, 2002, provide conceptual underpinnings for this relationship.

paper, Ananyev and Guriev, 2015, addresses it by focusing on a natural experiment, whereby Russia's administrative regions were differently affected by the incidence of the 2008-9 economic crisis. In particular, whereas the average GDP decline in Russia was eight percent, the per capita gross regional product declined more in Russian regions that specialized in the production of capital-intensive goods. The heterogeneous impact of the 2008-2009 economic crisis across regions differing in industrial structures enables the authors to explore the effect of regional variation in income on trust. They find that reductions in regional income lead to a deterioration of trust. Their estimated effect is sizable: a ten percent decline in income causes a 2.6 percentage points' reduction in the level of trust.[2]

In this paper, our goal is to add to the literature by analyzing the effect of income on trust in a broader context. We use a cross-country panel data set comprising 62 countries during the period 1981-2010. Our data on trust are from the World Values Survey and they include all available survey waves. These data have been used widely in the literature (see, for example, Guiso et al., 2008) to explore the relationship between trust and other variables, including economic growth. We contribute to this literature in several ways. First, we extend extant analysis by including more recent survey waves – which incidentally provide ever more comprehensive country coverage. Second, by including country fixed effects we focus on within-country variations in national income and trust, thus controlling for all the potentially omitted fixed factors. Third, we use oil price shocks as an instrumental variable for national income, which enables us to extract exogenous variation in national economic prosperity. The oil price shock instrument for national income has been used in the literature

[2] This broad conclusion is also confirmed in the extended context of transition economies in Ananyev and Guriev, 2015.

in several contexts (e.g., Brueckner et al., 2012a, b), and it has been found to be a strong IV for persistent variation in national income.

We, therefore, relate individual trust attitudes to nation-wide exogenous income, at the same time controlling for a battery of individual specific characteristics. We find that national income has a significant effect on trust attitudes. In particular, a one percent increase in national income tends to cause an average increase of one percentage point in the likelihood that a person becomes trustful. While this is generally consistent with existing studies, the contribution here is in interpreting the result in causal terms. Our approach and results are broadly consistent with Ananyev and Guriev, 2015; while that paper does not use oil price shocks to generate variation in income, the spirit of its analysis is similar.

We construct a simple model to rationalize our finding. In the model, productivity hinges upon the perceived share of trustworthy individuals. Income growth enables the individuals to infer that this share is high, whereas the opposite holds in the case of stagnation. This establishes the existence of a causal effect of national income growth on the level of trust in the economy.

To motivate our research, we present graphical evidence of the relationship between per capita GDP and average trust that is prevalent in countries. As observed in Figure 1 there is a positive and significant correlation between these two variables in our sample. This pattern is also present when distinguishing between OECD member[3] and non-member

[3] These are Australia, Canada, Chile, Estonia, Ethiopia, Finland, France, Germany, Hungary, Israel, Italy, Japan, Mexico, Netherlands, Norway, Poland, Spain, Turkey, United States.

countries, which have high and medium levels of national income, see Figure 2. We present evidence based on this classification of countries as a test of robustness of our results.

INSERT FIGURES 1 AND 2 HERE

The rest of the paper proceeds as follows. We describe the data and the sample in the next section, followed by the presentation of our empirical strategy in Section 3. The main empirical results are exhibited in Section 4; Section 5 contains a theoretical model to rationalize the empirical findings; and Section 6 concludes with brief remarks.

2. Data and sample

We examine the effect of national income on trust by testing the relationship between country's per capita GDP (PPP) and a measure of trust among individuals. We employ information from three independent data sets to this end.

Our main source of information is the World Value Surveys (WVS), a cross-country longitudinal dataset collected by the Inter University Consortium for Political and Social Research (ICPSR) in over 117 countries. Data covers the interval from 1981 to 2014 through six waves of data assembled over the following periods: the first wave covers 1981-1984; the second wave spans over 1990-1994; the third wave is held during 1995-1998; the fourth wave covers 1999-2004; the fifth wave covers 2005-2008; and the sixth wave starts in 2010 to end in 2014. The data include adult citizens of 15 years old or older who were interviewed to express their views anonymously about what they value in life, and what they perceive is

valued by others. In particular, the survey contains information about perceptions across the following subjects: environment, work, family, politics and society, religion and morale, national identity and security. Specifically, the dependent variable in our analysis is interpersonal generalized trust of individuals towards their peers, which is measured by individuals' responses to the question: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*" The answers are recoded into a dichotomous variable that takes the value of 1 which stands for "*Most people can be trusted*"[4] and 0 which stands for "*Need to be very careful*". The dataset also allows us to draw on a set of control variables reported at an individual level.

The main explanatory variable is GDP per capita. For the period 1981-2010, GDP per capita data are drawn from the International Comparison Program's database gathered by the World Bank. Specifically, we use the variable annual real per capita GDP measured in constant international dollars that were converted using purchasing power parity (PPP) rates based on the 2011 International Comparison Round (ICP). To smooth year-to-year changes across the analyzed period, we take the natural logarithm of the GDP per capita variable.

Our instrument for the endogenous country-level per capita GDP is oil price shocks. The original dataset is drawn from Brueckner et al. (2012a). Oil prices are the simple average of the Dubai, Brent and Texas price reports that cover the period 1960-2001, which are drawn from the United Nations Conference on Trade and Development Commodity Statistics (UNCTAD, 2009). The oil price shock variable is constructed by multiplying the change in the natural logarithm of the international oil price with countries' average share of net oil

[4] The original options in the WVS are scaled 1 and 2, where 1 stands for "*Most people can be trusted*" and 2 stands for "*Need to be very careful*".

exports in GDP. Thus we take into consideration that variations in international oil prices affect countries national incomes depending on their commercial position as net importers or exporters. Formally, the oil price shock instrument is constructed as follows:

$$OilPriceShock_{c,t} = \Delta \text{In}(OilPrice)_t * \theta_c \quad (1)$$

where, $\Delta \text{In}(OilPrice)_t$ is the difference in the natural log of the international oil price in period t in comparison to the previous year; and weights it by the average share of net oil exports over GDP. This is denoted by the time-invariant factor θ_c that corresponds to country c[5]. For the estimation sample, summary statistics of the oil price shock variable for period t are reported in Table 1.

INSERT TABLE 1 HERE

For the purpose of this study, we consolidate the information from the three sources described above. The resulting core sample comprises 164,457 individual-level observations for 62 countries; this sample is dictated by the available data on trust, income, and the oil price shock instrument. The list of home countries of the analyzed individuals is presented in Appendix A. Also, the full set of variables tested to control individual and country's characteristics are reported with summary statistics in Table 1. We present specifications including main basic controls such as gender, age, marital status, number of children, and highest education level achieved. The definition of these variables is explained in detail in Appendix B. Finally, the summary statistics of the proposed instrument in the estimation sample is also reported in Table 1.

[5] The values of θ_c range from -0.03 to 0.18, with a mean of 0.009 (see details in Brueckner et al. 2012a).

3. Empirical framework

Baseline specification

Our goal is to estimate the effect of national income on interpersonal trust. The literature, see the survey section in the introduction, has addressed this topic empirically both at the country and at the individual level; and it has shown that higher-income individuals have indeed higher levels of trust. Nevertheless, empirical papers thus far have mainly drawn conclusions based on correlations between the studied variables, leaving open the question whether trust increments nationwide are caused by higher income levels.

We attempt to quantify the causal effect of national income on trust among individuals based on cross country analysis, using log per capita GDP that accounts for the average individual's income; and a broad trust measure in the sense that it doesn't capture confidence with respect to a specific group (e.g. by ethnicity, organizations, institutions). For this purpose, we employ an estimation strategy set at the individual level. Our baseline econometric model is given by:

$$Trust_{ijt} = \alpha + \gamma ln\big(per\ capita\ GDP\ PPP_{jt}\big) + X'_{ijt}\delta + \varphi_t + \tau_j + \varepsilon_{ijt} \quad (2)$$

where $Trust_{ij}$ is the reported trust level of individual i in country j in period t that corresponds to the year when the survey was conducted. $Per\ capita\ GDP\ PPP_j$ corresponds to average income at purchasing power parity of country j for the corresponding period in which the individual reports her or his level of trust. Thus γ is our parameter of interest, which measures the response of trust to a change in national income.

We include in the econometric model time and country fixed effects, and individual level controls to increase the efficiency of our parameter estimates. We compute standard errors that are Huber robust and clustered at the country level.

Identification

We consider that least squares estimation of equation (2) does not provide consistent estimates of γ since, in particular, trust affects income per capita. To address causality issues we use plausibly exogenous oil price shocks as an instrument of log per capita GDP, within a conditional joint maximum likelihood estimation method allowing for national income to be endogenous.

Our identification assumption is that the oil price shock instrument only has a systematic effect on trust through variations in national income. Moreover, we propose that lagged values of oil price shocks are likely to affect per capita GDP as do contemporary shocks due to its persistent effect. In particular, the second-stage equation is given by:

$$Trust_{ijt} = \beta E\left[ln(per\ capita\ GDP_{jt})\middle|\bar{Z}_{jt}\right] + \bar{X}'_{ijt}\delta + \varphi_t + \tau_j + \varepsilon_{ijt} \quad (3)$$

where $Trust_{ijt}$ is the trust indicator of individual i that lives in country j in period t. We control for a set of individual characteristics expressed in vector $\bar{X}_{ijt}$ and country-specific fixed effects (τ_j) to account for within-country factors that affect both trust and income levels. We also allow survey year fixed effects (φ_t) in our specification. The term $E\left[ln(per\ capita\ GDP)_{ijt}\middle|\bar{Z}_{ijt}\right]$ stands for the predicted level of log per capita GDP obtained from $\bar{Z}_{ijt}$, which is a vector of variables including Z_{jt} , Z_{jt-1} and Z_{jt-2}. In particular, the predicted level of log per capita GDP is obtained from the following equation:

$$ln(per\ capita\ GDP_{ijt}) = \pi_0 Z_{jt} + \pi_1 Z_{jt-1} + \pi_2 Z_{jt-2} + X'_{ijt}\theta + \omega_j + \tau_t + \theta_{jt} + \mu_{ijt} \quad (4)$$

Equation (4) corresponds to our first stage equation. The set of variables Z_{jt} , Z_{jt-1} and Z_{jt-2} correspond to the instruments, i.e. one contemporaneous (for period t) and two lagged values of oil price shocks (for periods t-1 and *t*-2). Various specifications of lagged values were tested to capture the persistent income effects triggered by variations in the oil price instrument. Specifically, the IV employed are the following: (1) contemporaneous oil price shock; (2) oil price shock of period *t-1*; (3) oil price shock of period *t-2*; (4) oil price shock of period *t* and *t-1*; and (5) oil price shocks of periods *t*, *t-1* and *t-2*. As documented in Brueckner et al. (2012a, 2012b), there is a strong correlation between the vector $\bar{Z}_{ijt}$ and $ln(per\ capita\ GDP_{ijt})$, implying $\pi_0 \neq 0, \pi_1 \neq 0, \pi_2 \neq 0$.

4. Results

In Table 2 we present baseline estimates of the effects of country's per capita GDP on trust in people. The estimates are based on the model described in the previous section. We report three specifications in which country and survey years' fixed effects are included. Column (1) examines the unconditional effect of real per capita income on a general measure of trust in people. Column (2) shows this effect when controlling in the econometric model for a set of potentially relevant individual characteristics; and column (3) adds the highest educational level attained as a trust determinant.

Columns (1)-(3) of Table 2 show a statistically significant and positive income effect on trust. Quantitatively, we observe that this relationship is stronger when controlling for differences in individuals' education.

INSERT TABLE 2 HERE

In order to obtain an estimate of the causal effect of national income on individuals' trust we use an IV approach. Maximum likelihood estimates of how (instrumented) national real per capita GDP affect the levels of average trust attitudes towards people are reported in Table 3. We begin by exploring this effect using oil price shocks of period *t* as instrument for real per capita income reported during period *t*. Both country and survey year's fixed effects are included in the regression. Columns (1) to (3) of Table 3 show that a positive effect of national income on trust holds across the three specifications thus far described.

Instrumental variables estimation yields a positive effect of national income on trust. We can reject the null that the coefficient on national income is equal to zero at the 1 percent significance level for all three specifications. Quantitatively, the coefficient on national income is largest in column (3) where we control for individuals' characteristics, in particular, education. The coefficient (standard error) on national income in column (3) is around 1.46 (0.29). This coefficient should be interpreted as a one percent increase in GDP per capita increasing the likelihood of trust by around 1.46 percentage points. Roughly, the IV estimate in table 3 can thus be read as a one percent increase in national income increasing the likelihood of trust by 1 percentage point.

INSERT TABLE 3 HERE

It is noteworthy that the instrumental variables regressions in Table 3 yield coefficients on national income that are larger than those reported in Table 2 (where national income is not instrumented). For each specification, we can reject the null hypothesis that the coefficient in Table 3 is equal to the coefficient in Table 2 at the 1 percent significance level. Hence, not instrumenting GDP per capita leads to an understatement of the causal effect that national income has on trust.

Tables 4 and 5 document that the second-stage coefficients on national income are of similar magnitude and statistical significance when we use lagged oil price shocks of periods t-1 and t-2 as instruments for per capita GDP of period t.

INSERT TABLES 4 TO 5 HERE

Since the effect of oil shocks on GDP per capita may remain for periods longer than a year, a longer period set of lagged oil price shocks are also considered as instruments. Oil price shocks for period t and t-1 are used as instruments in Table 6. Here, we find a positive and significant link between per capita GDP and trust.

Using a more comprehensive set of instruments supports our main finding that income has a significant positive effect on trust. Table 7 includes contemporaneous (period t) and lagged oil price shocks in period t-1 and t-2 as instruments. As can be seen from Table 7, the coefficients on national income continue to be positive and significantly different from zero at the 1 percent significance level. Quantitatively, the second-stage coefficient on national income is around unity. We note that the quality of our instrumental variables is reasonable as the p-value of the F-statistic is below 1%; further the F-statistic is well above 10.

INSERT TABLES 6 TO 7 HERE

In addition to the results presented above, we also test for heterogeneous effects by introducing an interaction term between GDP and membership in the OECD. The purpose of this is to examine whether the impact of GDP is different in richer countries in relation to poorer ones. In Appendix C we observe that whereas the GDP coefficient remains statistically significant for all specifications, the coefficient on the interaction term is negative and statistically significant for the first two specifications only, and is insignificant when adding controls, as shown in the third column. Furthermore, when using our instrumental variables approach we find statistically insignificant results for all our specifications[6]. These additional results show limited evidence that the impact of national income on trust differs systematically for OECD countries

We summarize our findings graphically in Figures 3 and 4. In these figures variations in GDP are induced by the oil price shock instrument. In the first figure we see a significant positive average relationship between per capita GDP and trust. The slope of the fitted line in Figure 3 is steeper than in Figure 1. Thus, the magnitude of the effect of national income on trust is stronger when instrumenting GDP by plausibly exogenous oil price shocks. Figure 4 shows the estimated slopes for OECD and non-OECD countries. We observe that the slope is somewhat higher for OECD than non-OECD countries although quantitatively this difference is minuscule and the 95 percent confidence bands overlap.

INSERT FIGURES 3 AND 4 HERE

[6] The instrumental variables results are not reported here.

5. A model

We now present a stylized model in order to illustrate a possible mechanism through which the detected effect of national income on trust can materialize.

The framework

Consider an economy populated by identical households, indexed i, each consisting of a parent and a child, with a unit measure, that operates over discrete time periods t. We let y_t denote each household's period t's income; c_t – its consumption; and k_{t+1} its capital investment. The initial income level, y_0, is given. A household's budget constraint is:

(5) $y_t = c_t + k_{t+1}$

Income production function is given as follows:

(6) $y_t = A_t k_t$

where $A_t > 0$ is TFP, which is assumed to depend on the level of trust in the economy. Specifically, we assume that $A_t = 1+s_t$, where s_t is the share of trustworthy individuals. There is uncertainty in regard to this share, which is assumed to be distributed, in each period, binomially, i.e., $s_t=1$ with the probability π_t and $s_t=0$ with the probability $1-\pi_t$; π_t is interpreted as the level of trust in the economy. We let $E\pi_t$ denote the expected value of the probability of $s_t=1$, π_t. Initially, π_0 is distributed according to a known distribution in the interval [0,1], and the distribution of individuals' subsequent trust beliefs evolves over time.

Parents derive utilities from family consumption and their offspring's income, $U(c_t, y_{t+1})$; to simplify matters we impose the following functional form:

(7) $U(c_t, y_{t+1}) = \ln(c_t) + y_{t+1}$

In each period, parents allocate family income, subject to the budget constraints, so

as to maximize the expected utility with respect to the share of honest individuals. And they, further, update their trust priors, upon observing income realizations. In equilibrium, all these decisions are mutually consistent.

Analysis

In any period t, the first order condition with respect to the investment amount is:

(8) $-1/(y_t - k_{t+1}) + 1+E\pi_{t+1} = 0,$

so that

(9) $k_{t+1} = y_t - 1/(1+ E\pi_{t+1})$

The substitution of which into the production function yields:

(10) $y_{t+1} = (1+s_{t+1})(y_t - 1/(1+ E\pi_{t+1}))$

It then follows, since s_{t+1} is a Bernoulli variable, that the prior distribution of y_{t+1} is also Bernoulli. And both variables' posterior follows from Bayesian updating. As the beta distribution is a conjugate prior for Bernoulli, it is convenient to assume that π_0 is distributed according to the beta distribution, with parameters (α_0, β_0), implying its expected value of $\alpha_0/(\alpha_0+\beta_0)$. Its expected value in subsequent periods can then be found recursively as follows:

(11) $E\pi_{t+1} = (\alpha_t + s_{t+1})/(\alpha_t+\beta_t+1)$, so that $E\pi_{t+1} > E\pi_t$ if $s_{t+1}=1$, and $E\pi_{t+1} < E\pi_t$ if $s_{t+1}=0$.

Whereas higher expected value of π_{t+1} – hence, of TFP – positively affects investment, it is also true that, because of the Bayesian updating, a higher value of observed income implies an upward revision of the probability of being honest, hence, trust.

We, therefore, have the following implication of the model:

Proposition 1. A higher realization of national income leads to a higher level of trust in the

economy.

A higher level of national income induces individuals to infer that the share of trustworthy individuals – hence, productivity – is high. Such Bayesian revision directly implies the indicated causal relationship. The model is, therefore, consistent both with the established result that trust affects growth prospects and with the presented finding that high national income induces trust. Its dynamic extension – not pursued here - could indicate the possibility of a mutual feedback between income and trust. It would lead to trust persistence, which was found to be the case in some recent work, see Becker et al., 2014.

6. Concluding remarks

As generalized trust has been recognized an important factor for economic development, its determinants deserve studying. Already Banfield, 1958, in his seminal study of distrust in southern Italy advanced the hypothesis that poverty and backwardness can be one of the determinants of distrust among people. Yet, more detailed evidence on this channel has been sparse. In this paper, we use all available waves of the World Values Surveys to address the issue. Employing an instrumental variable approach to overcome endogeneity biases and focusing on within country variations, we find that national income has a positive effect on the level of trust. In particular, an increase of one percent in the former variable leads to a one percentage point increase in the likelihood of trust. This result is generally consistent with the cross country study of Bjornskov, 2006, and with the study of Russia by Ananyev

and Guriev, 2015. The detected effect appears uniform across countries at different levels of economic development and across demographic segments of the population, i.e., we have not been able to detect important interactive effects with national income across these other variables. Further, we have exhibited a model that rationalizes our main finding. In the model, high national income constitutes a signal of trustworthiness in the economy – which then leads to individuals becoming more trustful.

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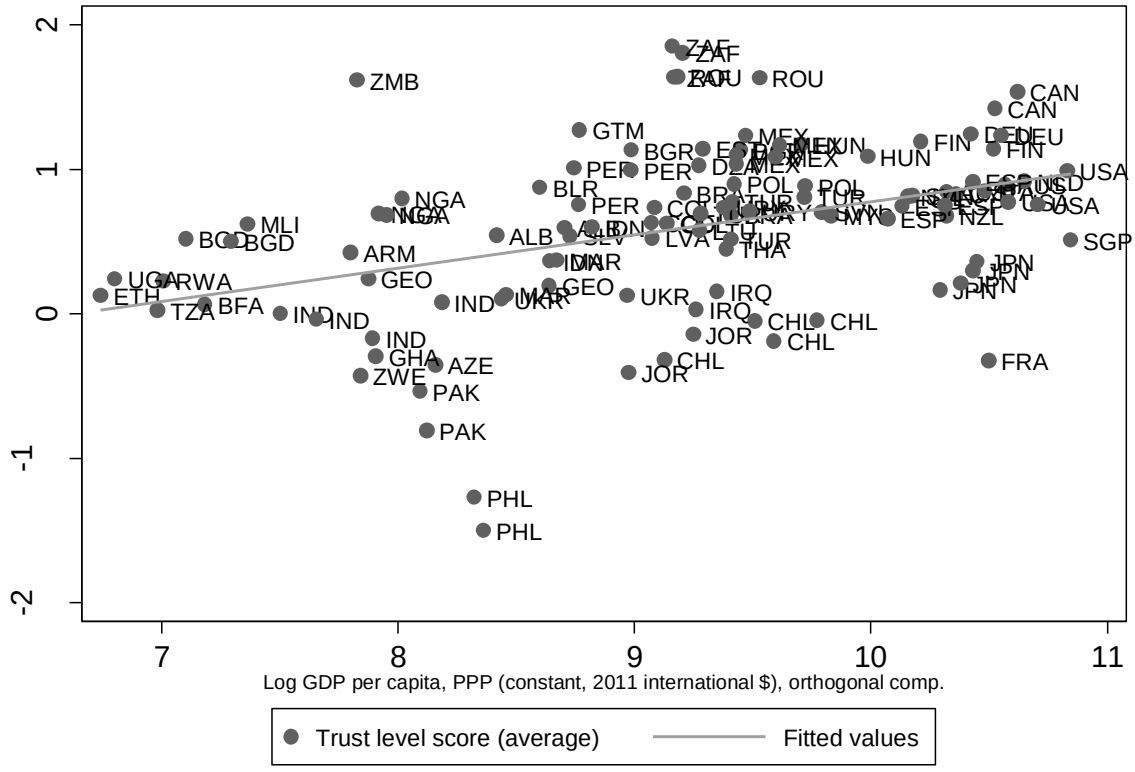
Figure 1.

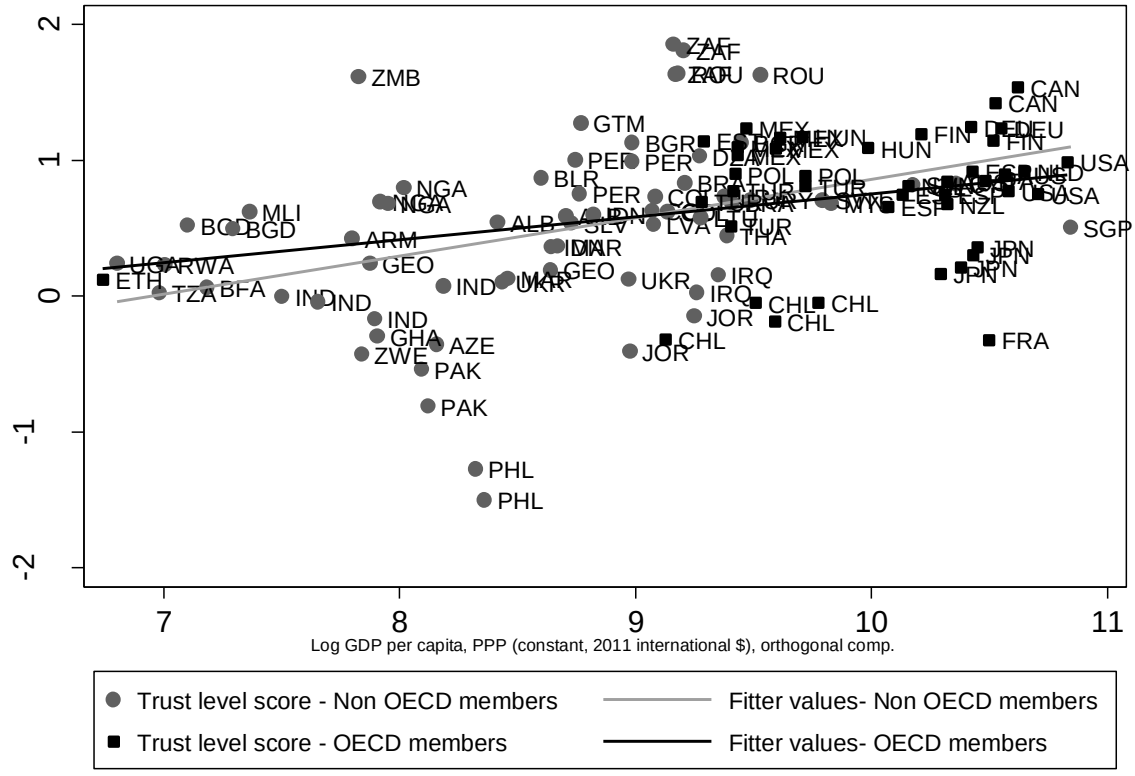
Trust and log GDP per capita



Note: Correlation controlled for individual characteristics.

Figure 2.

Trust and log GDP per capita by country's OECD association

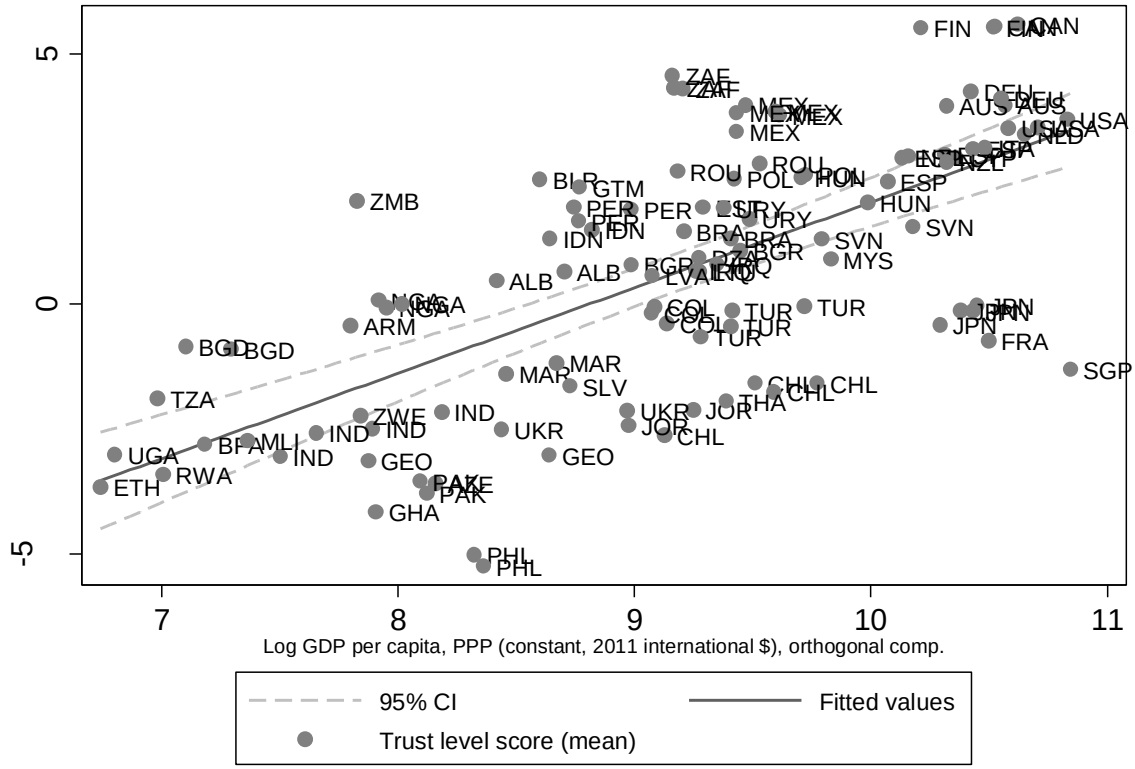


coef=.19300663, (robust) se=0.070, z=5.02, Method: probit

Note: Correlation controlled for individual characteristics.

Figure 3.

Trust and log GDP per capita, IV results

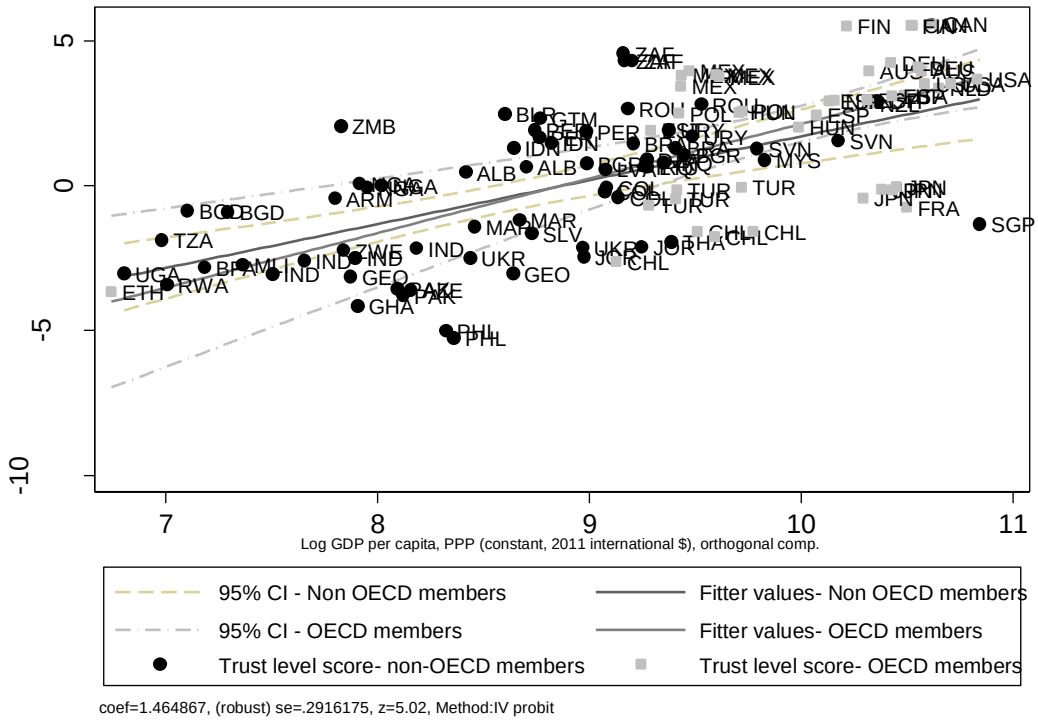


coef=1.464867, (robust) se=.2916175, z=5.02, Method:IV probit

Note: GDP is instrumented with contemporaneous oil price shock. Confidence intervals outline +/- 2 standard errors.

Figure 4.

Trust and log GDP per capita by country's OECD association



Note: GDP is instrumented with contemporaneous oil price shock. Confidence intervals outline +/- 2 standard errors.

Table 1. Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Country characteristics					
Oilshock[1], t	164,457	0.001	0.005	-0.005	0.043
GDP per capita PPP (constant 2011 international $)	164,457	15,498	16,162	847	127,236
Log GDP per capita, PPP (constant 2011 international $)	164,457	0.750	0.433	0.000	1.000
Individual's characteristics					
Agreement with opinion that says that most people can be trusted[2]	164,457	0.750	0.433	0.000	1.000
Male	164,457	0.487	0.500	0.000	1.000
Age	164,044	40	16	15	99
Marital status: married	164,457	0.625	0.484	0.000	1.000
Number of children	154,043	2.016	1.927	0.000	8.000
Highest educational level attained: primary or secondary	148,131	0.772	0.420	0.000	1.000

Notes: (1) The variable measures the change in log of international oil price, times countries' GDP shares of oil net exports for period t. (2) The variable of trust is captured by the question "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*" The answers were coded 1 which stands for "*Most people can be trusted*" and 2 which equals "*Need to be very careful*". The latter answer was recoded with 0 value instead of 2.

Table 2. Effects of country's per capita GDP on trust in people, probit results

Dependent variable	Trust in people		
	(1)	(2)	(3)
Log GDP per capita, PPP (constant 2011 international $)	0.097*	0.099*	0.193***
	(0.057)	(0.057)	(0.070)
Male		-0.114	0.227***
		(0.088)	(0.010)
Age in years		-0.000	-0.000
		(0.000)	(0.000)
Number of children			-0.004*
			(0.003)
Marital status			
Married		-0.0312***	-0.0291***
		(0.008)	(0.009)
Highest educational level attained			
Primary or secondary complete/incomplete			0.227***
			(0.009)
Fixed effects			
Country	Yes	Yes	Yes
Survey year	Yes	Yes	Yes
Observations	164,457	164,044	138,037
LR chi2	13,531	13,543	12,573
Prob > chi2	0.000	0.000	0.000
Log likelihood	-85,162	-84,935	-70,975

Notes: The method of estimation is maximum likelihood estimation. The observations are at the individual-level unit. The dependent variable is measured with the question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" where the value 0 stands for "Need to be very careful" and 1 stands for "Most people can be trusted". Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%.

Table 3. Effects of country's per capita GDP on trust in people, IV results
(IV: Contemporaneous oil price shock, t)

	Trust in people		
	(1)	(2)	(3)
Log GDP per capita, PPP (constant 2011 international $)	0.973***	1.005***	1.465***
	(0.234)	(0.234)	(0.292)
Male		-0.023***	-0.0177**
		(0.007)	(0.00770)
Age in years		-0.000*	-0.000319
		(0.000)	(0.000296)
Marital status			
Married		-0.0309***	-0.0284***
		(0.008)	(0.00895)
Number of children			-0.00493*
			(0.00267)
Highest educational level attained			
Primary or secondary complete/incomplete			0.232***
			(0.00914)
Fixed effects			
Country	Yes	Yes	Yes
Survey year	Yes	Yes	Yes
Observations	164,457	164,044	138,037
Log pseudolikelihood	153,288	152,802	146,285
Wald chi-squared	13,617	13,635	12,697
Model Wald p-value	0.000	0.000	0.000
Wald chi-squared test of exogeneity	14.83	15.85	20.09
Wald test exogeneity p value	0.000	0.000	0.000

Notes: The method of estimation is maximum likelihood estimation. The observations are at the individual-level unit. The dependent variable is measured with the question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" where the value 0 stands for "Need to be very careful" and 1 stands for "Most people can be trusted". Standard errors in parentheses. Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%.

Table 4. Effects of country's per capita GDP on trust in people, IV results
(IV: Lagged values of oil price shock t-1)

	Trust in people		
	(1)	(2)	(3)
Log GDP per capita, PPP (constant 2011 international $)	1.239***	1.325***	1.846***
	(0.421)	(0.421)	(0.445)
Male		-0.0242***	-0.019**
		(0.00704)	(0.008)
Age in years		-0.000441*	-0.000
		(0.000239)	(0.000)
Marital status			
Married		-0.0311***	-0.029***
		(0.00771)	(0.009)
Number of children			-0.005*
			(0.003)
Highest educational level attained			
Primary or secondary complete/incomplete			0.233***
			(0.009)
Fixed effects			
Country	Yes	Yes	Yes
Survey year	Yes	Yes	Yes
Observations	162,459	162,046	136,047
Log pseudolikelihood	146,877	146,397	140,718
Wald chi-squared	13,657	13,689	12,752
Model Wald p-value	0.000	0.000	0.000
Wald chi-squared test of exogeneity	7.460	8.591	13.99
Wald test exogeneity p-value	0.006	0.003	0.000

Notes: The method of estimation is maximum likelihood estimation. The observations are at the individual-level unit. The dependent variable is measured with the question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" where the value 0 stands for "Need to be very careful" and 1 stands for "Most people can be trusted". Standard errors in parentheses. Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%.

Table 5. Effects of country's per capita GDP on trust in people, IV results

(IV: Lagged values of oil price shock t-2)

	Trust in people		
	(1)	(2)	(3)
Log GDP per capita, PPP (constant 2011 international $)	1.382***	1.420***	2.310***
	(0.501)	(0.502)	(0.763)
Male		-0.026***	-0.022***
		(0.007)	(0.008)
Age in years		-0.000	-7.94e-05
		(0.000)	(0.000)
Marital status			
Married		-0.035***	-0.033***
		(0.008)	(0.009)
Number of children			-0.005**
			(0.003)
Highest educational level attained			
Primary or secondary complete/incomplete			0.236***
			(0.009)
Fixed effects			
Country	Yes	Yes	Yes
Survey year	Yes	Yes	Yes
Observations	156,790	156,377	130,406
Wald chi-squared	13,578	13,599	12,683
Model Wald p-value	0.000	0.000	0.000
Wald chi-squared test of exogeneity	7.456	7.802	8.612
Wald test exogeneity p-value	0.006	0.005	0.003

Notes: The method of estimation is maximum likelihood estimation. The observations are at the individual-level unit. The dependent variable is measured with the question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" where the value 0 stands for "Need to be very careful" and 1 stands for "Most people can be trusted". Standard errors in parentheses. Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%.

Table 6. Effects of country's per capita GDP on trust in people, IV results

(IV: Contemporaneous values and lagged values of oil price shock; t and t-1)

	Trust in people		
	(1)	(2)	(3)
Log GDP per capita, PPP (constant 2011 international $)	0.875***	0.891***	1.360***
	(0.217)	(0.217)	(0.282)
Male		-0.024***	-0.0189**
		(0.007)	(0.008)
Age in years		-0.000*	-0.000
		(0.000)	(0.000)
Marital status			
Married		-0.031***	-0.0294***
		(0.008)	(0.009)
Number of children			-0.005*
			(0.003)
Highest educational level attained			
Primary or secondary complete/incomplete			0.232***
			(0.009)
Fixed effects			
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	162,459	162,046	136,047
Log pseudolikelihood	151,166	150,689	143,476
Wald chi-squared	13597	13,612	12,666
Model Wald p-value	0.000	0.000	0.000
Wald chi-squared test of exogeneity	13.77	14.29	18.21
Wald test exogeneity p-value	0.000	0.000	0.000

Notes: The method of estimation is maximum likelihood estimation. The observations are at the individual-level unit. The dependent variable is measured with the question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" where the value 0 stands for "Need to be very careful" and 1 stands for "Most people can be trusted". Standard errors in parentheses. Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%.

Table 7. Effects of country's per capita GDP on trust in people, IV results

(IV: Contemporaneous values and lagged values of oil price shock; t, t-1 and t-2)

	Trust in people		
	(1)	(2)	(3)
Log GDP per capita, PPP (constant 2011 international $)	0.730***	0.740***	1.384***
	(0.197)	(0.197)	(0.292)
Male		-0.023***	-0.021***
		(0.007)	(0.008)
Age in years		-0.000	-0.000
		(0.000)	(0.000)
Marital status			
Married		-0.035***	-0.034***
		(0.008)	(0.0095)
Number of children			-0.005*
			(0.003)
Highest educational level attained			
Primary or secondary complete/incomplete			0.235***
			(0.009)
Fixed effects			
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	156,790	156,377	130,406
Log pseudolikelihood	160,624	160,118	160,360
Wald chi-squared	13,496	13,511	12,559
Model Wald p-value	0.000	0.000	0.000
Wald chi-squared test of exogeneity	14.32	14.58	21.86
Wald test exogeneity p-value	0.000	0.000	0.000

Notes: The method of estimation is maximum likelihood estimation. The observations are at the individual-level unit. The dependent variable is measured with the question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" where the value 0 stands for "Need to be very careful" and 1 stands for "Most people can be trusted". Standard errors in parentheses. Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%.

Appendix A. List of countries included in baseline sample

1	ALB	Albania	41	NGA	Nigeria
2	DZA	Algeria	42	NOR	Norway
3	ARM	Armenia	43	PAK	Pakistan
4	AUS	Australia	44	PER	Peru
5	AZE	Azerbaijan	45	PHL	Philippines
6	BGD	Bangladesh	46	POL	Poland
7	BLR	Belarus	47	QAT	Qatar
8	BRA	Brazil	48	ROU	Romania
9	BGR	Bulgaria	49	RWA	Rwanda
10	BFA	Burkina Faso	50	SGP	Singapore
11	CAN	Canada	51	SVN	Slovenia
12	CHL	Chile	52	ZAF	South Africa
13	COL	Colombia	53	ESP	Spain
14	HRV	Croatia	54	TZA	Tanzania
15	CYP	Cyprus	55	THA	Thailand
16	SLV	El Salvador	56	TUR	Turkey
17	EST	Estonia	57	UGA	Uganda
18	ETH	Ethiopia	58	UKR	Ukraine
19	FIN	Finland	59	USA	United States
20	FRA	France	60	URY	Uruguay
21	GEO	Georgia	61	ZMB	Zambia
22	DEU	Germany	62	ZWE	Zimbabwe
23	GHA	Ghana			
24	GTM	Guatemala			
25	HUN	Hungary			
26	IND	India			
27	IDN	Indonesia			
28	IRQ	Iraq			
29	ISR	Israel			
30	ITA	Italy			
31	JPN	Japan			
32	JOR	Jordan			
33	LVA	Latvia			
34	LTU	Lithuania			
35	MYS	Malaysia			
36	MLI	Mali			
37	MEX	Mexico			
38	MAR	Morocco			
39	NLD	Netherlands			
40	NZL	New Zealand			

Source: World Value Survey (WVS), longitudinal dataset, 1981-2014.

Appendix B. Description of variables

Variable name	Description
Dependent variable	
Log GDP per capita, PPP (constant 2011 international $)	Annual real per capita GDP measured in constant international dollars from 2011. Current dollars were converted using purchasing power parity (PPP) rates based on the 2011 International Comparison Round (ICP). Then, the log values were taken.
Variable of interest	
Agreement with opinion that says that most people can be trusted	The information is taken by the question: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*" The original answers were coded 1 which stands for "*Most people can be trusted*" and 2 which equals "*Need to be very careful*". These values were recoded into a dichotomous variable that takes the value of 1 and 0, respectively.
Instrument	
Oilshock, t	Natural logarithm of the simple average of oil prices from the Dubai, Brent and Texas report (UNCTAD), multiplied by the share of net oil exports in GDP.
Control variables	
Male	Dichotomous variable; has the value of 1 to indicate "Men" and 0 otherwise.
Age	Continuous variable that reports individual ages in years.
Marital status: married	Dichotomous variable; has a value of 1 to indicate "Married" and 0 otherwise.
Number of children	Continuous variable.
Highest educational level attained	Dichotomous variable; has the value of 1 to indicate "Primary or Secondary complete/incomplete" and 0 otherwise.
Survey year	Year in which the individual reported. Transformed into dichotomous variable to indicate each year value and control for fixed effects.
Country of residence	Country in which the individual lives when he or she answered the WVS. Transformed into dichotomous variable to indicate each country control for fixed effects.

Appendix C. Trust and GDP: Interaction terms with OECD country members

	Trust in people		
	(1)	(2)	(3)
OECD country member (=1)	0.873	0.954	-1.784
	(0.715)	(0.716)	(1.114)
Log GDP per capita, PPP (constant 2011 international $)	0.106*	0.109*	0.215***
	(0.0575)	(0.0575)	(0.0722)
OECD country member (=1)*Log GDP per capita	-0.130*	-0.138**	0.117
	(0.0666)	(0.0666)	(0.100)
Constant	-0.326	-0.296	-1.416**
	(0.496)	(0.496)	(0.632)
Fixed effects			
Country	Yes	Yes	Yes
Survey year	Yes	Yes	Yes
Observations	164,457	164,044	138,037
LR chi2	12579	12579	12579
Prob > chi2	0.000	0.000	0.000
Log likelihood	-70974	-70974	-70974

Note: The method of estimation is probit. The observations are at an individual-level unit. Standard errors in parentheses. Covariates follow the same specification as in previous tables. In column (1) there are no additional control variables. In column (2) control variables are: male, age in years and marital status. Column (3) has the same covariates as column (2) and adds the number of children and the highest educational level attained. Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%.

Appendix D. Weak instrument robust tests and confidence sets for IV probit

Test	Panel A. Instrumental variable Oilshock, t		
	(1)	(2)	(3)
AR	17.28***	18.41***	25.54***
	[.512, 1.430]	[.551, 1.463]	[.904, 2.033]
Wald	17.25***	18.38***	25.48***
	[.515, 1.434]	[.547, 1.467]	[.898, 2.038]
	Panel B. Instrumental variable Oilshock, t-1		
	(1)	(2)	(3)
AR	8.57***	9.79***	17.16***
	[.418, 2.066]	[.504, 2.154]	[.983, 2.722]
Wald	8.55***	9.77***	17.09***
	[.410, 2.075]	[.496, 2.162]	[.974, 2.73]
	Panel C. Instrumental variable Oilshock, t-2		
	(1)	(2)	(3)
AR	7.47***	7.85***	8.97***
	[.401, 2.372]	[.437, 2.412]	[.814, 3.830]
Wald	7.45***	7.83***	8.92***
	[.391, 2.382]	[.426, 2.422]	[.798, 3.845]
	Panel D. Instrumental variable Oilshock, t and t-1		
	(1)	(2)	(3)
CLR	16.19***	16.80***	23.47***
	[.453, 1.298]	[.469, 1.314]	[.816, 1.908]
K	16.19***	16.80***	23.47***
	[.453, 1.298]	[.469, 1.314]	[.816, 1.908]
AR	17.41***	18.48***	25.72***
	[.401, 1.320]	[.452, 1.331]	[.838, 1.886]
Wald	16.17***	16.78***	23.42***
	[.449, 1.302]	[.465, 1.3182]	[.811, 1.914]
	Panel E. Instrumental variable Oilshock, t, t-1 and t-2		
	(1)	(2)	(3)
CLR	13.59***	13.96***	22.37***
	[.345, 1.114]	[.355, 1.124]	[.817, 1.955]
K	13.58***	13.95***	22.36***
	[.345, 1.114]	[.355, 1.124]	[.817, 1.955]
AR	16.89***	17.89***	25.05***
	[.3140, 1.145]	[.355, 1.124]	[.724, 2.048]

Wald	13.57***	13.94***	22.32***
	[.3415, 1.118]	[.351, 1.128]	[.811, 1.961]

Notes: Tests are computed within a non-linear two-step estimation framework allowing for an endogenous repressor. Statistics confidence level follows the system: 10% = *; 5%=**; 1%=***. Confidence sets are presented in brackets. These are computed with confidence levels of 95%, for 100 points across a range with the method of minimum distance (MD). Homoscedastic standard errors are assumed for computation.