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INTERNATIONAL CENTER FOR PUBLIC POLICY

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National Income and Trust

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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. We also identify crime and corruption as potential mechanisms that may lead to the reported causal effect and explore heterogeneous effects across individuals.

Keywords: Trust; National Income; Oil Price Shocks, Crime, Corruption, City Size

JEL classification: O10, P17

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> "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time." (Arrow, 1972)

Introduction

In his seminal work, Banfield (1958) summarized impressions and interviews he conducted in a deprived village community in south Italy. Banfield's argument was that the crucial component behind the village's impoverishment was cultural, specifically the villagers' cherished norm of what he called "amoral familism," as opposed to the value of acting for the sake of the common good of the community. This family-centric orientation, according to Banfield, was related to mistrust and suspicion among the villagers, leading to their inability to act in tandem and, thus, contributing to the (lack of) economic development of their community at large. This work inspired subsequent literature on social capital and generalized trust. In particular, the level of trust in an economy has been shown to be correlated with economic performance, specifically, with economic growth.[1] 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 and contract enforcement, i.e., trust is instrumental in avoiding prisoner dilemma outcomes.

More recently, effects of trust on various aggregate outcomes have been explored in, for example, Aghion et al. (2010), Bjornskov (2009, 2010), Bjornskov and Meon (2013), and Bjornskov and Svendsen (2013). The documented importance of trust implies that there is

[1]Fukuyama (1995) and Uslaner (2002) provide conceptual underpinnings for this relationship. Additional important work includes 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) and Bjornskov (2012). 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 U.S. states as well.

potential interest in studying its nationwide determinants and their mechanisms. 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 (c.f., "If the average income were increased by a large amount, people would sooner or later act on a broader conception of self-interest." p. 169). 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 paper Ananyev and Guriev (2018) addresses it by focusing on a natural experiment, whereby Russia's administrative regions were differently affected by the incidence of the 2008–09 economic crisis. In particular, whereas the average GDP decline in Russia was 8 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 2008–09 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 10-percent decline in income causes a 2.6-percentage point reduction in the level of trust.[2]

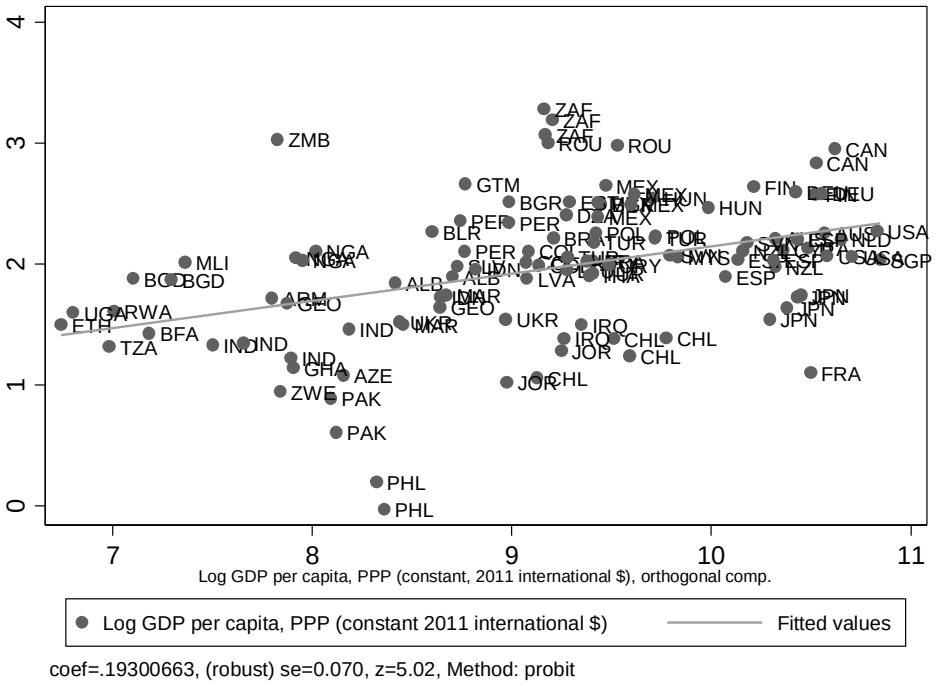
In this paper, our goal is to add to the literature by analyzing the effect of income on trust in a broader context and to explore mechanisms through which income may affect trust.

[2] This broad conclusion is also confirmed in the extended context of transition economies in Ananyev and Guriev (2018).

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.

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 countries, which have high and medium levels of national income, see Figure 2.

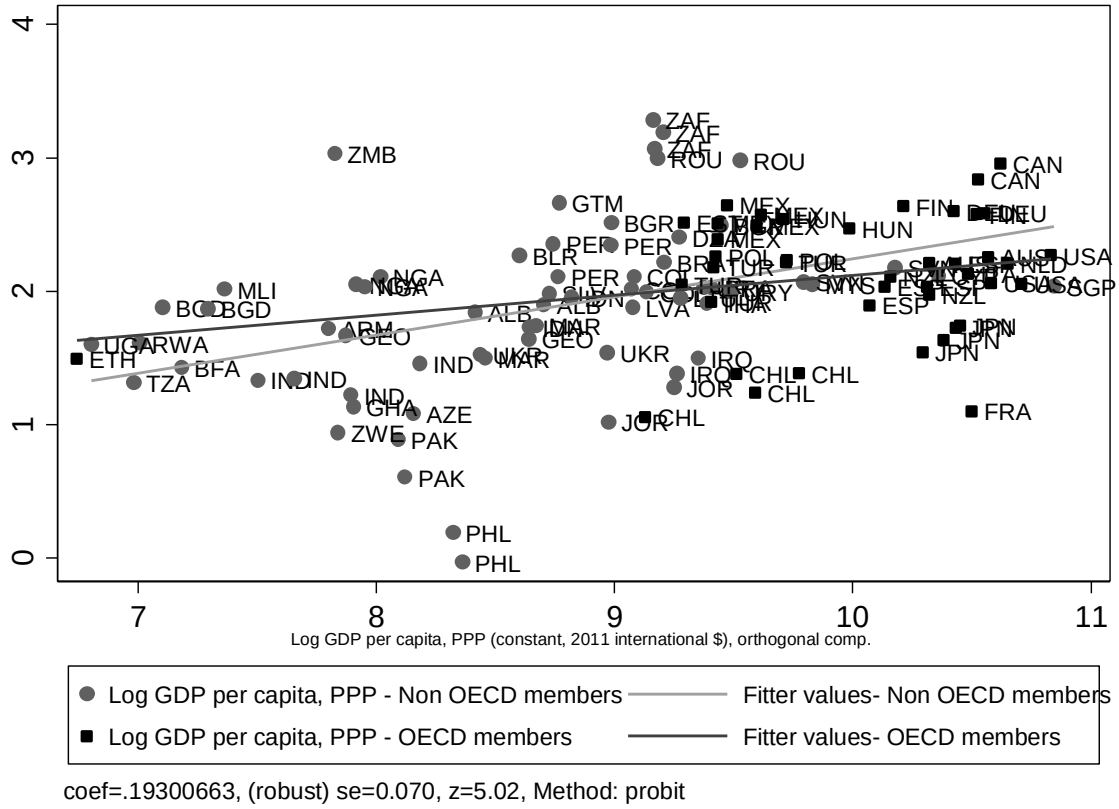
Figure 1. Trust and log GDP Per Capita



Note: Correlation controlled for individual characteristics.

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

Figure 2. Trust and log GDP Per Capita by Country's OECD Association



Note: Correlation controlled for individual characteristics.

We contribute to the 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 in several contexts (e.g., Brueckner et al., 2012a, b), and it has been found to be a strong instrumental variable for persistent variation in national income. Fourth, we explore channels through which national income could affect trust.

Relating 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 1-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 (2018); while that paper does not use oil price shocks to generate variation in income, the spirit of its analysis is similar.

Beyond establishing the causal effect of national income on trust, we also explore mechanisms through which this effect materializes. Broadly, our background argument is that national prosperity is a signal of a well-functioning economy that allocates resources to productive use as opposed to rent seeking.[4] Consequently, we would expect to find evidence of a more civic behavior (and not just attitudes) in a prosperous economy. In order to examine whether this argument is supported by data, we conduct a complementary analysis of the effect that income has on various measures of criminal behavior and corruption. We find that increases in national income lead to a significant reduction in criminal behavior and corruption.

We also address the question as to whether the effect of economic prosperity on trust affects population groups differentially. Employing interaction terms with individual-level characteristics, we find that the effect of national income on trust is significantly larger among individuals in the low socioeconomic strata, i.e., poorer, less educated, small-town

[4] A model that formalizes this argument is presented in Brueckner et al. (2015).

dwellers.

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 the third section. The main empirical results follow. In this section we also address the exclusion restriction of our instrumental variable. The fifth section focuses on the mechanism of transmission that help explain how national income impact trust, and presents results on heterogeneous effects. The final section concludes with brief remarks.

Data and Sample

We examine the effect of national income on trust by estimating 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. The data cover the interval from 1981 to 2014 through six waves of data assembled over the following periods: the first wave covers 1981–84; the second wave spans over 1990–94; the third wave is held during 1995–98; the fourth wave covers 1999–2004; the fifth wave covers 2005–08; and the sixth wave covers 2010–14. The data include adult citizens at least 15 years old 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,*" and 0, which stands for "*Need to be very careful.*"[5] 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 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:

[5] 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*".

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

where $\Delta \ln(\text{OilPrice})_t$ 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*. For the estimation sample, summary statistics of the oil price shock variable for period *t* are reported in Table 1.

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.

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.

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 at the country and individual levels; 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 does not capture confidence with respect to a specific group (e.g., by ethnicity, organizations or institutions). For this purpose, we employ an estimation strategy set at the individual level. Our baseline econometric model is given by:

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

where $Trust_{ijt}$ is the reported trust level of individual *i* in country *j* in period *t* that corresponds to the year when the survey was conducted. The variable $per\ capita\ GDP\ PPP_{jt}$ 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:

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

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 $E[\ln(per\ capita\ GDP_{jt})\,|\bar{Z}_{jt}]$ stands for the predicted level of log per capita GDP obtained from $\bar{Z}_{jt}$, 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}, corresponds 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 instrumental variables 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 $\pi_0 \neq 0, \pi_1 \neq 0, \pi_2 \neq 0$.

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.

Table 2. Effects of Country's Per Capita GDP on Trust in People, Probit Results

Dependent variable	*Probit*		
	(1)	(2)	(3)
Log GDP per capita, PPP (constant 2011 international $)	0.0974*	0.0993*	0.160**
	(0.0573)	(0.0573)	(0.0794)
Male		-0.0228***	-0.0129
		(0.00701)	(0.00815)
Age in years		-0.000373	-0.000887***
		(0.000237)	(0.000317)
Number of children			-0.00474*
			(0.00282)
Highest educational level attained			
Primary or secondary complete/incomplete			0.191***
			(0.00993)
Marital status			
Married		-0.0312***	-0.0129
		(0.00766)	(0.00960)
Individual wealth			
Income deciles			-0.0219***
			(0.00187)
Constant	-0.264	-0.230	-0.736
	(0.494)	(0.495)	(0.696)
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	164,457	164,044	123,528
LR chi2	13531	13543	11661
Prob > chi2	0.000	0.000	0.000
Log likelihood	-85162	-84935	-63640

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%.

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 instruments 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 1-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 1-percent increase in national income increasing the likelihood of trust by one percentage point.

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***	1.995***
	(0.234)	(0.234)	(0.377)
Male		-0.0229***	-0.0140*
		(0.00700)	(0.00813)
Age in years		-0.000423*	-0.000771**
		(0.000237)	(0.000317)
Marital status			
Married		-0.0309***	-0.0106
		(0.00766)	(0.00959)
Number of children			-0.00564**
			(0.00282)
Highest educational level attained			
Primary or secondary complete/incomplete			0.197***
			(0.00996)
Individual wealth			
Income deciles			-0.0222***
			(0.00187)
Constant	-7.776***	-7.998***	-16.75***
	(2.010)	(2.011)	(3.294)
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	164,457	164,044	123,528
Under identification test (first stage F-statistic)	0.000	0.000	0.000
Wald chi-squared	13617	13635	11853
Wald chi-squared test of exogeneity	14.83	15.85	24.49
Model Wald 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%.

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.

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***	2.205***
	(0.421)	(0.421)	(0.392)
Male		-0.0242***	-0.0155*
		(0.00704)	(0.00820)
Age in years		-0.000441*	-0.000754**
		(0.000239)	(0.000320)
Marital status			
Married		-0.0311***	-0.0101
		(0.00771)	(0.00967)
Number of children			-0.00572**
			(0.00283)
Highest educational level attained			
Primary or secondary complete/incomplete			0.195***
			(0.0100)
Individual wealth			
Income deciles			-0.0236***
			(0.00189)
Constant	-10.05***	-10.73***	-18.55***
	(3.608)	(3.607)	(3.420)
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	162,459	162,046	121,636
Under identification test (first stage F-statistic)	0.000	0.000	0.000
Wald chi-squared	13657	13689	11890
Wald chi-squared test of exogeneity	7.460	8.591	27.97
Model Wald 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***	1.996**
	(0.501)	(0.502)	(0.800)
Male		-0.0262***	-0.0180**
		(0.00718)	(0.00843)
Age in years		-0.000330	-0.000630*
		(0.000246)	(0.000332)
Marital status			
Married		-0.0349***	-0.0163
		(0.00787)	(0.00992)
Number of children			-0.00570**
			(0.00287)
Highest educational level attained			
Primary or secondary complete/incomplete			0.197***
			(0.0103)
Individual wealth			
			-0.0234***
			(0.00193)
Constant	-11.29***	-11.56***	8.714***
	(4.305)	(4.311)	(0.00124)
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	156,790	156,377	116,547
Under identification test (first stage F-statistic)	0.000	0.000	0.000
Wald chi-squared	13578	13599	11712
Wald chi-squared test of exogeneity	7.456	7.802	11712
Model Wald 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%.

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 percent; further, the F-statistic is well above 10.

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***	2.095***
	(0.217)	(0.217)	(0.746)
Male		-0.0241***	-0.0154
		(0.00705)	(0.0121)
Age in years		-0.000419*	-0.000762
		(0.000239)	(0.00101)
Marital status			
Married		-0.0314***	-0.0103
		(0.00771)	(0.0139)
Number oh children			-0.00566***
			(0.00165)
Highest educational level attained			
Primary or secondary complete/incomplete			0.195***
			(0.0450)

Individual wealth			
Individual income			-0.0235***
			(0.00797)
Constant	-6.932***	-7.017***	-17.60***
	(1.863)	(1.862)	(6.504)
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	162,459	162,046	121,636
Under identification test (first stage F-statistic)	0.000	0.001	0.002
Wald chi-squared	13597	13612	444.8
Wald chi-squared test of exogeneity	13.77	14.29	4.014
Model Wald 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***	1.967***
	(0.197)	(0.197)	(0.653)
Male		-0.0259***	-0.0180
		(0.00719)	(0.0115)
Age in years		-0.000289	-0.000638
		(0.000245)	(0.00115)
Marital status			
Married		-0.0350***	-0.0164
		(0.00788)	(0.0130)
Number of children			-0.00574***
			(0.00207)
Highest educational level attained			
Primary or secondary complete/incomplete			0.196***
			(0.0484)
Individual wealth			
Individual income			-0.0235***
			(0.00829)
Constant	-5.688***	-5.724***	-16.49***
	(1.697)	(1.696)	(5.767)

Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Observations	156,790	156,377	116,547
Under identification test (first stage F-statistic)	0.000	0.001	0.002
Wald chi-squared	13496	13511	364.7
Wald chi-squared test of exogeneity	14.32	14.58	4.994
Model Wald 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%.

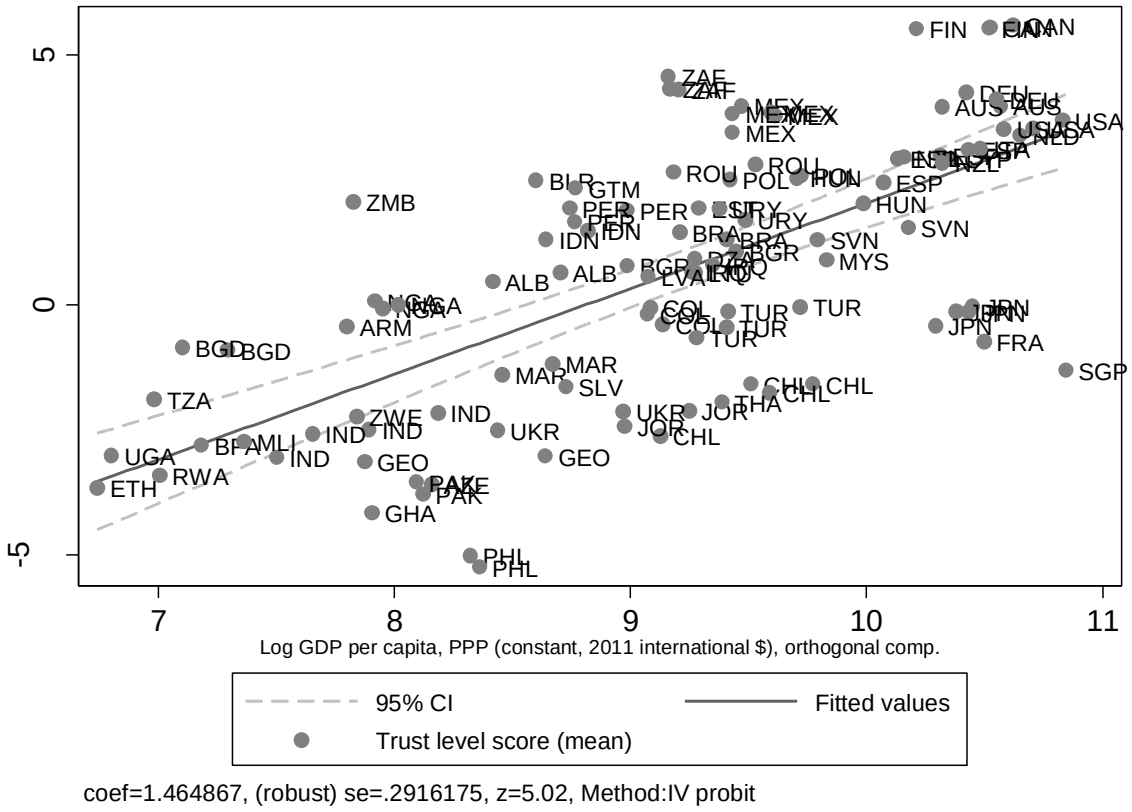
In addition to the results presented above, we also test for heterogeneous effects by introducing an interaction term between GDP and membership in the OECD. The purpose of this is to examine whether the impact of GDP is different in richer countries in relation to poorer ones. In Appendix C we observe 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

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

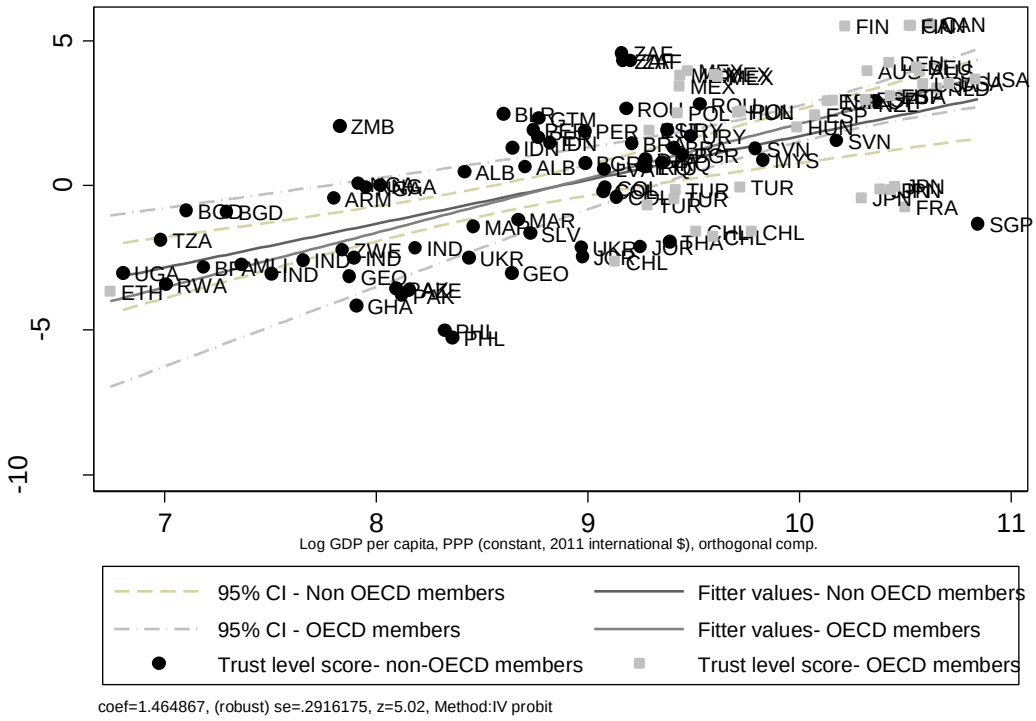
on trust is stronger when instrumenting GDP by plausibly exogenous oil price shocks. Figure 4 shows the estimated slopes for OECD and non-OECD countries. We observe that the slope is somewhat higher for OECD than non-OECD countries, although quantitatively this difference is minuscule and the 95-percent confidence bands overlap.

Figure 3. Trust and log GDP Per Capita, IV Results



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.

In order to further address the exclusion restriction, we apply a Bayesian generalization of the standard 2SLS as developed in Conley et al. (2012).[7] These researchers propose an approach alternative to a regular IV inference by assuming that the instruments are only *plausibly* or approximately exogenous and do not exactly satisfy the exclusion restriction.[8] They assert that the amount of bias associated with the β coefficient not only depends on γ but also on the parameter associated with the first stage. They argue that there

[7] See also Kraay (2010), for a similar concept. A complementary test, the so-called Abadie Kappa, requires the use of a binary instrument, which cannot be applied in our case.

[8] The inference procedures proposed by the authors relax the exclusion restriction of the instrument. Specifically, the method proposes to estimate the following two equations. (i) $Y = X\beta + Zy + e$ and (ii) $X = Z\pi + v$. Here, X is the endogenous variable and Z is the instrument. Theoretically, the standard assumption (exclusion restriction) is that the coefficient γ is equal to zero. Conley et al. (2012) propose a methodology that relaxes the assumption that this coefficient is equal to zero. The authors propose that the previous equations are to be estimated for different levels of γ. Developing this idea, they calculate that $\hat{\beta} \rightarrow \beta + \frac{\gamma}{\pi}$.

is a parameter associated with the first stage estimation that is large enough to allow the estimation of β with negligible bias. We proceed to apply the methods by Conley et al. (2012) to all our estimations shown in Table 3 to Table 7, where we employed specifications of the form $Y = F(X\beta + Z\gamma + e)$ and where *F* is an accumulated normal distribution function. The relevant results are shown in Table 8. In the first panel of this table, we report results from an inference procedure that specifies a set of possible values of γ, labeled the union of confidence interval (UCI). In the second panel, we use the local to zero (LTZ) approximation developed by Conley et al (2012). To apply the LTZ approximation, we use estimates reported by Soares (2004); with these estimates in hand, we generate a distribution for γ. As shown in Table 8, our results are robust to applying both procedures (i.e., relaxing the assumption that the instruments strictly satisfy the exclusion restriction continues to yield a positive impact of GDP per capita on interpersonal trust).

Table 8. Confidence Interval Estimates for the effect of Trust on National Income

	Confidence interval	
Instrumental variables specifications	Lower bound	Upper bound
	A. UCI method gamma [-2,10]	
IV contemporaneous ops, t	0.0446	2.12223
IV lagged ops values, t-1	0.1601	2.3736
IV lagged ops values, t-2	-3.2559	1.0509
IV contemporaneous and lagged ops values: t, t-1, t-2		
Contemporaneous ops, t	0.0508	2.6993
Lagged ops values, t-1	-0.0081	0.0022
Lagged ops values, t-2	-4.63E-04	-5.07E-05
	B. LTZ method one hundred iterations, gamma with mean=4; sd=4	
IV contemporaneous ops, t	0.3641	0.4108
IV lagged ops values, t-1	0.477	0.5661
IV lagged ops values, t-2	0.2976	0.3977
IV contemporaneous and lagged ops values: t, t-1, t-2	0.3665	0.4073

Notes: We report 95% confidence intervals obtained from the inference procedures proposed by Conley et al. (2012). The definition of γ is different across these methods. In panel A, the Union of CI method considers as prior information that the γ takes on values within the interval $[-2, 10]$. The "Local to Zero" method in panel B has as prior that $\gamma \sim N(4, 4)$. One hundred simulations of the coefficient has been made, taking as references to our prior distribution the coefficient sizes presented in Soares (2004). OPS means "oil shock prices", our instrument, as detailed on the text.

It is of interest to quantitatively compare our estimates to those in the literature. In their review article, Algan and Cahuc (2013) report LS estimates of trust on GDP per capita. In their regressions, a one standard deviation increase in the former (about 0.14) is associated, depending on a set of controls, with 0.2 to 0.6 increase in (log) income per capita (see Table 3 there). According to our estimation using the UCI method of Conley et al. (2012), a one standard deviation increase in the instrumented GDP per capita (0.43) causes an increase in trust of between 0.03 and 0.9—thus spanning the point estimates reported in Algan and

Cahuc (2013).[9] In particular, the well documented positive correlation between trust and growth implies that the LS are biased upwards, so that our IV estimates should be expected to be lower than the LS estimates.

Exploring Mechanisms and Heterogeneous Effects

The results shown thus far portray the average effect of national income on interpersonal trust. In this section we focus on plausible channels of transmission underlying this causal effect and report heterogeneous effects.

Crime and Corruption as a Transmission Mechanism

We now explore the impact of national income on crime rates. While earlier economic studies focus on the incentives of criminal behavior as well as its cost and benefits to society, there has been a recent focus on the relationship between crime and development (Levitt and Miles, 2006; Soares, 2004). The relationship between trust and crime rates has been exhibited in Blanco and Ruiz (2013).

We study the effect of national income on crime rates and corruption as a channel using an IV approach, as in the main analysis above.[10] The data we use come from the International Crime Victim Survey (ICVS). The ICVS is a survey developed by an international working group under the coordination of the United Nations Interregional Crime and Justice Research Institute with the goal to address the constraints of official crime records and generate comparative criminological data (Van Dijk et al., 2007). The ICVS has

[9] According to the alternative, LTZ method, the estimated effect is smaller, although still positive. It is to be noted that Algan and Cahuc's sample is a sub-sample of ours, as it does not include the latest WVS wave; and their trust measure assumes four value—which, however, is unlikely to substantially affect the comparison.
[10] See, e.g., Dell (2010) for a similar approach in a different setting.

conducted surveys for 78 countries since 1989, making it one of the most comprehensive tools to study and monitor crime with an international perspective (see Van Dijk, 2010; Van Dijk et al., 2007). It is noteworthy that, while the coverage overlaps with the sample we use in the main estimation, crime data come from a distinct source and pertains to factual information.

We employ the three most frequently reported measures of crime, namely robbery, assault and car theft. When matching the WVS and the ICSV data, we obtain a sample size of nearly 11,000 observations. Table 9 reports the results of a two-stage estimation. As in our core regressions above, the endogenous variable corresponds to GDP per capita, which is instrumented by oil price shocks as previously defined.[11] As shown in columns 1 and 2, when using car theft rates as our dependent variable, we find a negative and statistically significant impact of GDP per capita. The result holds regardless of the type of crime perpetrated and whether we use data on crime that occurred one year or five years prior the survey. Moreover, the direction and size of the coefficients are robust to various specifications of the instrument, which are shown in panels A to C in the same table.[12]

[11] First stages are reported in Appendix E and Appendix F.
[12] Additional specifications with different shock values (i.e., contemporaneous and lagged oil price shocks corresponding to *t-3; t, t-1; t, t-1, t-2*) further confirm our findings. For the sake of economy, these additional results are not included in the paper, but are available upon request.

Table 9. Crime or Corruption Victims and National Gross Domestic Product, Second Stage Estimation Results

Dependent variable:	Victim of Car theft last year	Victim of Car theft last 5 yrs	Victim of Robbery last year	Victim of Robbery last 5 yrs	Victim of Assault last year	Victim of Assault last 5 yrs	Victim of corruption petition in last 5 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel A. IV is contemporaneous oil price shock, *t*						
Log GDP per capita	-0.095	-0.099	-0.072	-0.068	-0.111	-0.114	-0.063
	(0.002)***	(0.002)***	(0.002)***	(0.002)***	(0.004)***	(0.005)***	(0.001)***
Observations	10,910	10,910	10,910	10,910	10,910	10,910	10,910
Wald chi-squared	5,503	4,935	3,354	3,502	870	813	38,751
Model Wald p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Panel B. IV: lagged values of oil price shock, *t-1*						
Log GDP per capita	-1.155	-1.227	-0.696	-0.689	-1.818	-1.901	-0.211
	(0.297)***	(0.316)***	(0.181)***	(0.179)***	(0.493)***	(0.516)***	(0.038)***
Observations	10,910	10,910	10,910	10,910	10,910	10,910	10,910
Wald chi-squared	24.89	24.12	25.17	25.57	16.27	16.27	3354
Model Wald p-value	0.002	0.001	0.002	0.001	0.039	0.000	0.001
	Panel C. IV: Lagged values of oil price shock, *t-2*						
Log GDP per capita	-0.161	-0.176	-0.110	-0.119	-0.307	-0.340	-0.099
	(0.007)***	(0.007)***	(0.004)***	(0.004)***	(0.014)***	(0.016)***	(0.002)***
Observations	9,058	9,058	9,058	9,058	9,058	9,058	9,058
Wald chi-squared	711	707.9	1486	1256	577.9	568.3	6442
Model Wald p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Method of estimation is two-stage IV. The reported coefficients correspond to the second stage estimation. The observations are at the individual level. All the covariates stand as in previous estimations are the following: gender (male, =1); age in years; marital status (married, =1); number of children; highest educational level attained (Primary or secondary level complete or incomplete, =1). Robust standard errors are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: * = 10%; ** = 5%; *** = 1%. Log GDP per capita, PPP (constant 2011 international $)

We find evidence that national prosperity lowers crime rates, which according to the literature shown above, subsequently dampers interpersonal trust. This is consistent with Soares (2014) who finds that a 1-percent increase in a country's average economic growth rate can reduce theft rates by 6 percent. Our findings are also consistent with Fajnzylber et

al. (2002), who employ panel data to show that a 1-percent increase in GDP growth produces a 13.7-percentage point decline in robbery rates. Thus, economic conditions have a significant impact on the incidence of criminal behavior.[13]

Economic growth can serve as an indicator of proper legal economic opportunities, rule of law, and the quality of institutions that enhance the sense of trust in society. This is corroborated by recent cross-country research by Lederman et al. (2002) that shows that a 1-percent increase in the sense of trust among survey respondents was associated with a 1.2-percent decline in homicide rates. Similarly, Buonanno et al. (2009) show that a one standard deviation increase in association density reduced robberies and car thefts by nearly 30 percent (Buonanno et al., 2009). These examples are consistent with higher levels of social capital being linked to lower crime rates.

Corruption is often defined as the misuse of public power for private benefit that involves norms and networks in which members prioritize particularistic gains over broader goals and rules valid for all society (Svensson, 2005; Graf Lamsdorff, 2007). It is a social phenomenon that prevents cooperative behavior and deteriorates social bonds (Morris and Klesner, 2010). Furthermore, it is also a governance issue that reflects the health of a country's legal, economic, political and cultural institutions (Svensson, 2005), defining its democratic performance (Hakhverdian and Mayne, 2012). Corrupt practices diminish trust levels in government and society, generating a vicious circle in which trust acts as both a

[13] Conversely, crime can also have a significant impact in economic growth. For instance, between the 1980s and the mid-2000s, Colombia experimented a slowdown of two percentage points of its GDP's growth rate due to productivity losses that resulted from a four-fold increase in criminality (Cárdenas, 2007). Similarly, the increase of Brazil's crime and homicide rates during the same period had a direct cost of between three to five percentage points of GDP per year as these social issues represented some of the main disincentives for investment in the country (World Bank, 2006).

cause and effect of corruption (Morris and Klesner, 2010; Hakhverdian and Mayne, 2012).[14]

Column 7 in Table 9 shows that per capita GDP has a negative and statistically significant impact on corruption practices. The different panels in this table report three alternative specifications where the instrumental variable is introduced as contemporaneous oil price shocks as well as in lagged form, for one and two periods, respectively. Our point estimates support the view that higher national income leads to a significant reduction in corruption.

Heterogeneous Effects

We now discuss how the effect of national income on trust may differ depending on individuals' socioeconomic background. To this end, we include in our econometric model an interaction between national income and variables that capture the socioeconomic background of individuals. The results are presented in Table 10.

[14] In Mexico, a 10-percent increase in the perception of corruption index leads to a 16-percent decline in interpersonal trust, and those respondents that are more tolerant of corruption are less likely to perceive corruptive practices (Morris and Klesner, 2010). On the other hand, corruption has been associated with the malfunctioning of bureaucratic institutions, generating a negative effect on economic performance and development (Mauro, 1998).

Table 10. Interaction Terms for the Effects of Country's Per Capita GDP (PPP) on Trust in People, Instrumental Variables

	Trust in people		
	(1)	(2)	(3)
	Panel A. IV is contemporaneous oil price shock, t		
Log GDP per capita, PPP (constant 2011 international $)	1.286***	1.399***	1.570***
	(0.381)	(0.381)	(0.346)
Log GDP per capita * Living in a large size (=1)	-0.0595***	-0.0616***	-0.0577***
	(0.0104)	(0.0104)	(0.0105)
Log GDP per capita*High-income individual (=1)	-0.0743***	-0.0754***	-0.0817***
	(0.00926)	(0.00930)	(0.00956)
Log GDP per capita * Inadequate education (=1)	0.160***	0.161***	0.172***
	(0.0112)	(0.0113)	(0.0116)
Observations	92,316	92,176	89,734
Wald chi-squared	7737	7796	7662
Wald chi-squared test of exogeneity	2.527	3.565	8.006
Model Wald p-value	0.000	0.000	0.000
	Panel B. IV: lagged values of oil price shock, t-1		
Log GDP per capita, PPP (constant 2011 international $)	1.731***	1.853***	2.010***
	(0.554)	(0.552)	(0.461)
Log GDP per capita*Living in a large size (=1)	-0.0634***	-0.0658***	-0.0613***
	(0.0112)	(0.0112)	(0.0109)
Log GDP per capita*High-income individual (=1)	-0.0743***	-0.0755***	-0.0817***
	(0.00951)	(0.00954)	(0.00971)
Log GDP per capita * Inadequate education (=1)	0.158***	0.159***	0.170***
	(0.0121)	(0.0122)	(0.0122)
Observations	90,320	90,180	87,744
Wald chi-squared	7753	7817	7685
Wald chi-squared test of exogeneity	3.603	4.480	9.416
Model Wald p-value	0.000	0.000	0.000
	Panel C. IV: lagged values of oil price shock, t-2		
Log GDP per capita, PPP (constant 2011 international $)	2.075***	2.143***	2.125***
	(0.488)	(0.487)	(0.448)
Log GDP per capita * Living in a large size (=1)	-0.0691***	-0.0708***	-0.0643***
	(0.0110)	(0.0110)	(0.0110)
Log GDP per capita*High-income individual (=1)	-0.0765***	-0.0771***	-0.0823***
	(0.00949)	(0.00953)	(0.00978)
Log GDP per capita*Inadequate education (=1)	0.153***	0.155***	0.168***
	(0.0120)	(0.0120)	(0.0124)

Observations	86,557	86,417	84,000
Wald chi-squared	7769	7823	7672
Wald chi-squared test of exogeneity	8.244	9.039	11.68
Model Wald p-value	0.000	0.000	0.000
	Panel D. IV is contemporaneous and lagged values of oil price shock; t, t-1		
Log GDP per capita, PPP (constant 2011 international $)	0.663	0.761*	0.878*
	(0.420)	(0.438)	(0.522)
Log GDP per capita*Living in a large size (=1)	-0.0524***	-0.0545***	-0.0506***
	(0.0185)	(0.0181)	(0.0193)
Log GDP per capita*High-income individual (=1)	-0.0690***	-0.0702***	-0.0761***
	(0.0142)	(0.0140)	(0.0137)
Log GDP per capita * Inadequate education (=1)	0.169***	0.171***	0.183***
	(0.0249)	(0.0246)	(0.0207)
Observations	90,320	90,180	87,744
Wald chi-squared	1.620e+11	1.420e+12	1.220e+11
Wald chi-squared test of exogeneity	0.00231	0.0113	0.155
Model Wald p-value	0.000	0.000	0.000

Notes: The method of estimation is maximum likelihood. The observations are at an individual-level unit. Robust standard errors are in parentheses. Column 1 has results without any covariates; column 2 includes as control variables gender (male, =1), age in years, marital status (married, =1). Column 3 uses the previous control variables and adds: number of children, highest educational level attained (primary or secondary, complete / incomplete, =1) and income deciles. Fixed effects for country and survey years are included. Living in a large size city takes the value of =1 when the individuals lives in city with population over 100 thousand. High-income individuals variable has the value =1 when, based on self-assessment, consider to be members of income deciles from 5 to 10. Inadequate education has the value of =1 when primary or secondary levels are complete/incomplete. 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%.

We see that the effect of an increase in national income on trust is significantly larger among small-town (as opposed to large city) dwellers; among low income (as opposed to high income) and less educated (as opposed to highly educated) individuals. Taken together, this suggests that income growth enhances trust especially among individuals in the lower socioeconomic category. This reinforces Banfield's (1958) speculation that economic prosperity has the potential of enhancing trust, particularly among poorest segments of the population.

It is noteworthy that, while significantly smaller, the effect of national income on trust is still positive and significantly different from zero among parts of the population that are well off. For example, in column 1 the value of the interaction term for large-city dwellers is -0.059; the coefficient on GDP per capita is 1.286. Hence, for an average individual that lives in a large city, the implied effect of a 1-percent increase in GDP per capita on the likelihood of trust is 1.23 percent. If an individual lives in a large city, has high income, and adequate education, the effect is around 1.15 percent.

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, causal 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 average effect on the level of trust. In particular, an increase of 1 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 (2018). The detected effect appears uniform across countries at different levels of economic development, but stronger among poor, less educated, small-town residents.

We hypothesized that economic prosperity affects trust by enhancing civic behaviors. To test this hypothesis, we used a distinct dataset that contains various measures of criminal

behavior and corruption. Reassuringly and consistent with our hypothesis, we found that an increase in national income leads to a sizeable reduction in criminal behavior and corruption.

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Appendix A. List of Countries

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

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

Appendix B. Description of Variables

Variable name	Description
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.
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.
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.
Male	Dichotomous variable; has the value of 1 to indicate "Men" and 0 otherwise. *Source: WVS.*
Age	Continuous variable that reports individual ages in years. *Source: WVS.*
Marital status: married	Dichotomous variable; has a value of 1 to indicate "Married" and 0 otherwise. *Source: WVS.*
Number of children	Continuous variable. *Source: WVS.*
Highest educational level attained	Dichotomous variable; has the value of 1 to indicate "Primary or Secondary complete/incomplete" and 0 otherwise. *Source: WVS.*
Survey year	Year in which the individual reported. Transformed into dichotomous variable to indicate each year value and control for fixed effects. *Source: WVS.*
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. *Source: WVS.*
Living in a large city	Dichotomous variable; has the value of 1 to indicate that the individual lives in a city with population over 100 thousand; and 0 otherwise. *Source: WVS.*
High-income individual	Dichotomous variable; has the value of 1 to indicate that the individual reports, based on self-perception, that he belongs to the income deciles from 5 to 10 The variables takes the value of 0 otherwise. *Source: WVS.*
Victim of car thefts in the last five years	The information is taken by the question: "*Over the past five years have you or other members of your household had any of their cars/vans/trucks stolen? Please take your time to think about it*". The answer is coded into a dichotomous variable; has the value of 1 to indicate "Yes" and 0 if the answer is "No". *Source: ICVS*
Victim of car thefts in the last year	The information is taken by the question: "*Over the past year have you or other members of your household had any of their cars/vans/trucks stolen? Please take your time to think about it*". The answer is coded into a dichotomous variable; has the value of 1 to indicate "Yes" and 0 if the answer is "No". *Source: ICVS*

Victim of robbery in the last five years	The information is taken by the question: "*Over the past five years has anyone taken something from you, by using force, or threatening you? Or did anyone try do to so?*" The answer is coded into a dichotomous variable; has the value of 1 to indicate "Yes" and 0 if the answer is "No". *Source: ICVS*
Victim of robbery in the last year	The information is taken by the question: "*Over the last year has anyone taken something from you, by using force, or threatening you? Or did anyone try do to so?*" The answer is coded into a dichotomous variable; has the value of 1 to indicate "Yes" and 0 if the answer is "No". *Source: ICVS*
Victim of assault in the last year	The information is taken by the question: "*Apart from the incidents just covered (i.e. theft of cars, burglary, attempted burglary, personal theft, sexual offences), have you over the past five years been personally attacked or threatened by someone in a way that really frightened you either at home or elsewhere, such as in a pub, in the street, at school, on public transport, on the beach, or at your workplace?*" The answer is coded into a dichotomous variable; has the value of 1 to indicate "Yes" and 0 if the answer is "No". *Source: ICVS*
Victim of assault in the last five years	The information is taken by the question: "*Apart from the incidents just covered (i.e. theft of cars, burglary, attempted burglary, personal theft, sexual offences), have you over the past five years been personally attacked or threatened by someone in a way that really frightened you either at home or elsewhere, such as in a pub, in the street, at school, on public transport, on the beach, or at your workplace?*" The answer is coded into a dichotomous variable; has the value of 1 to indicate "Yes" and 0 if the answer is "No". *Source: ICVS*
Victim of corruption in the last 5 years	The information is taken by the question: "*In some areas there is a problem of corruption among government or public officials. During 1999, has any government official, for instance a customs officer, police officer or inspector in your own country, asked you or expected you to pay a bribe for his service?"* The answer is coded into a dichotomous variable; has the value of 1 to indicate "Yes" and 0 if the answer is "No". *Source: ICVS*

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.

Appendix E. Crime Victims and National Gross Domestic Product, first stage estimation
Mechanisms of transmission

Dependent variable	Log GDP per capita, PPP (constant 2011 international $)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A. IV is contemporaneous oil price shock, t					
Contemporaneous oil price shock, t	-115.249	-115.249	-115.249	-115.249	-115.249	-115.249
	(3.207)***	(3.207)***	(3.207)***	(3.207)***	(3.207)***	(3.207)***
Constant	9.637	9.637	9.637	9.637	9.637	9.637
	(0.031)***	(0.031)***	(0.031)***	(0.031)***	(0.031)***	(0.031)***
Observations	10,910	10,910	10,910	10,910	10,910	10,910
R-squared	0.483	0.483	0.483	0.483	0.483	0.483
F-statistic	1575	1575	1575	1575	1575	1575
	Panel B. IV is contemporaneous oil price shock, t-1					
Lagged values of oil price shock, t-1	-11.167	-11.167	-11.167	-11.167	-11.167	-11.167
	(2.980)***	(2.980)***	(2.980)***	(2.980)***	(2.980)***	(2.980)***
Constant	9.776	9.776	9.776	9.776	9.776	9.776
	(0.031)***	(0.031)***	(0.031)***	(0.031)***	(0.031)***	(0.031)***
Observations	10,910	10,910	10,910	10,910	10,910	10,910
R-squared	0.447	0.447	0.447	0.447	0.447	0.447
F-statistic	1441	1441	1441	1441	1441	1441
	Panel C. IV is contemporaneous oil price shock, t-2					
Lagged values of oil price shock, t-2	74.963	74.963	74.963	74.963	74.963	74.963
	(2.941)***	(2.941)***	(2.941)***	(2.941)***	(2.941)***	(2.941)***
Constant	10.455	10.455	10.455	10.455	10.455	10.455
	(0.019)***	(0.019)***	(0.019)***	(0.019)***	(0.019)***	(0.019)***
Observations	9,058	9,058	9,058	9,058	9,058	9,058
R-squared	0.463	0.463	0.463	0.463	0.463	0.463
F-statistic	1167	1167	1167	1167	1167	1167
Individual covariates	Yes	Yes	Yes	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The method of estimation is two stage least squares. The coefficients correspond to the first stage estimation. The observations are at the individual-level unit. All the covariates stand as in preceding estimations. Robust standard errors are in parenthesis. 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%.