

## **Trust and Growth**

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## **Summary**

Using data from US states, we find a positive relationship between trust and growth. According to our results, a 10 percentage point increase in trust increases the growth rate of per capita income by 0.5 percentage point, growth rate of housing prices by 1.25 percentage points, and the growth rate of employment by 2.5 percentage points over a decade.

**Keywords:** Trust, Economic Growth

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# Trust and Growth

## 1. Introduction

Since Putnam's (1993) influential study, there is growing interest in how social capital relates to economic growth in the literature. According to Knack (1999), high-trust societies achieve higher economic growth due to lower transaction costs. Since trust protects property and contractual rights, it is not necessary to divert resources from production to protection. Using data from a mixed group of countries, i.e., low, middle, and high-income, both Knack and Keefer (1997) and Zak and Knack (2001) find a positive relationship between trust and economic growth. However, Helliwell (1996), using data from a group of high-income OECD countries, finds a negative relationship. Beugelsdijk and van Schaik (2005), on the other hand, use regional data from high-income European countries, and do not find a relationship at all. As Helliwell (1996) suggests, the next step in unraveling the puzzle requires social capital measures for a broader range of countries and regions, such as US states. In this study, we use data from US states, and find a positive relationship between trust and economic growth regardless of the economic growth measure used. Our results are robust to the endogeneity between economic growth and trust.

## 2. Data

Our measure of trust is from Uslaner (2005). Uslaner (2005) estimates the shares of trusting people in 43 contiguous states and in Alaska in the 1990s using data from several other

surveys in addition to the General Social Survey (GSS).<sup>1</sup> The standard question asked to measure trust is “Generally speaking, do you believe that most people can be trusted, or can you not be too careful in dealing with people?”<sup>2</sup> Using data from US states is quite advantageous since it is more likely that the relationship between the answers to survey trust questions and actual trust differs across countries than across states. Holm and Danielson (2005), for example, show that it differs considerably between Sweden and Tanzania.

As Alesina and la Ferrara (2005) argue, although growth rate of per capita income is a natural measure for cross-country growth regressions due to relative immobility of labor across countries, it is not necessarily the case for the US states. Within the US, labor responds strongly and quickly to income opportunities. Following Glaeser and Saks (2006), in addition to the growth rate of per capita income, we use two different variables as our measure of economic growth: the growth rate of housing prices, and the growth rate of manufacturing employment.

In every specification we control for the initial values of our growth variables as well as the initial level of education and the region dummies. Our measure of education is the share of high school graduates in the 17 year old population. Our per capita income data are from the Bureau of Economic Analysis, manufacturing employment data are from the Bureau of Labor Statistics, and the data on housing prices and education are from the Census Bureau.

### 3. The Results

We first estimate the following basic model by ordinary least squares (OLS) for 43 contiguous US states for the period 1990-2000:

$$Growth_i = Intercept + \alpha Trust_i + \beta \log Initial State Characteristics_i + \gamma Region Dummies_i + u_i .$$

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<sup>1</sup> American National Election Study, Pew Civic Engagement Survey, the Washington Post Trust in government Survey, and the New York Times Millennium Survey.

<sup>2</sup> See Uslaner and Brown (2005) for a discussion of the data.

Second, to control for spatial autocorrelation, we estimate the following spatial autoregressive (i.e., spatial lag) model by maximum likelihood (ML):

$$Growth_i = Intercept + \alpha \cdot Trust_i + \beta \cdot \log Initial\ State\ Characteristics_i + \gamma \cdot Region\ Dummies_i + \rho \cdot W \cdot Growth_i + u_i,$$

where,  $W$  is the spatial-lag weighting matrix and  $\rho$  is the coefficient giving the sign and the strength of spatial autocorrelation in  $Growth$ . We adopt a simple weighting scheme of strict state contiguity, such that  $w_{ij} = 1$  if  $i \neq j$  and state  $i$  is contiguous to state  $j$  and  $w_{ij} = 0$  otherwise.

$W \cdot Growth_i$  is nothing but the average growth rate in state  $i$ 's neighboring states.

The results of the OLS estimation are given in Columns 1, 3, and 5 of Table 1. The estimated coefficient of *Trust* is positive and highly significant in all specifications. According to the results of the specifications 1, 3, and 5, a 10 percentage point increase in *Trust* increases the growth rate of per capita income by 0.5 percentage point, growth rate of housing prices by 1.25 percentage points, and the growth rate of employment by 2.5 percentage points over a decade. A 1 standard deviation increase in *Trust* increases the growth rate of per capita income by almost 0.4 standard deviation, slightly bigger than the standardized coefficient of *Education*. Similarly, according to the results of the specifications 3 and 5, a 1 standard deviation increase in *Trust* increases the growth rate of housing prices by almost 0.2 standard deviation and the growth rate of manufacturing employment by almost 0.5 standard deviation.

The results of the ML estimation are given in Columns 2, 4, and 6 of Table 1. According to Wald, LM, and LR tests, spatial autocorrelation is present in all but two specifications. Even controlling for spatial autocorrelation, the estimated coefficient of *Trust* is positive and highly significant in all specifications. The standardized coefficients of trust are quite similar to the ones estimated by OLS.

#### **4. Robustness of the Results:**

The first robustness issue is the endogeneity of *Trust*. Knack and Keefer (1997) instrument for *Trust* with the share of a country's population belonging to the largest ethnic group while Zak and Knack (2001) with Catholic, Muslim, and Orthodox shares of each country's population. According to World Values Survey (WVS) in the 1990s, the Nordics, the British, and the Germans are the most trusting people. Uslaner (2007) finds that living in states with high Nordic, British, and German population leads to greater levels of trust. Following Uslaner (2007) we use the share of Nordic, British, and German population in a state as our instruments for *Trust*. The results of the instrumental variables (IV) estimation for the basic model and the spatial autoregressive model are given in Columns 1, 3, and 5, and Columns 2, 4, and 6 of Table 2, respectively. As long as the population share of the Nordics, the British, and the Germans affect economic growth through *Trust*, the instruments are theoretically valid. According to the 1<sup>st</sup> Stage F and the Hansen J statistics given in Table 3, they are empirically valid as well. The estimated coefficient of *Trust* is positive and highly significant in all specifications. The second robustness issue is the possible measurement error in *Trust*. Nevertheless, IV estimation does not only help correct for the endogeneity but also the measurement error. The third robustness issue is the presence of outliers. In Knack and Keefer (1997), for example, the results are somewhat sensitive to outliers. To identify the outliers we use Hadi's and Grubbs' methodologies. Neither methodology identifies any outliers in our model.

## **5. Conclusion**

The empirical evidence regarding the relationship between trust and growth is conflicting. It is partly due to the sample of countries/regions used in the analyses. Helliwell (1996) uses a data from a group of high income OECD countries and Beugelsdijk and van Schaik (2005) use data from regions of a group of high income European countries. On the other hand, the relationship between trust and economic growth is more likely to be observed in lower income countries due to the lack of protection of property and contractual rights. Using data from the US states, we provide new evidence of a positive relationship between trust and economic growth and show that even in a high income country such as the US, in which property and contractual rights are protected more than the low income countries, high trust regions achieve higher economic growth.

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Table 1. Trust and Growth

	<i>Income</i>		<i>Housing Prices</i>		<i>Employment</i>	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Trust</b>	0.053 (0.024)**	0.054 (0.025)**	0.125 (0.064)**	0.132 (0.066)**	0.255 (0.056)***	0.243 (0.051)***
<b>Log Income</b>	-0.086 (0.094)	-0.101 (0.074)*	0.259 (0.311)	0.246 (0.188)*	-0.245 (0.140)*	-0.185 (0.149)**
<b>Log Housing Prices</b>	0.010 (0.046)	0.013 (0.033)	-0.473 (0.163)***	-0.485 (0.086)***	-0.132 (0.066)*	-0.139 (0.066)**
<b>Log Employment</b>	0.012 (0.006)**	0.012 (0.005)**	0.048 (0.019)***	0.057 (0.015)***	-0.005 (0.014)	-0.006 (0.011)
<b>Log Education</b>	0.118 (0.063)*	0.116 (0.059)**	0.068 (0.147)	0.109 (0.155)	0.107 (0.135)	0.059 (0.121)
<b>Region Dummies</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Constant</b>	0.351 (0.241)	0.426 (0.210)**	0.946 (0.622)	1.005 (0.507)**	1.644 (0.396)***	1.431 (0.407)***
<b>Wald Test of <math>\rho</math></b>						
$\chi^2$		0.890		3.933		3.093
P-value		(0.345)		0.047		(0.079)
<b>LR Test of <math>\rho</math></b>						
$\chi^2$		0.881		3.708		2.895
P-value		(0.348)		0.054		(0.089)
<b>LM Test of <math>\rho</math></b>						
$\chi^2$		0.717		3.756		2.858
P-value		(0.397)		0.053		(0.091)
<b>R<sup>2</sup>/Log Likelihood</b>	0.24	126.782	0.84	85.609	0.82	97.002
<b>N</b>	43	43	43	43	43	43

Standard errors in parentheses. All tests one tailed except constants. \* p<0.10; \*\* p<0.05; \*\*\* p<0.01.

**Table 2. Trust and Growth: IV Estimation**  
**Instruments: Nordic Americans, German Americans, English Americans**

	<i>Income</i>		<i>Housing Prices</i>		<i>Employment</i>	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<i>Trust</i>	0.047 (0.031)*	0.049 (0.036)*	0.242 (0.118)**	0.263 (0.087)***	0.247 (0.059)***	0.234 (0.079)***
<i>Log Income</i>	-0.086 (0.083)	-0.100 (0.076)*	0.255 (0.269)	0.240 (0.177)*	-0.245 (0.124)**	-0.177 (0.167)
<i>Log Housing Prices</i>	0.011 (0.041)	0.014 (0.034)	-0.494 (0.146)***	-0.509 (0.082)***	-0.131 (0.059)**	-0.139 (0.074)**
<i>Log Employment</i>	0.012 (0.005)**	0.011 (0.006)**	0.055 (0.019)***	0.067 (0.014)***	-0.006 (0.012)	-0.006 (0.012)
<i>Log Education</i>	0.119 (0.059)**	0.117 (0.061)**	0.035 (0.146)	0.077 (0.147)	0.109 (0.125)	0.054 (0.137)
<i>Region Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Constant</b>	0.349 (0.211)*	0.422 (0.217)*	0.974 (0.567)*	1.043 (0.481)**	1.642 (0.349)***	1.401 (0.457)***
<b>Hansen J</b>	4.997		2.884		4.216	
<b>P-value</b>	0.082		0.236		0.121	
<b>Wald Test of <math>\rho</math></b>						
$\chi^2$		0.800		5.308		3.397
<b>P-value</b>		0.371		0.021		(0.065)
<b>LR Test of <math>\rho</math></b>						
$\chi^2$		0.793		4.906		3.134
<b>P-value</b>		0.373		0.027		(0.077)
<b>LM Test of <math>\rho</math></b>						
$\chi^2$		0.640		4.958		2.825
<b>P-value</b>		0.424		0.026		(0.093)
<b>Log Likelihood</b>		125.545		87.798		91.786
<b>N</b>	43	43	43	43	43	43

Standard errors in parentheses. All tests one tailed except constants. \* p<0.10; \*\* p<0.05; \*\*\* p<0.01.  
For the First Stage F Statistic p<0.01.

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