A G D I Working Paper

WP/15/057

Does Trust Matter for Entrepreneurship: Evidence from A Cross-Section of Countries

Oasis Kodila-Tedika
University of Kinshasa
Department of Economics, DRC
oasiskodila@yahoo.fr

Julius A. Agbor
Department of Economics, Stellenbosch University,
Cape Town, 7602, South Africa; Tel.: +1-240-506-2353

2015 African Governance and Development Institute WP/15/057

AGDI Working Paper

Research Department

Does Trust Matter for Entrepreneurship: Evidence from A Cross-Section of Countries

Oasis Kodila-Tedika & Julius A. Agbor

December 2015

Abstract

Differences in trust levels between countries explain the observed discrepancies in entrepreneurial spirit amongst them. We test this hypothesis with a cross-section of 60 countries in 2010. Our findings suggest that about half of the variation in entrepreneurial spirit across countries in the world is driven by trust considerations. This result is robust to regional clustering, to outliers and to alternative conditioning variables. The findings of the study suggest that while formal incentives to nurture entrepreneurship must be maintained, policy-makers should also seek to pay attention to the role of trust cultivated through informal networks.

Keywords: trust, institution, entrepreneurship

1. Introduction

Trust has recently received increasing attention in the economic development literature. Scholars have paid a particular attention to two broad dimensions of trust namely, its causes (see notably, Alesina and La Ferrara, 2002; Bjornskov, 2006;and Smith, 2008) and its impact. In that regard, the impact of trust on economic variables, Knack and Keefer, (1997),Whiteley, (2000), Zak and Knack (2001), Beugelsdijk et al.(2004), Berggrenet al., (2008) find trust to be a key determinant in explaining cross-country differences in economic growth. On their side, Bjørnskov and Méon (2010) find the impact of trust in total factor productivity. Several other authors have been interested in the impact of trust on institutional development and quality (Helliwell and Putnam, 1995; La Porta et al., 1997; Rice and Sumberg, 1997; Knack, 2002; Bjørnskovet al., 2010; Bjørnskov, 2010, 2012), on welfare state design (Bergh and Bjørnskov, 2009), on schooling (Bjørnskov, 2009, 2012), on innovation (Akçomak, and terWeel, 2009),

on corruption (Bjørnskov, 2010), on trade (Greif 1989; Woolcock 1998; den Butter and Mosch 2003), on political and civic involvement (Knack and Keefer 1997, La Porta et al. 1997), on crime prevention (Wilson, 1987), on health (Rose, 2000) and on subjective life satisfaction (Bjørnskov, 2003; Helliwell, 2003).

The present study follows the latter broad approach to the subject of trust by investigating its impact on entrepreneurship. Despite the existence of numerous theoretical foundations linking trust to entrepreneurial spirit, no prior empirical study in the literature to date, to the best of our knowledge, has explicitly tested this relationship. According to Harper (2003), trust is crucial to cultivating entrepreneurship. As business transactions rely on trust: where there is trust, businesses generally thrive. Additionally, most prior studies linking trust to entrepreneurship have utilized a microeconomic or management framework. This paper analyzes this linkage from a macroeconomic perspective. Indeed, nothing genuinely to confirm the results found so far can explain the differences at the country level for entrepreneurship. The specific and sectorial contexts of each country but also micro data effectively validate this argument.

From a macroeconomic viewpoint, the absence of trust need not necessarily constrain business activity as long as formal institutions that bridge the trust gap exist. However, the absence of such formal institutions in many countries highlights the crucial role of trust in nurturing entrepreneurial spirit. Fafchamps (2002) emphasizes this thesis for Sub-Saharan African countries. While Berggren and Jordahl (2006) emphasize the link between social capital and economic freedom, Hafer and Jones (2012) instead emphasizes the connection between economic freedom and entrepreneurship. The present paper goes beyond both preceding views by directly linking entrepreneurship to trust.

The research question this paper seeks to answer is whether trust is necessary for entrepreneurial activity to flourish? An empirical answer to this question would offer great insight into why some countries have superior entrepreneurial culture than others. Also, to the extent that the literature (e.g. Holcombe, 1998 ; Caree & Thurik 2003; Audretsch, et al. 2006; Kirzner, 1997; and Lazear, 2004 &2005) attributes a great role of entrepreneurship in economic development, understanding what drives entrepreneurship is helpful not only in understanding why some countries have superior entrepreneurship culture but also, why some countries are more developed than others.

The paper performs cross-sectional analysis on 60 countries for the year2010. The data for entrepreneurship is from the recently published Global Entrepreneurship Monitor (GEM) by Acs & Szerb (2010). Following the literature, we use the trust variable from the World Values Survey which measures the extent to which people trust each other. These two measures also constitute the novelty of this paper. Indeed, we take a broader view of entrepreneurship than most of the prior studies. Further, our variable has a wider acceptance and is more comparable at the national level.

Furthermore, another major innovation of this paper is the use of the cross-sectional approach at the national level. Despite several studies conducted on the relationship between social capital and small/medium businesses; few have employed this technique as confirmed by Geindre et Dussuc (2012: 12)[1].

We employed a 2SLS methodology using suitable instruments to control for endogeneity of the entrepreneurship variable. The findings does suggest that trust has a strong positive impact on entrepreneurship and the result is robust to the presence of outliers, continental/regional clustering and alternative conditioning variables. Quantitatively, our results do suggest that about half of the variability in entrepreneurial spirit across the world is driven by trust considerations. Further empirical analysis suggest that causality runs from trust to entrepreneurship.

The rest of the paper is organized as follows: section two discusses the conceptual framework of the paper ; while section three discusses the data. Section four presents the methodology, while section five presents and discusses the empirical results. Section six concludes.

2. Conceptual Framework

The role of trust in entrepreneurship is not novel. As we havealready noted, trust is essential to entrepreneurship. A number of authors, notably, Chabaud & Ngijol, (2005), Bhagavatula et al. (2010), Audretsch et. al. (2011) have shown that by creating room for new opportunities, trust enables entrepreneurship. Some other authors have shown that trust facilitates the creation of enterprises, (e.g. Mueller, (2006), Davidsson & Honig, (2003), Rodríguez & Santos, (2007), Clarke & Chandra, (2011) and Deakins et al. (2007)) while others suggest that trust enables access to other resources (e.g. Baron & Markmann, (2003), Runyan et al. (2006), Honig et. al, (2006) and Packalen, (2007)). Trust has also been found to be indispensable in

[1] This study focuses on the period from 2002 to 2011.

the birth of new enterprises (e.g. Geindre (2009) and Aarstad et. al. (2010)) and also for the growth and development of small and medium-sized enterprises (e.g. Bosma et. al. (2004), Mosek et. al. (2007), Han, (2007) and Coviello& Cox, (2007)). While certainly informative and relevant, most of these prior studies linking trust to entrepreneurship have utilized a microeconomic or management framework. There is therefore need for a macroeconomic perspective to the subject, which is the object of the present study.

However, most prior empirical studies have not discussed this relationship. Some studies have empirically investigated the importance of confidence in entrepreneurship, through its effect on innovation (e.g. Akçomak and terWeel, 2009; Doh and Acs, 2010). Because trust affects innovation, we can logically think that trust would be useful in entrepreneurship because it is the foundation of innovation.

Wede fine a production function[2] of entrepreneurship as follows:

$$Q = Q(T^{\theta}, Z) + \varepsilon \qquad (1)$$

Where Q represents entrepreneurship, T, trust, Z traditional determinants and ε, unobservable factors influencing Q. θ measures the externalities related to social capital. If $\theta > 0$, we deduce that $\frac{dQ}{dT} > 0$, social capital thus increases entrepreneurship. If $\theta = 0$, entrepreneurship is orthogonal to T, and if $\theta < 0$, distrust reduces the spirit of entrepreneurship.

Simply put, we can settle for$0 < \theta < 1$, where the average increase in social capital has a positive impact on entrepreneurship.

There are many reasons to consider a relationship between these two variables, such as the work cited above suggests. Akçomak and ter Weel (2009) believe it is easier to finance entrepreneurial activity based simply on the reputation of a company or a person. This in turn can help to create a business or to support a business. Starting a business is not always an individual process: the idea could flourish or die depending on the level of trust and the surrounding business environment. Retention of information is difficult in the presence of a higher confidence, which minimizes the asymmetry of information, further lowering the cost of information and transactions. One can easily get leads for his company, so we can develop entrepreneurial attitudes exchanging with entrepreneurs from various backgrounds. It is also

[2]See Doepke and Zilibotti (2013) for a model.

understandable that confidence stimulates the ambition to become an entrepreneur or own these same attitudes.

3. Data and Descriptive Findings

Following the tradition in the literature, we use the World Values Survey (WVS) trust indicator which surveys the proportion of a population that answers "yes" to the fundamental question: ''in general, do you think that most people can be trusted, or can't you be too careful?'' WVS data for a number of countries has been available since 1981 and is generally accepted as a reliable indicator of trust at the aggregate level. National social trust scores have proved it to be a fairly valid measure of honesty, trust, and trustworthiness. Further, this indicator has been widely utilized in previous works.

Data for the aggregate national entrepreneurship activity is obtained from the Global Entrepreneurship and Development Index (GEDI) of Acs et Szerb (2010). Both the GEDI are comprehensive and multi-dimensional datasets, which seek to uncover the different conditions, including the underlying environment underpinning entrepreneurial success at the micro level. GEDI is a composite index comprising three sub-indexes namely: entrepreneurial attitude, entrepreneurial activity and entrepreneurial ambition. The global entrepreneurship index is the simple arithmetic average of the three sub-indexes. The entrepreneurial attitude sub-index measures the attitude and dispositions of the population of a country towards entrepreneurship, while the entrepreneurial activity sub-index measures the proportion of the population engaged in entrepreneurial activity. Both sub-indexes are influenced by factors such as, market size, level of education of the population, and the business environment in the country. In an attempt to capture the likely influences of these exogenous factors on entrepreneurship spirit, Acs & Szerb (2010) suggested another much more complex sub-index - the entrepreneurial ambition sub-index – which basically captures individuals' ability to create new enterprises. The GEDI database covers seventy-one countries. However, due to missing data for some of the control variables, our study covers only sixty countries.

Acs & Szerb (2010: 6) wrote: "there should be detailed information about the applied data set and the sources of the variables. The 14individual pillars of entrepreneurship used in the construction of our index are calculated by involving more than 963 000 individuals from the 71 countries. The pillars themselves are constructed through an interaction of individual level and institutional variables. All of the institutional variables are from the Global

Competitiveness Index; others are from the Doing business, Index of economic Freedom or from multinational organizations such as the UNIDO or OECD. While we tried to find a single institutional variable for each of the individual variables, sometimes it proved to be not executable. Therefore some of these institutional variables are themselves complex "indexes". Comparing to the previous versions of our index, we avoided the duplication or the multiplication of the same institutional factors in different part of the index."

Table 1 describes the sources of different variables included in this study.

Table 1 Data Sources

Variables	**Sources**
Entrepreneurship	Acs and Szerb, (2010).
Gini	GINI coefficient, (UNDP, Human Development Report, 2004), downloaded from STM103 Global Indicators Shared Dataset, Updated Fall 2005.
Post-communist	Dummy variable. Author's own
Economic Freedom	Heritage Freedom (2010)
Social trust	World Values Survey (2010)
IQ	Lynn and Meisenberg, (2010).
Regulatory quality	World Bank Governance indicator. The measures come from the dataset compile by Kaufmann, Kraay and Mastruzzi at the World Bank. (2010)
MENA	Dummy variable. Author's own
High income	Idem
East Asia and Pacific	Idem
Sub-Saharan Africa	Idem
Education 1 (average years of schooling in population aged 25 and above)	Barro and Lee (2011)
Education 2 (average years of schooling in population aged 15 and above)	Idem
Log GDP per capita	Pen World Tables 7v (2010).
Africa	Dummy variable. Author's own
Americas	Idem
Asia	Idem
Europa	Idem
Oceania	Idem

The empirical analysis of the data follows two steps – the summary descriptive statistics and then the analysis of partial correlations.

Table 2 presents the summary descriptive statistics of the variables used in this study. It follows from the analysis of individual country statistics for the two key variables of interest, namely, entrepreneurial spirit and trust, that Uganda received the lowest score for the

entrepreneurship variable, while Denmark received the highest one. The mean score position was earned by Japan and the coefficient of variation of 46.15 suggests great heterogeneity in entrepreneurial spirit amongst the countries included in the study. Regarding the trust variable, Sweden received the highest score, Russia was at the mean score position while Brazil received the lowest one. Again the coefficient of variation of 51.18 suggests great heterogeneity in trust amongst countries.

Table 2Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Entrepreneurship	60	.39	.18	.1	.76
Gini	54	36.65	9.39	24.00	59.00
Post-communist	60	.20	.40	0.00	1.00
Economic freedom	60	66.20	10.25	37.10	89.70
Trust	53	30.42	15.57	5.77	64.27
IQ	59	93.19	8.28	72.00	108.00
Regulatory quality	52	.58	.90	-1.35	1.94
MENA	60	.18	.39	0.00	1.00
High income	60	.53	.50	0.00	1.00
East Asia and Pacific (EAP)	60	.03	.18	0.00	1.00
Sub-Saharan Africa (SSA)	60	.02	.13	0.00	1.00
Education 1	51	8.97	2.43	3.86	13.09
Education 2	51	9.14	2.15	4.32	12.75
Log GDP per capita	52	9.51	1.44	4.86	12.44
Africa	60	.10	.30	0.00	1.00
Americas	60	.10	.30	0.00	1.00
Asia	60	.28	.45	0.00	1.00
Europa	60	.35	.48	0.00	1.00
Oceania	60	.18	.39	0.00	1.00

Figure 1 presents the scatter plot between Entrepreneurship (y-axis) and Trust (x-axis), and sub-indexes of entrepreneurship and trust for the countries included in our sample. The evidence clearly suggests a positive relationship between these two variables. This positive relationship is further confirmed in Table 3 by a strong statistically significant (at 1%) correlation coefficient of 0.71. The same conclusion obtains when analyzing the relationship between each of the four remaining measures of three sub-indexes and Trust. The estimated coefficient of β from each of the simple linear regression models or OLS model is positive and strongly significant = 0.008 (at 1%) when the dependent variable is entrepreneurial attitudes; β = 0.010 (at 1%) when the dependent variable is entrepreneurial activity; β= 0.006 (at 1%) when the dependent variable is entrepreneurial aspiration. In each of the simple regression models, Trust explains more than one-third of the variations in three sub-indexes: 41.5% of the variations in entrepreneurial attitudes, 30.5% of the variations in voice and accountability, 53.6% of the variations entrepreneurial activity and 31.6% of the variations in entrepreneurial aspiration. In addition, the correlation coefficients between trust and each of sub-indexes are important.

Considering that entrepreneurial spirit (and sub-indexes) is a function of many different factors, these correlation figures must not be taken seriously unless further examination of the partial correlation of these other variables with entrepreneurial spirit on the one hand, and with trust on the other hand, is undertaken. This is the objective of Table 3. As expected, the evidence in Table 3 suggests that entrepreneurship is strongly correlated with many other variables, such as, economic freedoms, human capital and regulatory quality. Hence, the relationship presented in Figure 1 might change or weaken in strength once these other variables are taken into account.

Figure 1: Entrepreneurship and Trust

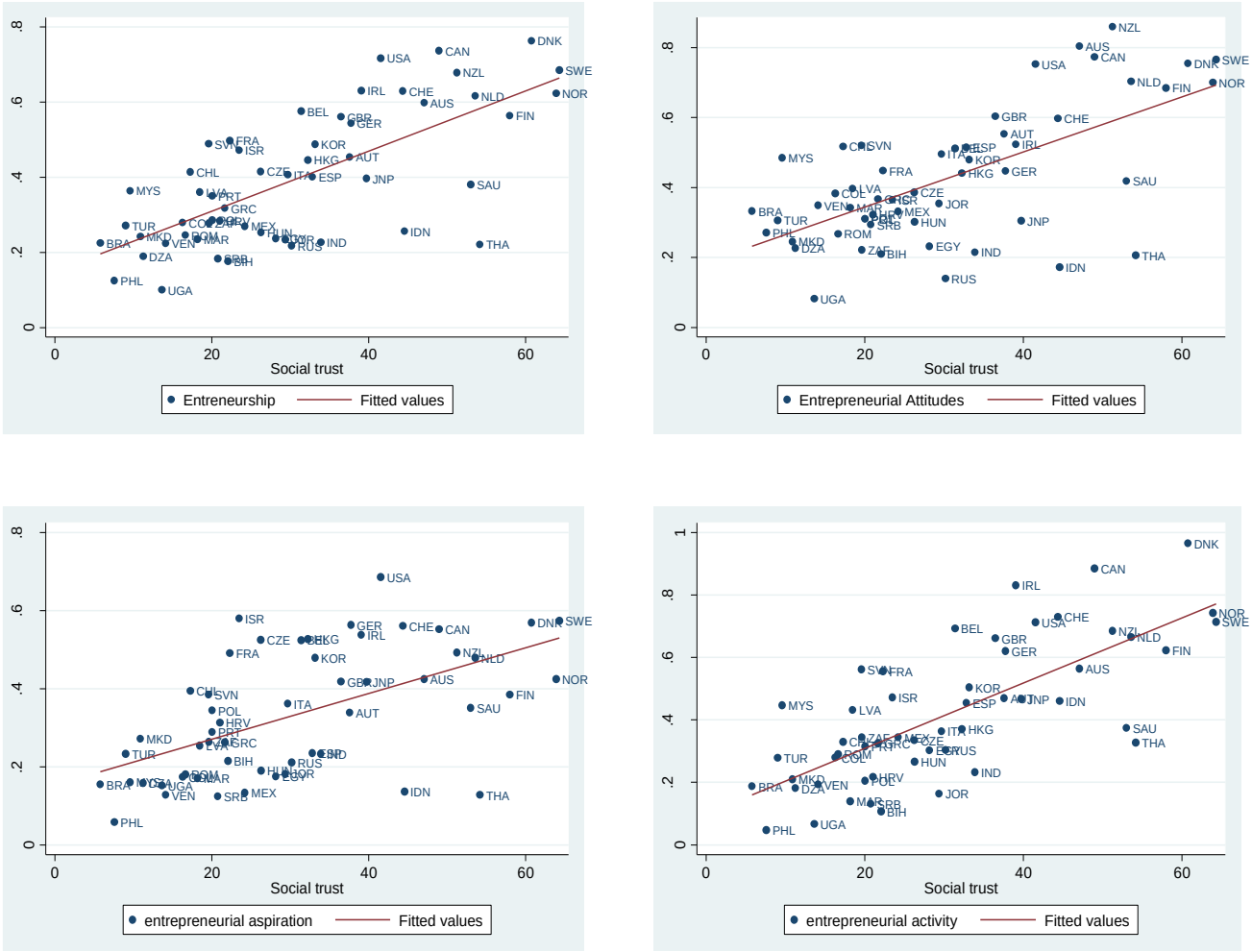

Table 3 Matrix of Correlation Coefficients

	1	2	3	4	4	5	6	7	8	9	10	11	12	13
1 Entrepreneurship	1.00													
2 Gini	-0.41	1.00												
3 Post communist	-0.23	-0.27	1.00											
4 Economic freedom	0.79	-0.27	-0.21	1.00										
5 IQ	0.68	-0.62	0.18	0.54	1.00									
6 Trust	0.71	-0.47	-0.27	0.56	0.51	1.00								
7 Regulatory quality	0.79	-0.48	-0.02	0.79	0.70	0.49	1.00							
8 Log GDP per capita	0.76	-0.41	0.00	0.64	0.71	0.56	0.73	1.00						
9 Education 1	0.72	-0.45	0.20	0.66	0.77	0.43	0.73	0.83	1.00					
10 Education 2	0.70	-0.42	0.17	0.67	0.75	0.42	0.72	0.83	0.99	1.00				
11 High income	0.19	-0.20	0.05	0.13	0.37	0.08	0.30	0.12	0.34	0.31	1.00			
13 Entrepreneurial activity	0.95	-0.40	-0.24	0.73	0.62	0.74	0.74	0.69	0.63	0.62	0.60	1.00		
14 Entrepreneurial aspiration	0.90	-0.45	-0.11	0.71	0.66	0.55	0.74	0.69	0.76	0.73	0.80	0.90	1.00	
12 Entrepreneurial attitudes	0.92	-0.30	-0.26	0.75	0.61	0.65	0.71	0.74	0.64	0.64	0.81	0.92	0.72	1.00

4. Empirical Model

The question we seek to answer in this study is whether differences in trust levels between countries can explain observed differences in entrepreneurial spirit amongst these countries? We specify a regression model of the form (following Hafer and Jones (2012):

$$\text{Entrepreneurship}_i = \alpha + \beta\text{Trust}_i + \delta\text{Control}_i + \varepsilon_i \qquad (2)$$

Where for Entrepreneurship, we use GEDI as the main indicator. Subsequently, we will use entrepreneurial attitude, entrepreneurial activity and entrepreneurial ambition as alternative proxies for entrepreneurship. Trust is our variable of interest and thus the parameter of interest is β. $\text{Control}_i = (x_1; \ldots; x_n)$ is a vector of control variables, including the following: a dummy of high income countries, dummy variable for post-communist countries, the index of economic freedoms, human capital variables[3] (IQ, years of schooling), indices of inequality (Gini), and a dummy to capture different geographical factors (namely regional dummies). ε_i is the error term.

Following Bjornskov & Foss (2008) and Hafer & Jones (2012), we control for the influence of communism on entrepreneurial spirit by including a dummy variable for former communist states. The idea is very simple for this variable: communism is a system openly against private initiative. Thus, it is obvious to consider its impact on entrepreneurship. Also, following Bjornskov & Foss (2008) and Hafer & Jones (2012), we include the Gini coefficient to control for income inequality. The idea being that, sufficiently low incomes might constrain would-be entrepreneurs from realizing their dreams while also potentially motivating some other individuals into entrepreneurial activity as a means of breaking out of poverty. We also control for the level of development of a country by including a dummy for high income countries, the idea being that advanced countries necessarily provide more conducive environments for entrepreneurial activity. The evidence in Glaeser, Kerr & Ponzetto (2010) and Glaeser, Rosenthal & Strange(2010)suggests that entrepreneurial activity flourishes most in urban centers and advanced countries have more urban centers than under-developed countries. The dataon high level of income levels come from Kalonda-Kanyamaand Kodila-Tedika (2012). Acs (2006) has found higher levels of education to be associated with higher levels of entrepreneurial activity, while Hafer and Jones (2012)

[3] As suggested in the literature (see, Hafer & Jones, 2012), both variables – IQ and schooling years – can be maintained in the same regression so as to capture competing aspects of human capital.

recently show that entrepreneurship spirit is a positive function of the level of IQ. Thus, human capital being an important driver of entrepreneurial activity, we control for this by including the Intelligence Quotient (IQ)[4] and the average of years of schooling. We measure intelligence using the IQ data by Lynn and Meisenberg (2010), which has also been used by Jones and Schneider (2010) and Hafer & Jones (2012). Following Bjornskov & Foss (2008); and Hafer & Jones (2012), we include a measure of economic freedom to control for the influence of economic freedom on entrepreneurship. Finally, we include regional dummies to take account of the specificities of different regions of the world.

We perform our analysis on the empirical model specified in equation (1) above using essentially ordinary least square (OLS) regression model. To correct for likely heteroskedasticity, we present white-corrected standard errors.

Reverse causality is a concern in this study. Indeed, trust is a variable that is not entirely endogenous. Trust at the national level may be affected by entrepreneurship. Some believe that in extreme cases, entrepreneurship encourages greed, which in turn creates mistrust, through the exploitation that it generates. This is essentially the view of Marxist theories. If so, then variations in trust between citizens at the national level is driven by the spirit of enterprise – resulting in reverse causality. Further, in our case, we can think, for example, of variables such as tax rates, and labor forces participation that have been omitted resulting in omitted variable bias. Two Stage Least Squares (2SLS) is employed to correct for the fact that we cannot control for all the possible sources of endogeneity in the association between trust and entrepreneurship. This technique requires the instruments to be correlated with confidence, but not correlated with entrepreneurship. The instruments use dare those that have been used in Bjørnskov (2010,2012), namely, monarchy, the pronoun drop and the average temperature. The author justifies theoretically these instruments as follows: "I firstly include a dummy for whether countries are monarchies, which Bjørnskov (2007) find to be approximately eight percentage points more trusting than countries without hereditary institutions. Secondly, I follow Tabellini (2008) approach of study in including a dummy variable for whether a country's predominant language allows dropping the subjective pronoun, that is, Chomsky's (1981) ''pro-drop'' characteristic. Tabellini's argument rests on Kashima and Kashima (1998) in arguing that cultures in which the language forbids dropping the personal pronoun traditionally have been more respectful of individual rights and have

[4] See Lynn & Vanhanen (2012) for literature on this subject.

therefore developed stronger trust norms." (Bjørnskov, 2012:6). "These are supplemented by the average temperature in the coldest month of the year, based on the premise, dating back to Aristotle, that trust and social cohesion historically has been relatively more important for survival in regions with cold winters, and that cultures of such regions may have selected high-trust institutions through an evolutionary process."(Bjørnskov, 2010:336)

Beyond the use of these dedicated instruments; we use standard statistical approaches to validate them. On the one hand, we use the Sargan and Hausmann tests for over identifying, the results accompany each estimate and secondly we look at the behavior of these instruments in the first stage regressions. These regressions are presented in the following table.

Table 4First-stage regressions

	Social trust			
	Entreneurship	**Entrepreneurial attitudes**	**Entrepreneurial activity**	**Entrepreneurial aspiration**
Monarchy	5.214	7.197**	7.197**	7.197**
	(3.946)	(3.672)	(3.672)	(3.672)
Pronoundrop	10.819***	8.709**	8.709**	8.709**
	(3.813)	(3.820)	(3.820)	(3.820)
Temperature	0.124	-.360	-.360	-.360
	(0.262)	(.281)	(.281)	(.281)
R^2	0.86	0.84	0.84	0.84
Obs	39	39	39	39

Notes: Absolute values of t-statistics appear in parentheses* p<.05; ** p<.1; *** p<.01. All regressions are estimated using White (1980) heteroskedasticity correction. All regressions include a constant term.

All regressors in the following table are naturallyinsertedintotheseestimates.Wereproducethecoefficientsofinstrumentalvariables. We observe the significance of all the instruments, except temperature. We therefore proceed with these results to estimate the 2SLSwith these instruments.

To further test the robustness of our results, and consistent with the approach by Bjørnskov (2010); we consider the influence of outliers. The approach is to eliminate outliers using both the Student test and the Iteratively Weighted Least Squares (IWLS) techniques. These two latest techniques therefore permit to verify whether the results found are not driven by the

presence of outliers. As further test of robustness, we use regional clusters to account for regional heterogeneity and also use alternative conditioning variables.

4 Econometric Findings

4.1 Regression Results with GEDI

4.1.1 Main regression results

The main regression results are presented in Table 5. The results in Model 1 shows a positive and highly statistically significant relationship between trust and entrepreneurship, basically confirming Figure 1's theoretical predictions. The relationship between trust and entrepreneurship weakens in magnitude and statistical significance (now significant at the 10% level) when all other controls (excluding controls for regional specificities) are included, as Model 2 suggest. This relationship remains intact when the model is extended to include regional dummies[5] (Model 3). Model 4 employs the 2SLS technique and uses the variables pronoun drop, monarchy and average temperature as instruments – the instruments are those of Bjørnskov (2010, 2012). The p-values from the Sargan and Hausman test validate our approach and the empirical results in Model 4 do suggest that causality runs from trust to entrepreneurship.

The results in Table 5 thus confirms the strong explanatory power of trust on entrepreneurship. In particular, that trust explains about 50 percent of the variation in entrepreneurial spirit in the sample of countries considered. Other determinants found to have an important impact on entrepreneurship include, former communist background, economic freedoms, and human capital. While a former communist background was found to negatively affect entrepreneurship, economic freedom and human capital (measured by the average years of schooling) instead has a strong positive impact. The statistical significance of the former communist background variable is however unstable and changes with the introduction of controls for regional specificities.

Table 5 Main Regression Results

Variables	Model 1	Model 2	Model 3	Model 4
Trust	.008***	.003*	.003*	.006**
	(.001)	(.001)	(.001)	(.003)
Gini		-.000	-.001	.002
		(.002)	(.002)	(.004)
Post communist		-.091*	-.106*	-.037

[5] Some regions were dropped due to multicollinearity.

		(.048)	(.045)	(.093)
IQ		.004	.004	.004
		(.003)	(.003)	(.004)
Economic freedom		.006*	.006*	.004
		(.003)	(.002)	(.003)
High income		-.010	-.019	-.007
		(.028)	(.027)	(.041)
Education 1		.022*	.019*	.012
		(.010)	(.008)	(.015)
SSA			.010	.051
			(.032)	(.068)
MENA			-.076**	-.083
			(.045)	(.072)
EAP			-.074**	-.138
			(.041)	(.103)
R^2	0.50	0.82	0.83	0.86
Obs	53	47	47	39
Sargan				0.30
Basmann				0.42
OLS	Yes	Yes	Yes	No
2SLS	No	No	No	Yes

Notes: Absolute values of t-statistics appear in parentheses* p<.05; ** p<.1; *** p<.01. All regressions are estimated using white (1980) heteroskedasticity correction. All regressions include a constant term.

The likely intuition for this could be that former communist countries that fail to undertake institutional reforms to favor entrepreneurship are likely going to continue witnessing the detrimental effects of communism whereas those countries that reform their institutions to make them conducive to entrepreneurship are less likely to suffer the negative effects.

Income inequality measured by the Gini coefficient, has a negative but statistically insignificant effect on entrepreneurship while the level of development of a country, as well as all the regional dummies are statistically insignificant. If anything, the lack of statistical significance of the sub-Saharan African dummy suggests that entrepreneurial weakness is not purely a sub-Saharan African phenomenon. If one would pursue the argument further, the positive sign on the sub-Saharan African dummy as opposed to the negative signs on the Middle-East & North Africa (MENA) and East Asia & Pacific dummies; suggests that entrepreneurship can evolve favorably in sub-Saharan Africa if certain conditions, probably institutional reforms, are met.

We test for the robustness of our main results in the next section (section 4.1.2).

4. 1. 2 Robustness Checks

We conduct two forms of robustness checks namely, continental clustering outlier observations and endogeneity (Table 6) and using alternative conditioning variables, outlier observations and endogeneity (Table 7). It makes sense to perform a continental clustering considering the extent of heterogeneity observed in both variables – trust and entrepreneurship – across countries included in our sample. We would have wished to use an alternative variable for trust in our robustness checks but the non-availability of suitable proxies constrained this option. We were thus left with the sole option of using alternative conditioning variables, which is the approach that has been used in some studies, see notably, Potrafke (2011). There are a number of differences between the conditioning variables in our main results (Table 5) and Table 7. First, instead of Economic freedom used in Table 5, we use regulatory quality in Table 6. Also, instead of Education 1 (average years of schooling in population aged 25 and above) used in Table 5, we use instead Education 2 (average years of schooling in population aged 15 and above) in Table 6. We also use a dummy variable for GDP per capita instead of high income countries. Finally, we use dummies for regional classification of countries instead of continents. Of course, the decision to use alternative proxies for Economic freedom and human capital is justified by the fact that both variables were significant in our main regression. As we have already explained, the ideal robustness check would involve using alternative proxies for the principal explanatory variable (trust) but data constrains limited this option. We were thus left with the option of using alternative proxies for the chief conditioning variables, hoping to minimize bias in our results that would have been brought about by measurement errors in our conditioning variables.

Table 6 Robustness Checks using Regional Clusters, Outlier and endogeneity

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Trust	.008***	.003*	.029*	.003*	.003*	.003*	.008*
	(.002)	(.000)	(.001)	(.001)	(.001)	(.001)	(.004)
Gini		-.000	-.001	-.000	-.001	-.001	.004
		(.001)	(.001)	(.002)	(.002)	(.002)	(.006)
Post communist		-.091*	-.106*	-.129 **	-.115**	-.120*	-.022
		(.026)	(.026)	(.043)	(.041)	(.049)	(.110)
IQ		.004	.004	.003	.003	.004	.004**
		(.002)	(.002)	(.002)	(.003)	(.003)	(.004)
Economic freedom		.006	.006	.005	.008***	.005*	.004
		(.003)	(.003)	(.002)	(.002)	(.002)	(.005)
High income		-.010	-.018	-.005	-.014	-.012	.020
		(.020)	(.019)	(.024)	(.023)	(.030)	(.049)
Education 1		.022	.019	.022	.019*	.020*	.011
		(.011)	(.011)	(.008)	(.007)	(.010)	(.014)
SSA			.010	-.015	.023	-.021	-.019*
			(.030)	(.034)	(.037)	(.064)	(.043)
MENA			-.076*	-.071	-.047	-.076*	-.033**
			(.035)	(.045)	(.043)	(.044)	(.068)
EAP			-.074	-.069	-.023		-.134***
			(.044)	(.044)	(.041)		(.093)
R^2	0.50	0.82	0.83	0.86	0.87		0.88
Obs	53	47	47	46	45	47	37
Outliers				Slovenia	Slovenia Venezuela		Slovenia Venezuela
IWLS	No	No	No	No	No	Yes	No
OLS	Yes	Yes	Yes	Yes	Yes	No	No
2SLS	No	No	No	No	No	No	Yes

Notes: Absolute values of t-statistics appear in parentheses* p<.05; ** p<.1; *** p<.01. All regressions are estimated using White (1980) heteroskedasticity correction except model 4, 5 and 6. All regressions include a constant term.

In Models 4 and 5 of Table 6, we control for the influence of outliers on our main results. The residuals from the Student test allow us to eliminate only Slovenia from Model 4, while both Slovenia and Venezuela were eliminated from Model 5. Besides diminishing the magnitude of the coefficient of the trust variable, the exclusion of these countries from the sample does not significantly reduce the impact of trust on entrepreneurship. However, the impact of economic freedoms and education – which previously were insignificant – becomes statistically important, while communism also gains in statistical significance. However, the inconvenience associated with the estimation of Models 4 and 5 is that we lose a great deal of degrees of freedom owing to the limited number of observations. To correct for this, we proceed alternatively by maintaining the same specification as in Models 4 and 5 but this time employing a different econometric technique – the IWLS technique (see Model 6). The empirical observation in Model 6 is that this also does not substantially change our main results. In other words, the impact of trust on entrepreneurship is robust to the presence of

outliers. Model 7 explores the 2SLS technique on the empirical specification of Model 5, which is a dual means of controlling for likely simultaneity and for the presence of outliers. The results confirm a positive statistically significant impact of trust on entrepreneurship. Using alternative conditioning variables and controlling for the presence of outliers and endogeneity in Table 7 basically upholds our main result: that trust matters for entrepreneurial spirit.

Table 7 Robustness Checks using Alternative Conditioning Variables, Outliers and endogneity

Variables	Model 1	Model 2	Model 3	Model 4
Trust	.004***	.003*	.003*	.007*
	(.001)	(.001)	(.002)	(.003)
Gini	.001	.001	-.001	.004
	(.002)	(.003)	(.003)	(.005)
Post communist	-.084**	-.099*	-.113*	-.076
	(.042)	(.043)	(.051)	(.074)
IQ	.003	.004	.003	.006
	(.002)	(.004)	(.004)	(.004)
Regulatory quality	.075***	.075***	.086**	.023
	(.024)	(.028)	(.030)	(.039)
Log GDP per capita	.012	.007	-.010	-.002
	(.016)	(.021)	(.022)	(.026)
Education 2	.015	.017**	.019	.024*
	(.010)	(.010)	(.013)	(.013)
Africa		.014	-.032	.0061
		(.075)	(.086)	(.076)
Asia		-.027	-.104	-.071
		(.084)	(.087)	(.078)
Europe		-.022	-.069	-.000
		(.063)	(.081)	(.057)
Oceania		.008	-.035	-.024
		(.057)	(.083)	(.051)
Americas		-.004	-.035	.017
		(.075)	(.090)	(.073)
R^2	0.82	0.83		0.88
Obs	47	47	47	37
IWLS	No	No	Yes	No
OLS	Yes	Yes	No	Yes
2SLS	No	No	No	No
Outliers				Slovenia Venezuela

Notes: Absolute values of t-statistics appear in parentheses* p<.05; ** p<.1; *** p<.01. All regressions are estimated using White (1980) heteroskedasticity correction except model 3. All regressions include a constant term.

As observed in Tables 6 and 7, both specifications do not fundamentally change our main finding: that trust matters for entrepreneurial spirit.

4.2 Regression Results with sub-indexes

Regressions in Table 8 relate to the components of GEDI. We consider the same control variables as in the previous tables. Estimates are made in two stages. Initial estimates using the explanatory variables in Table 5. The explanatory variables in Table 7 are used in the second part of the Table 8.

Table 8 Result with sub-indexes

	Entrepreneurial attitudes			**Entrepreneurial activity**			**Entrepreneurial aspiration**		
Trust	.004*	.003**	.013***	.005***	.006***	.008	.000	.000	-.001
	(.002)	(.001)	(.004)	(.002)	(.002)	(.006)	(.001)	(.001)	(.004)
Method	OLS	IWLS	2SLS	OLS	IWLS	2SLS	OLS	IWLS	2SLS
R^2	0.7538		0.83	0.7693		0.78	0.76		0.77
Obs	47	47	47	47	47	47	47	47	39
Sargan			0.198			0.303			0.082
Basmann			0.308			0.428			0.148
Robustness Checks using Alternative Conditioning Variables									
Trust	.003*	.003	.010*	.006***	.006***	.006	.001	.001	.001
	(.002)	(.002)	(.004)	(.002)	(.002)	(.005)	(.001)	(.001)	(.004)
Method	OLS	IWLS	2SLS	OLS	IWLS	2SLS	OLS	IWLS	2SLS
R^2	0.76		0.84	0.76		.77	0.72		0.70
Obs	39	39	39	39	39	39	39	39	39

Notes: Absolute values of t-statistics appear in parentheses* p<.05; ** p<.1; *** p<.01. All regressions are estimated using White (1980) heteroskedasticity correction except model 3. All regressions include a constant term.

For entrepreneurial attitudes, trust is statistically related to this variable. This relationship is not a correlation. We are in the presence of causality. There is a strong correlation between entrepreneurial activity and trust. However, the single linear relationship observed between the two variables entrepreneurial aspiration and trust in Figure 1 disappears completely. We thus find a similar result by changing certain variables by other measures and estimation techniques.

6. Conclusion

This paper sought to investigate whether differences in trust levels between countries can explain differences in entrepreneurial spirit amongst them. We employed a 2SLS methodology using suitable instruments to control for endogeneity of the entrepreneurship. The findings does suggest that trust has a strong positive impact on entrepreneurship and the result is robust to the presence of outliers, continental/regional clustering and alternative

conditioning variables. Quantitatively, our results do suggest that about half of the variability in entrepreneurial spirit across the world is driven by trust considerations.

The implications of this findings are that, to spur entrepreneurial spirit, countries that lack formal trust-building institutions, for instance, sub-Saharan African countries, can benefit from creating conditions that favor the expansion of informal networks where trust is cultivated.

Our study has been limited by a number of factor amongst which are sample size, unique time period of study, the lack of a rigorous treatment of endogeneity issues and an exploration of the transmission mechanisms between trust and entrepreneurship. Further studies should consider probing deep into these important issues.

Acknowledgements

The authors deeply thank Christian Bjørnskovfor helpful comments. However, the author sare responsible for all errors and omissions that may occur in the text.

7. References

Aarstad, J., Haugland, S. A. & Greve, A. (2010). Performance Spillover Effects in Entrepreneurial Networks: Assessing a Dyadic Theory of Social Capital. *Entrepreneurship Theory and Practice*, 34(5), 1003–1019.

Acs, A.J. & Szerb, L. (2010). The Global Entrepreneurship and Development Index (GEDI). Paper presented at "Opening Up Innovation: Strategy, Organization and Technology", Imperial College, London, June, 2010.

Acs, Z.J. (2006). How is entrepreneurship good for economic growth? *Innovations* 1:1, 97-107.

Akçomak, I. S. & terWeel, B. (2009).Social capital, innovation and growth: Evidence from Europe, *European Economic Review*, 53(5), 544-567.

Alesina, A. &La Ferrara, E. (2002). Who Trusts Others? *Journal of Public Economics*, 85 (2), 20-34.

Audretsch, D. B., Aldridge, T. T.& Sanders, M. (2011). Social capital building and new business formation: A case study in Silicon Valley. *International Small Business Journal*, 29(2), 152–169.

Audretsch, D.B., Keilbach, D.B. and Lehmann, E.E. (2006) *Entrepreneurship and Economic Growth*. Oxford: Oxford University Press.

Baron, R. A.and Markman, G. D. (2003). Beyond social capital: The role of entrepreneurs' social competence in their financial success. *Journal of Business Venturing*, 18(1), 41–60.

Berggren, N. & Jordahl, H. (2006). Free to trust? Economic freedom and social capital. *Kyklos*, *59*, 141–169.

Berggren, N., Elinder, M. & Jordahl, H. (2008). Trust and Growth: A Shaky Relationship. *Empirical Economics* 35, 251–274.

Bergh, A. & Bjørnskov, C. (2009). Historical Trust Levels Predict Current Welfare State Design, IAREP/SABE 2009 conference in Halifax,

Beugelsdijk, S., de Groot, H. L. F. &van Schaik, A. (2004). Trust and economic growth: A robustness analysis. *Oxford Economic Papers* 56:118−34.

Bhagavatula, S., Elfring, T., Van Tilburg, A. &Van De Bunt, G. G. (2010). How social and human capital influence opportunity recognition and resource mobilization in India's handloom industry. *Journal of Business Venturing*, 25(3), 245–260.

Bjørnskov, C. (2003). The happy few: Cross-country evidence on social capital and life satisfaction. *Kyklos* 56:3−16.

Bjørnskov, C. (2006). Determinants of Generalized Trust: A Cross-Country Comparison. *Public Choice*, 130, 1-21.

Bjørnskov, C. (2009). Social Trust and the Growth of Schooling. *Economics of Education Review* 28, 249-257.

Bjørnskov, C. (2010). How does Social Trust lead to Better Governance? An Attempt to Separate Electoral and Bureaucratic Mechanisms. *Public Choice* 144, 323-346.

Bjørnskov, C. (2012). How Does Social Trust Lead to Economic Growth? *Southern Economic Journal* 2012, 78(4), 1–24

Bjørnskov, C. &Foss, N.J. (2008). Economic freedom and entrepreneurial activity: Some cross-country evidence. *Public Choice, 134*, 307-328.

Bjørnskov, C. & Méon, P-G.(2010). The productivity of trust, CEB Working Paper N° 10/042.

Bjørnskov, C., Dreher, A. & Fischer, J. (2010). Formal Institutions and Subjective Well-Being: Revisiting the Cross-Country Evidence, European Journal of Political Economy, 26(4), 419-430, December.

Bosma, N., Van Praag, M., Thurik, R. & De Wit, G. (2004).The value of human and social capital investments for the business performance of startups. *Small Business Economics,* 23(3), 227–236.

Caree, M.A. & Thurik, A.R. (2003).The impact of entrepreneurship on economic growth. In Acs and Audretsch, eds. *International Handbook of Entrepreneurial Research*.

Chabaud, D. & Ngijol, J. (2005).La contribution de la théorie des réseaux sociaux à la reconnaissance des opportunités de marché. *Revue internationale P.M.E*., 18(1).

Clarke, R. &Chandra, R. (2011).Bridging voids: constraints on Hispanic entrepreneurs building social capital. *International Journal of Entrepreneurship and Small Business*, 14(2), 286.

Coviello, N. E. & Cox, M. P. (2007).The resource dynamics of international new venture networks. *Journal of International Entrepreneurship*, 4(2-3), 113–132.

Davidsson, P. & Honig, B. (2003).The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18(3), 301–331.

Deakins, D., Ishaq, M., Smallbone, D., Whittam, G. &Wyper, J. (2007).Ethnic Minority Businesses inScotland and the Role of Social Capital.*International Small Business Journal*, 25(3), 307–326.

Doepke, M. & Zilibotti, F. (2013), Culture, Entrepreneurship, and Growth, NBER working paper 19141.

den Butter, F. A. G. &Mosch, R. H. J. (2003). Trade, trust and transaction cost. Tinbergen Institute Discussion Paper No 03-082/3, Tinbergen Institute, The Netherlands.

Doh, S. & Acs, Z. (2010). Innovation and Social Capital: A Cross-Country Investigation, *Industry & Innovation*, 17(3), 241-262.

Fafchamps, M. (2002), Networks, communities and markets in SSA; implications for firm growth and investment, *Journal of African Economies* 10, 109–142.

Geindre, S. (2009). Le transfert de la ressource réseau lors d'un processus de reprise. *Revue international P.M.E.*, 22(3-4), 109–137.

Geindre, S. & Dussuc, B. (2012), Capital social, théorie des réseaux sociaux et recherche en PME : une revue de la littérature, dans "11ème congrès CIFEPME (Congrès International francophone en entrepreneuriat et PME), Brest : France.

Glaeser, E. L., Kerr, W. R. & Ponzetto, G.A.M. (2010). Clusters of entrepreneurship, *Journal of Urban Economics*, 67(1): 150-168.

Glaeser, E. L., Rosenthal, S. S. &Strange, W. C. (2010). Urban economics and entrepreneurship, *Journal of Urban Economics*, 67(1): 1-14.

Greif, A. 1989. Reputation and coalitions in medieval trade: Evidence on the Maghribi traders. *Journal of Economic History* 49:857−82.

Hafer, R.W. &Jones, G. (2012).IQ and Entrepreneurship: International Evidence, mimeo.

Han, M. (2007).Developing social capital to achieve superior internationalization: A conceptual model. *Journal of International Entrepreneurship*, 4(2-3), 99–112.

Harper, D. (2003).*Foundations of entrepreneurship and economic development*. Routledge, London.

Helliwell, J.F. (2003). How's life? Combining individual and national variables to explain subjective well–being. *Economic Modelling*, *20*, 331–360.

Helliwell, J.F. &Putnam, R. (1995).Economic growth and social capital in Italy. *Eastern Economic Journal*, *221*, 295–307.

Holcombe, R.G. (1998). Entrepreneurship and economic growth. *The Quarterly Journal of Austrian Economics* 1(2): 45-62.

Honig, B., Lerner, M., & Raban, Y. (2006). Social Capital and the Linkages of High-Tech Companies to the Military Defense System: Is there a Signaling Mechanism? *Small Business Economics*, 27(4-5), 419–437.

Jones, G. & Schneider, W.J. (2010). IQ in the production function: evidence from immigrant earnings. *Economic Inquiry* 48, 743-755.

Kalonda-Kanyama, I. & Kodila-Tedika, O. (2012).Quality of Institutions: Does Intelligence Matter?, Working Papers 308, Economic Research Southern Africa.

Kirzner, I. (1997). Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature* 35(1): 60-85.

Knack, S. (2002). Social capital and the quality of government: evidence from the US states. *American Journal of Political Science*, *46*, 772–785.

Knack, S. & Keefer, P. (1997). Does social capital have an economic pay-off? A cross-country investigation. *Quarterly Journal of Economics*, 112, 1251–1288.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R.W. (1997). Trust in large organizations. *American Economic Review*, *87*, 333–338.

Lazear, E.P. (2004). Balanced skills and entrepreneurship. *American Economic Review*, 94, 208-211.

Lazear, E.P. (2005). Entrepreneurship. *Journal of Labor Economics*, 23, 649-680.

Lynn, R. & Meisenberg, G. (2010). National IQs calculated and validated for 108 nations. *Intelligence, 38*, 353-360.

Lynn, R. & Vanhanen, T. (2012). National IQs: A review of their educational, cognitive, economic, political, demographic, sociological, epidemiological, geographic and climatic correlates. *Intelligence*. doi:10.1016/j.intell.2011.11.004.

Mosek, L., Gillin, M. & Katzenstein, L. (2007).Evaluating the donor: enterprise relationship in a not-for-profit social entrepreneurship venture. *International Journal of Entrepreneurship and Small Business*, 4(5), 586.

Mueller, P. (2006). Entrepreneurship in the Region: Breeding Ground for Nascent Entrepreneurs? *Small Business Economics*, 27(1), 41–58.

Packalen, K. A. (2007). Complementing capital: The role of status, demographic features, and social capital in founding teams' abilities to obtain resources. *Entrepreneurship Theory and Practice,* 31(6), 873–891.

Potrafke, N. (2011). Intelligence and Corruption. University of Konstanz, Department of Economics Working Paper No.37.

Rice, T.W. & Sumberg, A. (1997).Civic culture and democracy in the American states. *Publius*, *23*, 99–114.

Rodríguez, M. J. & Santos, F. J. (2007). Women nascent entrepreneurs and social capital in the process of firm creation. *International Entrepreneurship and Management Journal*, 5(1), 45–64.

Rose, R. (2000). How much does social capital add to individual health? A survey study of Russians. *Social Science and Medicine* 51:1421−35.

Runyan, R. C., Huddleston, P. & Swinney, J. (2006). Entrepreneurial orientation and social capital as small firm strategies: A study of gender differences from a resource-based view. *The International Entrepreneurship and Management Journal*, 2(4), 455–477.

Smith, A. (2008). The Determinants of Trust: An Experimental Approach, CEA 42nd Annual Meetings Friday, June 6 - Sunday, June 8, University of British Columbia, Vancouver.

Whiteley, P. (2000). Economic growth and social capital. *Political Studies*, *48*, 443–466.

Wilson, W. J. (1987). *The truly disadvantaged*. Chicago: University of Chicago Press.

Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society* 27:151−208.

Zak, P. &Knack, S. (2001). Trust and Growth. *The Economic Journal*, 111 (470), 295-321.