Economic freedom, culture, and growth

Claudia R. Williamson · Rachel L. Mathers

Abstract How do economic freedom and culture impact economic growth? This paper argues that culture, as measured by the World Values Surveys, and economic institutions associated with economic freedom are both independently important for economic prosperity, but the strength of their impact can be better understood only when both are included in the growth regression. Our results indicate that economic freedom is more important than culture for growth outcomes, suggesting substitutability between the two. We posit that culture is important for growth when economic freedom is absent, diminishing in significance once economic freedom is established.

Keywords Culture · Informal institutions · Economic freedom · Economic growth

JEL Classification O43 · P50 · Z1

1 Introduction

Economic institutions, such as private property, rule of law, and contract enforcement are extremely important for economic growth and development. As defined by North (1990), institutions can be thought of as the "rules of the game," both formal and informal, which govern actions through incentives. Formal institutions are codified structures or written rules, whereas informal institutions are inclusive of cultures, norms, and conventions enforced by social custom. Economists independently link both formal and informal institutions to growth and development, but the relative effects of the two remain to be seen. Following this logic, we argue that economic institutions and culture both need to be accounted for when analyzing economic growth.

C.R. Williamson (✉)
Development Research Institute, Department of Economics, New York University, New York,
NY 10012, USA
e-mail: claudia.williamson@nyu.edu

R.L. Mathers
Charles G. Koch Doctoral Fellow, Department of Economics, West Virginia University, Morgantown,
WV 26506, USA
e-mail: rachel.mathers@mail.wvu.edu

Our analysis is unique in that we include measures of culture *and* measures of economic institutions in our growth equation. To measure economic institutions, we rely on the widely used Economic Freedom of the World Index compiled by the Fraser Institute. Economic freedom, in its most compact definition, refers to the protection of private property rights and the freedom of voluntary transactions (Gwartney et al. 1996). Noting these key elements, De Haan et al. (2006) conclude that the vast majority of studies support the positive link between economic freedom and growth.[1] To capture culture, we rely on the World Values Surveys to measure cultural attributes that are relevant for economic exchange.[2] A recent development in this literature is the discussion of the direct association between economic performance and culture (for example Guiso et al. 2006; Licht et al. 2007; Tabellini 2008a, 2009).

The main goal of this study is to incorporate 'cultural capital' into the freedom-growth framework. More generally, the analysis can be viewed as contributing to the literature attempting to understand how institutions matter for economic development. By controlling for both economic institutions and economic culture, we disentangle the relative effects of each and determine empirically the significances of their impacts on economic outcomes. This analysis can be viewed as providing insight into whether economic freedom and culture are complements or substitutes. Our main focus is on relative effects, not the interaction or feedback between culture and freedom, as a way of first uncovering how economic freedom *and* culture may affect economic prosperity.

To do so, we use a fixed effects model from 1970 to 2004 and include several robustness checks. Our results suggest that, independently, both culture and economic freedom contribute to economic prosperity. However, once we control for both culture and economic freedom simultaneously, the strong association between culture and growth becomes much weaker, while, overwhelmingly, economic freedom retains a positive and highly significant relationship with economic growth. We view these results as suggesting that culture and economic freedom may act as substitutes where, in the absence of economic freedom, culture provides the core institutional functions such as protecting property rights and enforcing contracts; however, once the institutions associated with economic freedom are credible, there is less need to rely on the informal mechanisms of culture.

2 Conceptual link to growth

2.1 Direct associations

As mentioned above, the direct link between economic freedom and growth is robustly discussed in previous literature. The theoretical underpinning regarding this link is also well established. As De Haan and Sturm (2000: 3) note, "since the time of Adam Smith, if not before, economists and economic historians have argued that the freedom to choose and supply resources, competition in business, trade with others and secure property rights are central ingredients for economic progress."

Culture, especially in the economic growth literature, is largely ignored or assumed away as a constant. However, as Boettke (2009: 436) aptly states, "We cannot assume away cultural influences as economists have often done." The inclusion of culture is a recent development, with both theoretical and empirical studies lending credence to the hypothesis

---

[1]For example, Gwartney et al. (1996), Dawson (1998), Gwartney et al. (1999, 2004), De Haan and Sturm (2000), Carlsson and Lundström (2002), Weede and Kämpf (2002), Bengoa and Sanchez-Robles (2003), Berggren (2003), Berggren and Jordahl (2005), Weede (2006), Bjørnskov (2007, 2009).

[2]Each of these measures is discussed in greater detail below.

that informal rules and culture shape economic outcomes (North 1990, 2005; Chamlee-Wright 1997; Knack and Keefer 1995, 1997; Grier 1997; Duffy and Stubben 1998; Barro and McCleary 2003; Pejovich 2003; Guiso et al. 2006; Licht et al. 2007; Boettke et al. 2008; Williamson and Kerekes 2009).

Tabellini (2008a, 2009) finds a strong causal relationship between culture and economic development across different European countries. Williamson (2009) empirically analyzes the interaction between formal political constraints and informal institutions and finds that the existence of well-developed informal institutions is a strong determinant of economic development regardless of the strength of the formal rules.[3] Additionally, Grief (1994) and Putnam (1993) conclude that cultural concerns and beliefs must be considered when devising strategies for economic development if these policies are to be successful and self-sustaining.

In order to further understand how culture may affect economic growth, we narrow the concept to focus on several specific indicators of culture that are identified as being relevant for economic interaction and exchange. One can think of this subset as 'economic culture,' defined by Porter (2000: 14) as "the beliefs, attitudes, and values that bear on economic activities of individuals, organizations, and other institutions. This narrowing process enables us to provide a more in-depth analysis of the connection between culture and economic growth" (Patterson 2000).

Our economic culture variable is based on the methodology found in Tabellini (2008a, 2009) and is constructed by identifying four distinct categories of culture that should shape behavior related to social and economic interaction and, thus, economic growth and development. These four components are trust, respect, individual self-determination, and obedience, which serve as rules governing interaction between individuals, including market production and entrepreneurship. In general, trust, respect, and individual self-determination are thought to stimulate social and economic interaction, whereas obedience is thought to limit economic interaction and development by decreasing risk-taking, a trait essential to entrepreneurship.

The link between higher trust societies and economic growth is well-documented, citing the impact on transaction and monitoring costs as one of the main mechanisms through which trust matters (Landa 1994; Fukuyama 1996; Knack and Keefer 1997; La Porta et al. 1997; Woolcock 1998; Zak and Knack 2001; Beugelsdijk et al. 2004; Francois and Zabojnik 2005; Berggren et al. 2008; Bjørnskov 2009, 2010).

Self-determination is a quantitative measure of the amount of control individuals feel they have over individual choices and their lives. If individuals view economic success or failure as a result of their own efforts (i.e., high levels of self-determination), they will work harder in order to earn a greater payoff for their productivity and increase their welfare. According to this line of reasoning, the greater an individual's 'locus of control,' the greater the overall level of economic development in their country (Banfield 1958).

Respect can be viewed as a measure of generalized versus limited morality, where generalized morality implies abstract rules governing behavior both within and between groups, while limited morality lacks general principles to govern interaction between groups. In a country with low levels of respect, limited morality may be the status quo, so that opportunistic behavior when interacting with those outside of an individual's small group is condoned (Platteau 2000). According to this line of reasoning, higher levels of respect should lead to higher levels of economic development.

---

[3]This analysis categorizes countries into different institutional arrangements based on various combinations of informal and formal institutional scores.

Finally, the fourth cultural measure, obedience, is the more controversial component but is included to capture how individualism is viewed. If children are taught to be obedient and individualism is frowned upon, people may be less likely to engage in the risk-taking essential for entrepreneurship (Harper 2003). Due to its negative impact on individual autonomy and risk-taking, high levels of obedience may result in less economic interaction, thereby hampering economic development.

Given the existing literature showing the separate importance of culture and economic freedom as engines of growth, the next logical question is what happens when both factors are taken into account?

2.2 Substitutes or complements?

Theoretically, the relationship between economic freedom and culture could reasonably be expected to go either way—they may be substitutes or complements. As discussed above, both culture and economic freedom independently affect economic growth. Once both are included in the same regression, if either culture or freedom dominates the other, this suggests that the two are substitutes. However, if both remain significant, culture and freedom are complementing one another in supporting economic growth.

For example, a culture conducive to economic growth may choose to formalize the informal institutions into institutions associated with economic freedom. Once the formal rules are credible, the informal norms and mechanisms once relied upon for economic interaction and exchange, such as trust networks, may be rendered much less important. If this is the case, economic freedom should dominate culture in the growth regression, suggesting a substitution effect.

The substitution effect may go in the other direction if culture is more important than economic freedom. This would suggest that culture is providing the institutional rules governing economic activity that leads to higher economic growth. The literature on self-enforcing cooperation and exchange supports the idea that informal institutions can substitute for formal law. For example, it is argued that public production of law and formal legal systems are not necessary to establish and enforce property rights (Benson 1989a, 1989b; Ostrom 1990; Greif 1993; Greif et al. 1994; Leeson 2007a, 2007b, 2007c, 2008).

On the other hand, there also are ample reasons for thinking that these two key variables are complements and should both be significant in the growth regression. Culture or economic freedom may, independently, contribute to economic growth, but their independent effects might be far weaker than the impact of having *both* formal and informal institutions of freedom. For example, a culture rich in trust prompts some exchanges, yet the combination of a trusting culture *and* a government that enforces laws against predation and honoring private property rights is the key to sustained and large-scale economic growth. Several studies show that culture enhances economic freedom and vice versa (for example, see Berggren and Jordahl 2006; Heinemann and Tanz 2008; Tabellini 2008b; Aghion et al. 2009).[4]

The hypotheses of substitutability and complementarity both have theoretical merit. Therefore, we turn to empirical investigation to shed light on the relative impact of each.

---

[4]We recognize the possible feedback mechanisms between both culture and economic freedom; however, we are mainly interested in understanding the possible substitution or complement effects at a given level of culture and freedom.

3 Data

3.1 Culture

To measure culture, we utilize data from the World Values Surveys to quantify trust, self-determination, respect, and obedience. These surveys capture individual beliefs and values reflecting local norms and customs, i.e., culture (The EVS Foundation and the WVS Association 2006). In order to maximize sample size, we pool all countries surveyed in any of the five waves and aggregate the survey answers to create a culture variable for each time period.[5]

One question from the survey is identified that is most closely correlated with each trait. For example, trust is measured as the percentage of respondents answering 'most can be trusted' to the question, "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" Self-determination is measured using the question, "Some people feel they have completely free choice and control over what happens to them. Please use this scale (from 1 to 10) where 1 means 'none at all' and 10 means 'a great deal' to indicate how much freedom of choice and control in life you have over the way your life turns out." We determine an aggregate control component by averaging all the individual responses and multiplying by ten.

To measure respect, the following question is used: "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five." The percentage of those surveyed that chose "tolerance and respect for other people" is used to measure respect. The same question is used to measure obedience, but in this case, the percentage of those surveyed that chose obedience as being an important trait for children learning at home.

Individual responses are aggregated for each country. A comprehensive culture measure is achieved by extracting the first principal components of all four traits. This process extracts the common variation between all four components, reducing the four independent variables into an overall net measure of culture that is conducive to economic interaction and exchange. We use principal component analysis to ensure that our results are not sensitive to the construction of the variable. The benefit of using this technique over simply summing the four cultural components is that we do not have to make rigid assumptions about how each component will affect the dependent variable.[6] The index is normalized between zero and ten, with a higher score implying stronger informal norms that support economic growth relative to countries with lower scores.[7] Since we are concerned with the overall impact of culture, this aggregate variable serves as the main focus of our empirical analysis.[8]

---

[5]The time periods of the surveys are 1981–1984, 1989–1993, 1994–1999, 1999–2004, and 2005–2007.

[6]Appendix 5 reports the correlations and eigenvectors from the principle component analysis.

[7]In order to maximize our number of periods for the panel data, the culture variable is constructed as follows. The first wave of surveys (1981–1984) represents culture in 1984. The second wave (1989–1993) is used to create the culture variable in 1989. The surveys from 1994–1999 are used to create culture for 1994. The fourth wave, from 1999–2001, represents the culture variable for 1999, and the latest wave is used to create the culture variable for 2004.

[8]Given that the culture variable is an index of these four cultural attributes, we cannot speak to the extent to which individual elements exert an independent influence on economic growth. Rather, our culture variable should be interpreted as an aggregate measure of informal cultural norms conducive to exchange as opposed to a measure of individual components of culture.

3.2 Economic freedom

To measure economic freedom, we utilize the well-cited and established Economic Free-dom of the World Index compiled by the Fraser Institute (Gwartney et al. 2008). The index measures the level of economic freedom, utilizing 42 different components, on a scale from zero to ten, with ten representing a greater degree of freedom. These components can be grouped into five broad categories: size of government, monetary policy and price stabil-ity, legal structure and security of private ownership, freedom to trade with foreigners, and regulation of credit, labor, and business. Each of these categories represents a subset of the variables used to construct the broader index of economic freedom.[9]

3.3 Control variables

In addition to economic freedom and culture, we also employ a variety of control vari-ables that may affect a country's growth rate. We follow the existing literature on eco-nomic freedom and growth in selecting our variables (for example, Levine and Renelt 1992; Dawson 1998; Gwartney et al. 2004). Our standard control vector includes initial real Gross Domestic Product (GDP) per capita in 2000 constant dollars (log form) as a condition-ing variable, the investment share of real GDP (2000 constant dollars), and the population growth rate.[10] Initial GDP per capita and investment share of GDP are taken from Penn World Tables version 6.2 (Heston et al. 2006). Population growth is collected from World Development Indicators 2006.

   We include the investment share as one of our standard control variables because of the well-documented positive relationship between the rate of investment in physical capital and the rate of growth (Levine and Renelt 1992). However, we acknowledge a potential endogeneity problem, as highlighted by De Haan et al. (2006), of including both economic freedom and the investment rate in the same regression. Several studies show that economic freedom influences growth directly through a productivity-enhancing channel and indirectly through an investment effect (Dawson 1998; Bengoa and Sanchez-Robles 2003; Gwartney et al. 2004). We include investment in our main specification but address the endogeneity concern in a later section.

   In addition to the standard control vector, we also include other explanatory variables, as suggested by the existing development literature, which include urban population, country size, educational attainment, geography, and legal origin. We use the log of the total area of a country to control for its size. Urban population is measured by the percentage of the population living in an urbanized area. Educational attainment is measured as the number of pupils enrolled in primary school. We use latitude, or distance from the equator, as our geographical measure. Legal origin captures the effects of common versus civil law. We control for the effect of past legal institutions by including legal origin as dummy variables

---

[9]We recognize the availability of alternative institutional indices (such as Heritage Foundation's Index of Economic Freedom and ICRG's average protection against risk of expropriation); however, due to the long time period and sample size of countries covered by the Fraser index, we find it to be the most suitable for our analysis.

[10]In addition to these standard controls, a measure of human capital or the level of education is often con-trolled for as well. However, we do not control for human capital in our main specification, but add it in as robustness, due to the high correlation between education measures and culture (see Appendix 4).

representing English and French origin.[11] Appendix 1 provides a summary description of all data used in the analysis along with their sources.

4 Empirical analysis and results

We implement panel analysis (from 1970 to 2004) using five-year averages. We first provide a benchmark specification as baseline and a point of comparison with previous studies. We then turn to our main model specification, where we run fixed effects (with robust standard errors) regressions controlling for a variety of variables. We report all results controlling for initial income level. Appendix 2 lists all countries in the analysis as well as their average (from 1970–2004) score and rank for the culture index, economic freedom index, and growth rate. Summary statistics are provided in Appendix 3.

4.1 Panel benchmark specification

As briefly mentioned above, we recognize that many of our variables of interest and our control variables are correlated with one another (see Appendix 4 for a pairwise correlation matrix). For example, culture is correlated with economic freedom (0.52), investment (0.54), and initial GDP per capita (0.59). Also, economic freedom is correlated with investment (0.48), initial GDP per capita (0.68), and urban population (0.55). Although our main variables are correlated with each other and with some of the additional controls, we believe that it is important to include these variables in order to substantiate our results. In order to do so, we rely on a variety of regression specifications and acknowledge the possibility of endogeneity among our independent variables. In order to address this issue, we show the results with a variety of combinations of the variables in addition to implementing lagged values in an attempt to minimize the endogeneity effect (presented in Sect. 5).

As a benchmark, we first show the basic relationship between economic growth and our main variables of interest: culture and economic freedom. To do so, we employ ordinary least squares (OLS) and fixed effects estimations on the panel dataset. The benchmark regressions are shown in Table 1. We report results for culture and economic freedom independently as well as controlling for both in the same regression.

Column (1) shows that culture is positive and highly significant, directly affecting economic growth. The OLS results suggest that a one unit increase in the culture index (going from Romania to Luxembourg, for example) increases the growth rate by 0.44 (or 0.92 for the fixed effect estimation) percentage points, thus supporting previous work on culture and growth. According to the fixed effects results, a one standard deviation increase in the culture index increases growth by 1.67 percentage points, a rather substantial result when compared to the 3.54 average growth rate of our sample of countries.

---

[11]The positive link between education and development and growth is well documented (Mankiw et al. 1992; Barro 2001, 2002). Diamond (1997), Gallup et al. (1999), and Sachs (2001, 2003) argue that geography has a direct impact on economic growth due to climate, the disease environment, endowment of resources, and transactions costs. Therefore, we include latitude to control for the impact of geography on growth. The idea that many countries have a distinct legal origin is identified by La Porta et al. (1999, 2004) and is shown to shape financial, legal, and economic institutions and outcomes (Djankov et al. 2003). Common law, imposed during British colonization, is referred to as English legal origin, and civil law, imposed by French colonizers, is French legal origin.

Table 1 Economic freedom, culture, and growth; Panel regressions—benchmark specification

| | Dependent var: growth rate | | | | | |
| | OLS | | | Fixed effects | | |
	(1)	(2)	(3)	(1)	(2)	(3)
Culture	0.44***		0.13	0.92**		0.36*
	(0.14)		−0.11	(0.38)		(0.10)
Econ freedom		0.78***	0.95***		1.14***	1.52***
		(0.13)	(0.22)		(0.13)	(0.40)
Initial gdppc (log)	−1.88***	−0.74***	−1.93***	−5.39**	−4.44***	−4.75***
	(0.51)	(0.15)	(0.29)	(2.31)	(0.58)	(1.32)
Constant	18.11***	5.31***	14.33***	47.50**	33.07***	35.40***
	(4.26)	(1.02)	(1.97)	(19.6)	(4.79)	(10.12)
Observations	205	678	181	205	678	181
Number of countries				87	128	75
Adj. *R*-squared	0.11	0.06	0.25	0.13	0.16	0.23

Note: Robust standard errors are in parentheses. Significance level: *** at 1%, ** at 5%, * at 10%

Column (2) reports that economic freedom positively and significantly affects growth. A one unit increase in economic freedom increases the growth rate by 0.78 or 1.14 percentage points, depending on the specification. A one standard deviation increase in economic freedom results in a 1.45 percentage point increase in growth (according to the fixed effects estimation), supporting the well-established positive and significant economic freedom and growth relationship.[12]

In column (3) we combine culture and economic freedom in the regressions to start disentangling the substitutability versus complementarity between economic freedom and culture. When controlling for economic freedom, culture is insignificant in the OLS regression but is significant at the 10% level in the fixed effects regression. Economic freedom retains its positive and highly significant (at the 99% level) relationship with growth in both specifications. For example, column (3) for the fixed effects model shows that a one standard deviation increase in culture and freedom increases growth by 0.65 percentage points and 1.93 percentage points, respectively. Also, in the fixed effects model, the joint significance of the F-statistics from columns (1), (2), and (3) are 8.74, 53.78, and 10.09, respectively, and are significant at the 99% level. This suggests that we explain more of the variation in growth when controlling for both culture and freedom than when controlling for culture alone. These results suggest that economic freedom is a strong contributor to economic performance, while culture displays a positive but milder effect on growth, lending support to the substitution hypothesis.

---

[12]Columns (1) and (2) are not included in other specifications as these regressions are not the focus of analysis to determine the complement or substitute relationship.

Table 2 Economic freedom, culture, and growth; Panel fixed effects regressions with controls

	Dependent var: Growth rate				
	(1)	(2)	(3)	(4)	(5)
Culture	0.31	0.32	0.24	0.27	0.28
	(0.02)	(0.20)	(0.16)	(0.20)	(0.22)
Econ freedom	1.40***	1.31***	2.42***	1.29***	1.30***
	(0.39)	(0.41)	(0.38)	(0.41)	(0.40)
Invest/GDP	0.16	0.16	0.31***	0.12	0.13
	(0.11)	(0.11)	(0.05)	(0.10)	(0.10)
Pop. growth	−0.22	0.05	−1.95***	0.14	0.01
	(0.70)	(0.73)	(0.62)	(0.73)	(0.77)
Urban pop. %		0.11	−0.43***	0.24**	0.23**
		(0.13)	(0.11)	(0.12)	(0.11)
Area (log)		40.17	−1,399**	215	268
		(335.9)	(604)	(353)	359
Primary sch. enrollment			6.79***		
			(1.43)		
Geography				1.46	
				(0.89)	
English legal origin					0.62
					(0.47)
French legal origin					0.11
					(0.45)
Initial gdppc (log)	−5.23***	−6.20	−4.63**	−7.14***	−7.15***
	(1.41)	(1.89)	(1.69)	(1.85)	(1.77)
Constant	37.95***	−474.02	18,296	−2,713	−3,378
	(10.44)	(4,295)	(7,882)	(4,507)	4,585
Observations	181	179	48	166	166
Number of countries	75	73	26	73	73
Adj. R-squared	0.25	0.26	0.93	0.31	0.31

Note: Robust and clustered standard errors are in parentheses. Significance level: ***at 1%, **at 5%, *at 10%

4.2 Core panel analysis and results

We now turn to our main model specification, where we implement a fixed effects model, controlling for both culture and economic freedom and a variety of additional variables.[13]

---

[13]The Hausman test confirmed the superiority of a fixed effect model over a random effects model. Since the culture index does not vary much over time we do not control for year dummies, as this would potentially eliminate any possible impact from culture.

In all five regression specifications, culture is insignificant, while economic freedom is positive and significant at the 99% level, lending further support for the substitution theory. Regression (1) suggests that a one unit increase in the freedom index increases growth by 1.40 percentage points. To gain a different perspective, if a country improves from the lowest score on the freedom index to the highest, it would experience an increase in growth by almost 10 percentage points, tripling the sample average. Freedom's coefficient is similar in all five regressions except when controlling for educational attainment. Once education is included in the regression, the coefficient on freedom almost doubles, and the R-squareds go from an average of 0.28 to 0.93, suggesting that this specification suffers from severe endogeneity. As expected, education has a strong positive and significant relationship with growth. Also, all other variables, except for culture, are significant in this specification. This is the only regression where investment, population growth, and area are significant.[14] Urban population is significant in three out of four regressions, although it switches signs. Geography and legal origin are insignificant.[15]

Although the additional control variables do not add much explanatory power to the model, as suggested by the similar R-squareds from the baseline specification (except when education is included), we do acknowledge that our model is only explaining approximately 25% of the variation in growth. We believe this is due to our cautious approach with our control variables.

Overall, we view our benchmark and core analysis as providing evidence that culture and economic freedom may actually behave as substitutes. The results suggest that economic institutions supporting private property rights, rule of law, and enforcement of contracts are a strong determinant of economic growth. This result holds in both models and across a variety of regression specifications. Our results show a mild, positive, and significant direct relationship between culture and economic growth; however, when controlling for economic freedom, culture is significant only in one out of seven regressions, a result consistent with the substitution hypothesis. We view this as suggesting that culture's connection with economic growth may be more complicated than previously suggested (for example, see Tabellini 2008a).

5 Sensitivity analysis

5.1 Correlation or causation?

Our first robustness check attempts to minimize endogeneity and reverse causality biases in our results. The possibility that economic growth may cause more economic freedom, as well as cultivate 'better' culture, is a plausible argument (see Glaeser et al. 2004). It may be that our strong results above are due to the fact that countries that grow tend to become freer. The utilization of panel analysis above does help minimize these concerns; however, in order to provide robustness to these results, we perform two different sensitivity checks, where we rely on lagged and future values of our main variables to 'test' changes in our results.

---

[14]Investment may lose its significance due to the endogeneity concerns discussed above.

[15]We also re-estimate the model using reweighted least squares to minimize the effects of outliers. Economic freedom is always positive and significant while culture remains insignificant. Since there are no significant changes, we do not report the results to save space.

Table 3 Economic freedom, culture, and growth; Panel fixed effects regressions with lagged values

	Dependent var: growth rate		
	(1)	(2)	(3)
Culture	0.36	0.30	0.30
	(0.22)	(0.20)	(0.20)
Econ freedom	0.42[*]	0.40[*]	0.38
(1 pd. Lag)	(0.21)	(0.23)	(0.26)
Invest/GDP		0.16	0.16[*]
		(0.10)	(0.09)
Pop. growth		−1.09	−0.73
		(0.71)	(0.72)
Urban pop. %			0.12
			(0.11)
Area (log)			287
			(414)
Initial gdppc (log)	−2.59[***]	−3.60[***]	−4.72[***]
	(0.61)	0.79)	(1.32)
Constant	22.82[***]	30.62[***]	−3,681
	(4.97)	(6.36)	(5,347)
Observations	168	168	166
Number of countries	69	69	67
Adj. R-squared	0.08	0.14	0.16

Note: Robust and clustered standard errors are in parentheses. Significance level: [***] at 1%, [**] at 5%, [*] at 10%

This methodology is common in the economic freedom literature (for example, see Gwartney et al. 1999; Dawson 2003). We do recognize the possibility of using instrumental variable analysis, but choose not to pursue this strategy, as it is often difficult to find two valid instruments that satisfy all the necessary criteria and do not provide inconsistent results (for example, see Bound et al. 1995). We acknowledge that our robustness checks are imperfect and do not necessarily imply that we are capturing the causal relationships between freedom, culture, and growth; however, we view it as lending support to the main hypothesis.

We begin by re-estimating our main regressions, replacing economic freedom with its one-period lag. This implies that the average of economic freedom from 1970 to 1974 is now matched with growth from the second period, the average from 1975 to 1979, and so on. The results are reported below in Table 3.

As shown, lagged freedom exhibits a positive and significant relationship with growth in two out of three regressions. For example, in column (1), a one-unit increase in economic freedom increases growth by 0.42 percentage points in the following period and explains 8% of the variation. Freedom's coefficient is smaller than before, suggesting that our previous results possibly suffered from endogeneity biases. Culture is insignificant in all three regressions, consistent with our previous findings. These results support our claim above that

economic freedom is a primary determinant of economic growth and that culture's impact diminishes in the presence of strong economic institutions.

In order to provide a more 'direct' test for reverse causality, we provide a simple check where we utilize both lagged and future values of *changes* in freedom, changes in culture, and our growth rate. If reverse causality is driving our results, we expect that changes in income, i.e., the growth rate, will subsequently change freedom and, culture, or both; however, if freedom or culture is causing growth, then we expect changes in these variables to be associated with growth in the following period. Therefore, we analyze changes in these variables, as opposed to levels, for this specification only.

To test this proposition, the first four regressions keep growth as our dependent variable but use a one-period lag or one-period future value of either change in freedom or change in culture as the independent variables (only initial GDP pc is also included). Next, we use either change in freedom or change in culture as the dependent variable and the growth rate as the only independent variable.

If our main results suffer from reverse causality and economic growth causes more freedom or enhances cultural aspects directly, the future values of freedom and culture should be statistically significant when growth is the dependent variable. However, as shown in columns (2) and (4), this is not the case. These results suggest that growth is not correlated with changes in freedom or culture in the future. The evidence suggests that economic growth is not causing changes in freedom or culture. This claim is also supported by regressions (5) and (6), where either change in freedom or change in culture is the dependent variable, and the growth rate, lagged one period, is the only independent variable. In both regressions, economic growth is insignificant. Economic growth in the previous period exerted no effect on either freedom or culture in the following period. However, economic freedom in the previous period (the lagged value), as shown in regression (1), continues to support economic growth in the following period (a coefficient of 0.64 and a significance level at 1%), supporting our previous findings. The lagged change in culture is insignificant, also supporting our previous findings.[16]

5.2 Subcomponents of indices

Although our focus throughout the analysis is on both the overall freedom index and culture index, we estimate our main fixed effects regression specification (controlling for initial GDP) with subcomponents from both indices. We do so to address possible measurement error concerns and to further understand how different aspects of culture and economic freedom may affect growth (for example, see Carlsson and Lundström 2002; Tabellini 2009). The results are not reported but are summarized below.

We first estimate the effects of trust, respect, self-control, and obedience independently, with and without economic freedom. When economic freedom is not included in the specification, respect and self-control are positively and significantly related to growth, while trust and obedience are insignificant. Once we control for economic freedom, only self-control is positive and significant. Next, we include all four measures of culture, with and without economic freedom, and find that only self-control is positive and significant (in both regressions). Lastly, we include only trust and respect in the regression and find that respect is positive and significant when economic freedom is not included; however, respect

---

[16]We also ran these regressions without controlling for initial GDP per capita and found no significant changes.

Table 4 Economic freedom, culture, and growth; Panel fixed effects regressions with lagged and future values

	Dep. var: growth rate				Dep. var: change freedom	Dep. var: change culture
	(1)	(2)	(3)	(4)	(5)	(6)
Change econ freedom	0.638***					
(1 pd. Lag)	(0.237)					
Change econ freedom		−0.015				
(1 pd. Forward)		(0.211)				
Change culture			0.031			
(1 pd. Lag)			(0.029)			
Change culture				−0.003		
(1 pd. Forward)				(0.014)		
Growth					−0.003	0.787
(1 pd. Lag)					(0.012)	(1.114)
Initial gdppc	−3.131***	−4.025***	−0.917	−1.971*	0.200	−25.865*
(log)	(0.756)	(0.727)	(3.261)	(1.094)	(0.159)	(15.053)
Constant	30.421***	38.021***	11.930	20.350**	−1.508	235.466*
	(6.555)	(6.232)	(29.987)	(9.908)	(1.371)	(136.660)
Observations	437	551	81	99	553	107
Number of countries	111	120	50	53	121	56
Adj. R-squared	0.09	0.10	0.03	0.02	0.00	0.04

Note: Robust and clustered standard errors are in parentheses. Significance level: ***at 1%, **at 5%, *at 10%

loses significance once we control for economic freedom. Trust is insignificant in both. In all regression specifications, economic freedom is positive and significant, supporting our previous findings.

In addition to breaking down the culture index, we also separate the freedom index into its five main categories: size of government, access to sound money, legal structure and security of private ownership, freedom to trade internationally, and regulation of credit, business and labor. We first rerun the main fixed effects regression, controlling for initial income and one of the areas of freedom individually. When culture is not included in the regressions, all five areas are positive and significant, as expected. When culture is included, we find that area one, representing low levels of government spending, and area four, freedom to trade, as well as culture, positively and significantly impact growth. Area five (minimal regulation) also is positive and significant, but culture is insignificant. Areas two and three are insignificant along with culture. When all five are included simultaneously, areas three and four are positive and significant if culture is not included, and area five is significant

when culture is included. Culture remains insignificant. Although each component of the freedom index is not always significant, the basic result still holds.

5.3 Subsamples

As a final robustness check, we separate countries into two different groups based on the sample average scores of either the growth rate or economic freedom. We rerun the regression controlling for culture, economic freedom and initial income. The results are not reported but are summarized below. Our first subsample separates countries into high growth (above 3.5%) or low growth (below 3.5%) countries. For high growth countries, we find a similar result as before where economic freedom is positive and significant and culture is insignificant. However, in countries with higher growth rates, neither culture nor economic freedom is significant.

Our second subsample separates countries into free (freedom score above 5.8) or unfree (below 5.8) countries. For the unfree group, we again find a positive and significant impact from economic freedom and an insignificant effect from culture. In freer countries, an interesting result emerges. Culture and freedom are both positive and significant, suggesting that culture matters more for growth in relatively freer countries supporting the complementarity hypothesis. The results from the low growth sample and the group of unfree countries support the substitution hypothesis. Overall, these results suggest that culture and economic freedom may act as substitutes *or* complements, depending on a particular country's level of economic growth or freedom.

6 Conclusion

While both culture and economic freedom are recognized as potentially important for economic growth, a comprehensive empirical study examining the relative effects of both is absent from the literature. Our paper is one attempt to fill this gap, providing an answer to the substitute-complement query.

Our results indicate that economic freedom is relatively more important for growth than culture, though we do not dismiss the effects of culture on growth. Culture is significant in several specifications, but has a smaller effect than that of economic freedom. The significance of the culture variable disappears in the majority of regressions including economic freedom, suggesting that culture and economic freedom may be best described as substitutes. One possible explanation for this finding is that when private property rights and contracts are not formally enforced, individuals rely on informal norms, such as trust and respect, to substitute for this function. Once economic institutions exist that formally provide these functions, culture becomes less important and may not display such a strong effect in the growth regression.

Culture may also affect economic growth through indirect channels, such as promoting the establishment of economic freedom. Future research could explore the interaction and feedback between culture and freedom, providing new insights into the determinants of economic growth and how formal and informal institutions support a prosperous society.

Appendix 1

Variable	Data description	Data source
GDP growth	Growth of GDP per capita, PPP basis, constant 2000 international dollars.	World Development Indicators (2006)
Economic freedom	Economic freedom of the World is compiled by the Fraser Institute and measures the level of economic freedom on a scale from zero to ten, with ten representing a greater degree of freedom. The index utilizes 21 components grouped in seven broad categories: size of government, economic structure and use of markets, monetary policy and price stability, freedom to use alternative currencies, legal structure and security of security of private ownership, freedom to trade with foreigners, and freedom of exchange in capital markets. The index is available from 1970 onwards, based on 5 year intervals from 1970 to 2000; after 2000 it is reported on an annual basis.	Fraser Institute, *Economic Freedom on the World*
Culture	The sum of three positive beliefs (control, respect, trust) minus the negative belief (obedience). Trust is measured as the percentage of respondents who answered that "Most people can be trusted," respect is measured as the percentage of respondents that mentioned the quality "tolerance and respect for other people" as being important, control is measured as the unconditional average response (multiplied by 10) to the question asking to indicate how much freedom of choice and control in your life you have over the way your life turns out (scaled from 1 to 10), obedience is the percentage of respondents that mentioned obedience as being important. PCA culture is constructed by using principle component analysis to extract the common variation among all four components. Both indices are normalized to range between 0 and 10.	European and World Values Surveys, 1981–2007
GDP pc (log)	Real GDP per capita in 2000 constant dollars, log form.	Penn World Tables version 6.2
Investment share of GDP	Ratio of total investment to GDP in 2000 constant dollars.	Penn World Tables version 6.2
Log area	Logarithm of total area of a country.	World Development Indicators (2006)
Population growth	Growth rate of population.	World Development Indicators (2006)
Urban population	Percentage of population living in an urban area.	World Development Indicators (2006)
Primary school enrollment	Total number of pupils enrolled in primary school.	World Development Indicators (2006)
Geography	Measured as the absolute value of the latitude of the country, scaled to values between 0 and 1 (0 is the equator)	La Porta et al. (1999)
Legal origin	Dummy variables representing English or French legal origins.	La Porta et al. (1999)

Appendix 2: Summary and rank of data—average 1970–2004

Country	Culture		Growth		Economic freedom			
	Index	Rank	Rate	Rank	Index	Rank	Change	Rank
Albania	2.89	73	2.44	103	4.97	95	1.09	10
Algeria	1.59	86	4.16	45	4.00	127	0.17	64
Andorra	5.25	23						
Argentina	4.65	36	2.41	105	4.90	97	0.20	59
Armenia	4.15	50	0.33	131	6.46	30		
Australia	7.16	9	3.53	66	7.37	9	0.10	84
Austria	6.50	15	2.97	85	6.83	20	0.19	61
Azerbaijan	3.72	57	−1.13	137	5.65	70		
Bahamas, The			3.18	80	6.51	25	0.00	105
Bahrain			3.81	54	7.11	15	−0.05	117
Bangladesh	4.81	29	3.39	72	4.47	118	0.47	23
Barbados			3.00	83	6.31	34	0.05	98
Belarus	4.19	49	0.78	129				
Belgium	4.74	31	2.70	97	7.31	10	−0.05	118
Belize			5.98	16	5.67	68	0.20	60
Benin			3.49	68	5.30	81	0.09	88
Bolivia			2.47	102	5.27	84	0.50	21
Bosnia and Herzegovina	3.36	67	19.47	1				
Botswana			9.90	4	6.19	38	0.42	27
Brazil	2.26	78	4.48	35	4.68	112	0.09	87
Bulgaria	4.25	45	1.29	124	4.89	98	0.22	52
Burkina Faso	0.92	89	3.68	60				
Burundi			2.69	98	4.55	114	0.11	79
Cameroon			3.66	61	5.53	76	0.11	81
Canada	7.56	8	3.42	71	7.73	6	0.01	104
Central African Republic			1.34	123	4.47	119	0.30	38
Chad			3.23	78	4.84	102	0.28	40
Chile	3.67	59	4.34	38	5.94	54	0.57	19
China	8.04	6	8.80	5	5.28	83	0.39	30
Colombia	3.65	60	4.02	51	5.15	91	0.01	103
Congo, Dem. Rep.			−0.18	133	3.72	130	−0.02	110
Congo, Rep.			4.38	37	4.52	115	−0.01	106
Costa Rica			4.84	29	6.27	36	0.20	58
Cote d'Ivoire			3.26	76	5.66	69	0.11	80
Croatia	5.08	26	−0.13	132	5.19	89	1.81	3
Cyprus	3.38	66	6.32	14	6.02	53	0.21	55
Czech Republic	5.49	21	0.85	128	6.30	35	0.98	11
Denmark	9.02	2	2.17	110	7.00	17	0.09	85

Country	Culture		Growth		Economic freedom			
	Index	Rank	Rate	Rank	Index	Rank	Change	Rank
Dominican Republic	4.20	48	4.99	27	5.42	78	0.21	56
Ecuador			3.84	53	5.08	93	0.27	45
Egypt, Arab Rep.	2.68	74	5.18	22	5.19	88	0.44	25
El Salvador	2.28	77	2.57	100	5.61	73	0.64	16
Estonia	4.59	37	1.81	116	6.58	24	2.06	1
Ethiopia	2.58	75	3.13	82				
Fiji			3.43	70	5.78	61	0.13	73
Finland	8.71	3	3.15	81	7.13	14	0.09	86
France	4.27	44	2.95	86	6.47	29	0.06	94
Gabon			4.53	34	4.69	110	0.35	34
Georgia	3.87	54	1.35	122	6.16	39		
Germany	6.63	14	2.22	108	7.48	8	−0.04	115
Ghana	0.77	90	2.68	99	4.42	120	0.49	22
Greece	5.22	24	3.50	67	6.08	46	0.08	89
Guatemala			3.74	57	6.07	47	0.06	97
Guinea-Bissau			2.43	104	3.93	128	0.79	13
Guyana			1.69	119	5.27	85	1.18	8
Haiti			0.76	130	6.07	48	−0.12	119
Honduras			3.93	52	6.06	49	0.15	68
Hong Kong, China	5.71	18	6.60	12	8.97	1	−0.04	113
Hungary	4.01	52	2.90	88	5.74	65	0.63	17
Iceland	6.87	11	3.70	59	6.32	32	0.19	62
India	3.17	71	4.73	30	5.28	82	0.16	66
Indonesia	5.11	25	5.95	17	5.77	63	0.15	67
Iran, Islamic Rep.	4.76	30	2.74	95	4.99	94	0.03	101
Iraq	3.63	61	13.55	2				
Ireland	5.35	22	5.06	25	7.25	12	0.14	71
Israel			5.08	23	4.86	99	0.29	39
Italy	4.83	28	2.83	92	6.05	50	0.14	70
Jamaica			1.82	114	5.67	67	0.70	15
Japan	6.76	12	4.15	46	7.02	16	0.06	96
Jordan	4.38	42	6.40	13	5.87	57	0.32	36
Kenya			4.62	31	5.15	90	0.26	47
Korea, Rep.	5.78	17	7.48	7	5.92	55	0.25	51
Kuwait			4.44	36	6.12	43	0.46	24
Kyrgyz Republic	3.83	55	1.14	125				
Latvia	4.65	35	3.18	79	5.85	58	1.89	2
Lithuania	4.65	34	−0.81	135	5.72	66	1.66	4
Luxembourg	5.60	20	4.06	50	7.82	5	−0.01	107
Macedonia, FYR	4.11	51	−0.78	134	5.77	64		
Madagascar			1.64	120	4.74	105	0.37	33
Malawi			4.29	41	4.90	96	0.07	93

Country	Culture		Growth		Economic freedom			
	Index	Rank	Rate	Rank	Index	Rank	Change	Rank
Malaysia	4.25	46	6.67	10	6.93	19	−0.04	114
Mali	2.01	83	3.31	75	5.27	86	0.11	82
Malta	3.18	70	6.20	15	6.03	52	0.28	42
Mauritius			5.32	20	6.15	41	0.39	29
Mexico	4.25	47	4.14	47	5.89	56	−0.02	109
Moldova	3.82	56	−1.23	138				
Mongolia			4.08	49	6.32	33		
Morocco	2.14	80	4.22	44	5.24	87	0.06	95
Mozambique			3.71	58	5.42	79		
Myanmar			4.96	28	4.50	116	−0.31	122
Namibia			2.92	87	6.21	37	0.55	20
Nepal			3.57	65	5.32	80	−0.05	116
Netherlands	7.13	10	2.88	89	7.50	7	0.03	102
New Zealand	8.50	4	2.50	101	7.22	13	0.25	49
Nicaragua			1.77	117	4.24	124	0.62	18
Niger			1.43	121	4.58	113	−0.01	108
Nigeria	2.24	79	3.58	62	4.09	126	0.30	37
Norway	8.09	5	3.57	64	6.67	23	0.13	74
Oman			10.15	3	6.68	22	0.14	71
Pakistan	2.45	76	5.29	21	4.86	100	0.18	63
Panama			4.22	43	6.51	26	0.08	91
Papua New Guinea			3.37	73	6.04	51	−0.13	120
Paraguay			4.29	40	5.81	60	0.12	76
Peru	2.06	82	2.83	91	4.77	103	0.38	32
Philippines	2.11	81	3.80	55	5.85	59	0.15	68
Poland	2.94	72	3.34	74	4.86	101	0.75	14
Portugal	3.30	68	3.75	56	6.13	42	0.17	65
Puerto Rico	3.52	62	4.56	33				
Romania	4.56	38	0.86	127	4.69	109	0.28	44
Russian Federation	4.51	40	−0.98	136	4.71	107	1.24	5
Rwanda	0.00	92	4.30	39	3.84	129	−0.02	111
Saudi Arabia	4.51	39	5.40	18				
Senegal			2.75	94	5.12	92	0.26	46
Serbia and Montenegro	3.20	69	2.78	93				
Sierra Leone			0.98	126	4.71	108	−0.03	112
Singapore	3.44	65	8.19	6	8.21	2	0.07	92
Slovak Republic	3.97	53	1.72	118	6.10	44	1.13	9
Slovenia	4.50	41	2.03	111	5.57	74	1.22	6
South Africa	3.49	63	2.88	90	6.10	45	0.04	100
Spain	4.72	32	3.57	63	6.48	28	0.12	78
Sri Lanka			4.59	32	5.62	72	0.20	57
Sweden	10.00	1	2.36	107	6.49	27	0.25	50
Switzerland	7.95	7	1.82	115	8.14	3	0.04	99

Table 4 (*Continued*)

Country	Culture		Growth		Economic freedom			
	Index	Rank	Rate	Rank	Index	Rank	Change	Rank
Syrian Arab Republic			5.34	19	4.32	122	0.13	75
Taiwan	4.35	43			6.98	18	0.08	90
Tanzania			4.11	48	4.39	121	0.34	35
Thailand	4.70	33	6.72	9	6.43	31	0.12	77
Togo			3.49	69	4.73	106	0.22	54
Trinidad and Tobago	1.81	85	2.71	96	5.78	62	0.44	26
Tunisia			5.06	26	5.53	75	0.22	53
Turkey	2.01	84	4.24	42	4.76	104	0.28	41
Uganda	0.59	91	5.06	24	4.12	125	0.83	12
Ukraine	3.44	64	−1.55	139	4.49	117	1.18	7
United Arab Emirates			6.82	8	6.82	21	0.38	31
United Kingdom	5.65	19	2.39	106	7.25	11	0.28	43
United States	6.75	13	3.25	77	8.06	4	0.10	83
Uruguay	4.90	27	1.84	113	6.15	40	0.25	48
Venezuela, RB	3.71	58	2.19	109	5.62	71	−0.35	123
Vietnam	5.84	16	6.63	11	5.49	77		
Zambia	1.41	87	1.89	112	4.68	111	0.41	28
Zimbabwe	1.27	88	2.98	84	4.25	123	−0.26	121

Appendix 3: Summary statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Growth	686	3.54	3.11	−11.48	21.21
GDP pc	624	9,063.55	8,775.49	488.16	59,880.20
Initial gdppc (log)	692	8.59	1.09	5.88	10.78
Culture	228	4.82	1.82	0.00	10.00
Econ freedom	700	5.82	1.27	2.10	9.23
Invest/GDP	693	16.13	8.44	2.21	50.97
Pop. Growth	693	1.70	1.51	−20.36	7.07
Urban pop. %	693	54.82	23.39	3.67	100.00
Area (log)	679	12.19	2.01	5.77	16.61
Primary school rate	70	0.54	0.25	0.06	0.97
Latitude	643	0.27	0.18	0.01	0.72
English legal origin	643	0.37	0.48	0.00	1.00
French legal origin	643	0.42	0.49	0.00	1.00

Appendix 4: Pairwise correlations

	Growth	Cult.	Econ free	Initial gdppc	Invest/GDP	Pop growth	Urb. pop	Area (log)	Prim. sch.	Geo.	English	French
Growth	1.00											
Culture	0.02	1.00										
Econ freedom	0.14	0.52	1.00									
Initial gdppc (log)	−0.08	0.59	0.68	1.00								
Invest/GDP	0.17	0.54	0.48	0.40	1.00							
Pop growth	0.18	−0.21	−0.28	−0.26	−0.17	1.00						
Urban pop %	−0.07	0.35	0.55	0.81	0.40	−0.19	1.00					
Area (log)	−0.01	0.07	−0.19	−0.15	0.04	0.11	−0.13	1.00				
Primary school rate	0.08	0.64	0.74	0.76	0.36	0.07	0.37	0.05	1.00			
Geography	0.04	−0.02	0.08	0.02	0.04	0.01	−0.02	0.01	−0.04	1.00		
English legal origin	0.00	−0.12	−0.02	0.00	−0.04	−0.05	0.05	0.02	−0.04	−0.28	1.00	
French legal origin	0.01	0.14	−0.02	0.00	0.02	0.03	−0.03	−0.03	0.01	−0.24	−0.63	1.00

Appendix 5: Principle component analysis

Correlations

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp. 1	1.40	0.12	0.35	0.35
Comp. 2	1.28	0.49	0.32	0.67
Comp. 3	0.79	0.25	0.20	0.87
Comp. 4	0.54		0.13	1.00

Eigenvectors

Variable	Comp. 1	Comp. 2	Comp. 3	Comp. 4	Unexplained
Trust	0.72	−0.08	0.18	0.66	0.00
Respect	0.25	0.65	0.62	−0.37	0.00
Self-control	0.33	0.55	−0.76	−0.09	0.00
Obedience	−0.56	0.52	0.06	0.65	0.00

References

Aghion, P., Algan, Y., Cahuc, P., & Shleifer, A. (2009). *Regulations and distrust. NBER Working Paper 14648*. National Bureau of Economic Research, Cambridge, MA.

Banfield, E. C. (1958). *The moral basis of a backward society*. New York: Free Press.

Barro, R. J. (2001). Education and economic growth. In J. F. Helliwell (Ed.), *The contribution of human and social capital to sustained economic growth and well-being*. International Symposium Report: OECD and HRDC.

Barro, R. J. (2002). Education as a determinant of economic growth. In E. P. Lazear (Ed.), *Education in the twenty-first century* (pp. 9–24). Stanford: Hoover Institution Press.

Barro, R. J., & McCleary, R. (2003). Religion and economic growth across countries. *American Sociological Review*, *68*(5), 760–781.

Bengoa, M., & Sanchez-Robles, B. (2003). Foreign direct investment, economic freedom and growth: new evidence from Latin America. *European Journal of Political Economy*, *19*, 529–545.

Benson, B. L. (1989a). Enforcement of private property rights in primitive societies: law without government. *The Journal of Libertarian Studies*, *9*(1), 1–26.

Benson, B. L. (1989b). The spontaneous evolution of commercial law. *Southern Economic Journal*, *55*(3), 644–661.

Berggren, N. (2003). The benefits of economic freedom: a survey. *The Independent Review*, *8*(2), 193–211.

Berggren, N., & Jordahl, H. (2005). Does free trade really reduce growth? further testing using the economic freedom index. *Public Choice*, *122*(1–2), 99–114.

Berggren, N., & Jordahl, H. (2006). Free to trust: economic freedom and social capital. *Kyklos*, *59*(2), 141–169.

Berggren, N., Elinder, M., & Jordahl, H. (2008). Trust and growth: a shaky relationship. *Empirical Economics*, *35*, 251–274.

Beugelsdijk, S., de Groot, H. L. F., & van Schaik, A. B. T. M. (2004). Trust and economic growth: a robustness analysis. *Oxford Economic Papers*, *56*, 118–134.

Bjørnskov, C. (2007). Economic growth: a social capital survey. In G. Svendsen, & G. Svendsen (Eds.), *Handbook of Social Capital*. Cheltenham: Edward Elgar.

Bjørnskov, C. (2009). How does social trust affect economic growth? *Aarhus Economics Working Paper*, No. 06-2.

Bjørnskov, C. (2010). How does social trust lead to better governance? An attempt to separate electoral and bureaucratic mechanisms. *Public Choice*, *144*(1–2), 323–346.

Boettke, P. J. (2009). Review of Eric L. Jones cultures merging: a historical and economic critique of culture. *Economic Development and Cultural Change*, *57*(2), 434–437.

Boettke, P., Coyne, C. J., & Leeson, P. T. (2008). Institutional Stickiness and the New Development Economics. *American Journal of Economics and Sociology*, *67*(2), 331–358.

Bound, J., Jaeger, D. A., & Baker, R. M. (1995). Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak. *Journal of the American Statistical Association*, *90*(430), 443–450.

Carlsson, F., & Lundström, S. (2002). Economic freedom and growth: decomposing the effects. *Public Choice*, *112*, 335–344.

Chamlee-Wright, E. (1997). *The cultural foundations of economic development: urban female entrepreneurship in Ghana*. New York: Routledge.

Dawson, J. W. (1998). Institutions, investment, and growth: new cross-country and panel data evidence. *Economic Inquiry*, *36*, 603–619.

Dawson, J. W. (2003). Causality in the freedom-growth relationship. *European Journal of Political Economy*, *19*(3), 479–495.

De Haan, J., Lundström, S., & Sturm, J. (2006). Market-oriented institutions and policies and economic growth: a critical survey. *Journal of Economic Surveys*, *20*(2), 157–191.

De Haan, J., & Sturm, J. (2000). On the relationship between economic freedom and economic growth. *European Journal of Political Economy*, *16*, 215–241.

Diamond, J. (1997). *Guns, germs, and steel*. New York: Norton.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2003). Courts. *Quarterly Journal of Economics*, *118*(2), 453–517.

Duffy, D., & Stubben, J. (1998). An assessment of native American economic development: putting culture and sovereignty back in the models. *Studies in Comparative International Development*, *32*(4), 52–78.

Francois, P., & Zabojnik, J. (2005). Trust, social capital and economic development. *Journal of European Economic Association*, *3*(1), 51–94.

Fukuyama, F. (1996). *Trust: the social virtues and the creation of prosperity*. New York: Simon and Schuster.

Gallup, J., Sachs, J., & Mellinger, A. (1999). Geography and economic development. *International Region Science Review*, *22*(2), 179–232.

Glaeser, E. L., La Porta, R., Lopeez-De-Silanes, F., & Shleifer, A. (2004). Do institutions cause growth? *Journal of Economic Growth*, *9*, 271–303.

Greif, A. (1993). Contract enforceability and economic institutions in early trade: the Maghribi traders' coalition. *The American Economic Review*, *83*(3), 525–548.

Greif, A. (1994). Cultural beliefs and the organization of society: A historical and theoretical reflection on collectivist and individualist societies. *Journal of Political Economy*, *102*(5), 912–950.

Greif, A., Milgrom, P., & Weingast, B. R. (1994). Coordination, commitment, and enforcement: the case of the merchant guild. *The Journal of Political Economy*, *102*(4), 745–776.

Grier, R. (1997). The effect of religion on economic development: a cross-national study of sixty-three former colonies. *Kyklos*, *50*(1), 47–62.

Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic Perspectives*, *20*(2), 23–48.

Gwartney, J. D., Lawson, R. A., & Block, W. (1996). *Economic freedom of the world: 1975–1995*. Vancouver: The Fraser Institute.

Gwartney, J. D., Lawson, R. A., & Holcombe, R. G. (1999). Economic freedom and the environment for economic growth. *Journal of Institutional and Theoretical Economics*, *155*, 643–663.

Gwartney, J. D., Holcombe, R. A., & Lawson, R. G. (2004). Economic freedom, institutional quality, and cross-country differences in income and growth. *Cato Journal*, *24*(3), 205–233.

Gwartney, J. D., Lawson, R. A., & Norton, S. (2008). *Economic freedom of the world: 2008 annual report*. Vancouver, BC: The Fraser Institute. Data retrieved from www.freetheworld.com.

Harper, D. A. (2003). *Foundations of entrepreneurship and economic development*. New York: Routledge.

Heinemann, F., & Tanz, B. (2008). The impact of trust on reforms. *Journal of Economic Policy Reform*, *11*, 173–185.

Heston, A., Summers, R., & Aten, B. (2006). *Penn world table version 6.2*. Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania.

Knack, S., & Keefer, P. (1995). Institutions and economic performance: cross country tests using alternative institutional measures. *Economics and Politics*, *7*(3), 207–228.

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? *The Quarterly Journal of Economics*, *112*(4), 1251–1288.

Landa, J. T. (1994). *Trust, ethnicity, and identity: The new institutional economics of ethnic trading networks, contract law, and gift-exchange*. Ann Arbor: University of Michigan Press.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1997). Trust in large Organizations. *American Economic Review*, *87*(2), 333–338.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1999). The quality of government. *Journal of Law, Economics and Organization*, *15*(1), 222–279.

La Porta, R., Lopez-de-Silanes, F., Pop-Eleches, C., & Shleifer, A. (2004). Judicial checks and Balances. *Journal of Political Economy*, *112*(2), 445–470.

Leeson, P. T. (2007a). Better off stateless: Somalia before and after government collapse. *Journal of Comparative Economics*, *35*(4), 689–710.

Leeson, P. T. (2007b). Trading with bandits. *Journal of Law and Economics*, *50*(2), 303–321.

Leeson, P. T. (2007c). Efficient anarchy. *Public Choice*, *130*(1–2), 41–53.

Leeson, P. T. (2008). Social distance and self-enforcing exchange. *Journal of Legal Studies*, *37*(1), 161–188.

Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *American Economic Review*, *82*, 942–963.

Licht, A. N., Chanan, G., & Schwartz, S. H. (2007). Culture rules: the foundations of the rule of law and other norms of governance. *Journal of Comparative Economics*, *35*, 659–688.

Mankiw, N. G., Romer, D., & Weil, D. (1992). A contribution to the empirics of economic Growth. *The Quarterly Journal of Economics*, *107*, 407–437.

North, D. C. (1990). *Institutions, institutional change, and economic performance*. Massachusetts: Cambridge University Press.

North, D. C. (2005). *Understanding the process of economic change*. New Jersey: Princeton University Press.

Ostrom, E. (1990). *Governing the commons: the evolution of institutions for collective action*. New York: Cambridge University Press.

Patterson, O. (2000). Taking culture seriously: a framework and an afro-American illustration. In L. Harrison, & S. Huntington (Eds.), *Culture matters: how values shape human progress* (pp. 202–218). New York: Basic Books.

Pejovich, S. (2003). Understanding the transaction costs of transition: it's the culture, stupid. *The Review of Austrian Economics*, *16*(4), 347–361.

Platteau, J. (2000). *Institutions, social norms, and economic development*. Harwood: Academic Publishers/Routledge.

Porter, M. E. (2000). Attitudes, values, and beliefs, and the microeconomics of prosperity. In L. Harrison, & S. Huntington (Eds.), *Culture matters: how values shape human progress* (pp. 202–218). New York: Basic Books.

Putnam, R. D. (1993). *Making democracy work: civic traditions in modern Italy*. Princeton: Princeton University Press.

Sachs, J. (2001). *Tropical underdevelopment*. National Bureau of Economic Research Working Paper No. 8119.

Sachs, J. (2003). *Institutions don't rule: direct effects of geography on per capita income*. National Bureau of Economic Research Working Paper No. 9490.

Tabellini, G. (2008). Presidential address: institutions and culture. *Journal of the European Economic Association*, *6*(2–3), 255–294.

Tabellini, G. (2008b). The scope of cooperation: values and incentives. *The Quarterly Journal of Economics*, *123*(3), 905–950.

Tabellini, G. (2009). Culture and institutions: economic development in the regions of Europe. *Journal of the European Economic Association* (forthcoming).

The European Values Study Foundation and World Values Survey Association (EVSF-WVSA) (2006). European and World Values Surveys Four-Wave Integrated Data File, 1981–2004, v.20060423.

Weede, E., & Kämpf, S. (2002). The impact of intelligence and institutional improvements on economic growth. *Kyklos*, *55*, 361–380.

Weede, E. (2006). Economic freedom and development: new calculations and interpretations. *Cato Journal*, *26*(3), 511–524.

Williamson, C. R. (2009). Informal institutions rule: institutional arrangements and economic performance. *Public Choice*, *139*(3), 371–387.

Williamson, C. R., & Kerekes, C. B. (2009). Securing private property: formal versus informal institutions. Mimeo.

Woolcock, M. (1998). Social capital and economic development: toward a theoretical synthesis and policy framework. *Theory and Society*, *27*(2), 151–208.

World Bank (2006). *World development indicators*. Washington: World Bank.

Zak, P. J., & Knack, S. (2001). Trust and growth. *The Economic Journal*, *111*, 295–321.