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The Interaction of Individual Values and Sticky Formal Institutions in Economic Development*

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Abstract

This paper intends to take a step towards improving our understanding of how culture affects economic development. Relying on the theory of institutional stickiness (Boettke et al. 2008), the main hypothesis is that the "deep" cultural layer (proxied by individual values) interacts with the stickiest formal institutions in development, which leads to a very special "stuck-together" phenomenon. The aim of the paper is to investigate this specific effect empirically, and show the genuinely unique role of individual values in development. The cross-country empirical analyses provide details as regards the "stuck-togetherness" of values and institutions. Besides establishing that both values and sticky formal institutions are strong determinants of long-run income, I find that the "stuck-togetherness" of values and institutions acts as a separate factor in development, and, in addition, amplifies the impact of values on development in the good-institution countries. Another result is that better formal institutions increase the marginal income-increasing effect of those individual values that are favorable to development. The results seem to be very robust.

JEL Codes: E02, O43

Keywords: culture, individual values, institutions, economic development, institutional stickiness

1. Introduction

Although Adam Smith (1759) was the first to analyze how norms, beliefs, morality and culture affect economic development, an upsurge of interest in the role of culture has occurred only recently.[1] Nowadays, the majority of research on the impact of culture is empirical, and up to the present time a relatively large and widespread literature has developed (e.g., Putnam et al. 1993, Knack and Keefer 1997, Zak and Knack 2001, Tabellini 2010, Williamson 2009, Gorodnichenko and Roland 2011).

While the insight that culture *matters* in economic performance is commonly shared by the scholars in the field, views and arguments differ when it comes to the details: how culture matters, directly or indirectly; which particular component of culture matters; through which channels culture matters; what the causal mechanisms are; etc. If the findings of the literature concerning these details are in some sense inconclusive, and indeed they are, it is because the empirical literature is "struggling" with

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[1] Probably the most prominent contribution to the field which is not recent – besides Adam Smith's book –, is the influential work by Max Weber (1930). Weber used religiosity to express culture and argued that Protestantism played a crucial role in the development of capitalism.

theoretical/definitional problems (e.g., Guiso et al. 2006, Tabellini 2010): the empirical literature on culture is "trying to do empirical research on a fragile conceptual base" (Moore 1999:75), accordingly, what the econometrics of culture shows is that there is an impact of *something* on economic performance, but we do not know what it is exactly (Herrmann-Pillath 2014).

To progress further in "culture-development" research, some prominent scholars in the field suggest stepping back from "grandiose approaches", and focusing instead on an analysis of the impact of a very specific aspect or dimension of culture[2] (Durlauf and Fafchamps 2005); and relying primarily on theoretically-derived hypotheses (Manski 2000).

This paper intends to follow the route proposed above: based on the theory of institutional stickiness (Boettke et al. 2008). On the one hand, I will unbundle culture and focus on the development-enhancing impact of only one cultural layer (the "deep" one), and on the other, I will derive theory-driven hypotheses for my empirical analyses.

When it comes to unbundling culture, my argument is that this can be based on the degree of stickiness of the different cultural layers (dimensions), similarly to the way in which different institutions are categorized on the basis of their degree of stickiness in Boettke et al. (2008). Then, my focus will be on the "deep" cultural layer to which other cultural layers and the formal institutions are stuck, which will be proxied by exogenous *individual values*. For my concern, the main implication of the theory of institutional stickiness is that the "deep" cultural values are embodied and crystallized in the stickiest formal institutions of a society, leading to a special interaction phenomenon ("stuck-togetherness"). The aim of this paper is to investigate this specific effect empirically, and evidence the genuinely unique role of the "deep" cultural layer in economic development.

My cross-country regression results have provided details as regards the "stuck-togetherness" of values and sticky formal institutions. More specifically, besides establishing that both values and sticky formal institutions are strong determinants of long-run income, I have found that their "stuck-togetherness" acts as a separate factor in development, and in addition, it amplifies the impact of values on development in the good-institution countries. Furthermore, I have evidenced that better formal institutions

[2] Among others, Klasing (2013) and Tambovtsev (2015) argue that culture has several dimensions.

increase the marginal income-increasing effect of those individual values that are favorable to development. Both findings suggest that there is a strong complementary effect between individual values and sticky institutions in economic development. My findings are very robust for various robustness checks.

The paper is organized as follows. In section 2 I will give a short review of the empirical literature on the impact of culture on development. In section 3 I will set out my main hypotheses, and the model, and will present the data. Section 4 will discuss the baseline results of the empirical investigations, while section 5 will provide robustness checks. Section 6 will conclude.

2. Review of the literature: how culture affects economic performance

The quantitative analyses on the impact of culture that have developed up to the present time are diverse in terms of the measure of culture, the empirical strategy, and the samples of countries or regions used in the studies. Because of the focus of my concern, in this review I will briefly summarize only those studies that are interested in analyzing the impact of culture on long-run development, i.e., those in which the dependent variable is a measure of economic performance.

Undoubtedly, the early "reference studies" are Hofstede (1980), Putnam et al. (1993), and Inglehart (1990), all documenting that cultural differences are the primary source for growth/income differences across countries. "The opening through which culture entered the economic discourse was the concept of trust" (Guiso et al 2006:29).[3] In the literature trust has been seen as the most important dimension of social capital (e.g., Fukuyama 1995). The first study to investigate the economic effect of social capital, which "has opened a Pandora's box of research" (Casey 2004:96), was Putnam et al. (1993). In their book Putnam et al. (1993) analyze Italian regions and argue that the critical factor in explaining differences in the economic performance of various Italian regions can be found in regional differences in social capital: in regions with a horizontal

[3] Note that outside economics, political scientists have been analyzing the effects of culture on growth, too. Jackman and Miller (1996) for instance explore the idea that the relationship between political culture and growth is very weak, if not inexistent, a conclusion that challenges Inglehart's (1990) findings. Granato et al. (1996) can be considered an important improvement on Jackman and Miller (1996), leading to quite different results: their measures of culture are significant predictors of economic growth, together with the traditional economic factors. Edwards and Patterson (2009) extend the analysis of Granato et al. (1996) in several ways, but their results show that the links between culture and growth are not as clear as was found by Granato et al. (1996). Swank (1996) is another study to highlight and refine the results of Granato et al. (1996).

social structure, based on trust, social capital is higher, and economic outcomes are greater.

This work has been followed up by numerous analyses, of which Knack and Keefer (1997) is the most influential. The two scholars associate social capital with *interpersonal trust* and *civic cooperation*. To measure them, they take data from the World Values Survey. In their cross-country regression Knack and Keefer (1997) find that both cultural variables significantly affect economic growth. More importantly, when including an interaction term of trust and GDP per capita in the regression besides trust and civic cooperation, they provide evidence that both trust and civic cooperation are stronger in countries with higher and more equal incomes, with institutions that restrain the predatory actions of chief executives, and with better-educated and ethnically homogeneous populations.

Zak and Knack (2001), in some respects, is an extension of Knack and Keefer (1997), by confirming its main findings, but at the same time, providing new insights, as well: they prove the existence of the low-trust poverty trap. Another interesting result is that they are able to identify trust as a channel, and not only a factor on its own to induce growth.

A few studies have examined whether social capital is a prerequisite for prosperity at the sub-national level. Schneider et al. (2000) is one example. This paper analyzes how political culture and social capital affects growth on a wider sample of the regions of Europe. As opposed to Putnam et al.'s (1993) results, these authors argue that the impact of culture on economic growth is marginal, at best.

Beugelsdijk and Van Schaik (2005a) is another paper looking at regional differences in Europe in the field of social capital-development. In their empirical investigations they come to a very similar conclusion to that drawn by many others: social capital is positively and significantly related to regional economic growth. With the intention of answering the question of whether the findings of Putnam et al. (1993) on Italian regions can be generalized, the two authors refine their investigations in another paper (Beugelsdijk and Van Schaik 2005b). In this study they renew the regression analysis, by modifying the specification, but more importantly, by providing an extensive set of robustness checks. The main finding is that *trust* is not a significant

determinant of regional growth, but another dimension of social capital, namely *active group membership* is, a result that partly confirms Putnam et al.'s (1993) hypothesis.

Akçomak and ter Weel (2009) focus on the indirect effects of social capital on economic growth. As a channel, this paper identifies innovation. The authors apply 3SLS strategy, and throughout the empirical investigation, *trust* is instrumented by historical institutions. For 102 regions in Europe, this paper provides evidence for the fact that innovation has a strong positive impact on growth, the former being significantly affected by social capital, but social capital does not have a significant effect on growth.

The only paper discovering a negative relationship between trust and growth is Roth (2009).[4] This paper uses panel data, and reveals that when excluding transition countries from the sample, the relationship becomes curvilinear, meaning that in low-trust countries an increase in trust leads to higher growth, but in high-trust countries an increase in trust leads to a decrease in growth. But, interestingly, when analyzing the relationship in a cross section of countries, the positive association of trust with growth detected my many, appears.

The research question of Ahlerup et al. (2009) is unique because the authors' primary interest lies in understanding whether social capital substitutes or complements institutions in growth. The results obtained from a standard cross-country Barro-type growth regression provide evidence that trust and formal institutions substitute each other in growth. In the interpretation of the authors this indicates that the marginal effect of social capital decreases with better institutions: trust matters the most when formal institutions are weak. On the other hand, the marginal effect of an improvement in institutions depends on the level of trust.

The basic econometric difficulties with the social capital (trust) literature, including robustness (sensitivity) has been illustrated by many (e.g., Durlauf 2002, Durlauf and Fafchamps 2005, Beugelsdijk et al. 2004, Beugelsdijk 2006). For instance the paper by Beugelsdijk et al. (2004) explicitly and extensively analyzes the robustness of the results of two seminal papers, namely Zak and Knack (2001), and Knack and Keefer (1997). The results reveal that Zak and Knack's (2001) results are very robust,

[4] According to the author, the theoretical underpinning for a possible negative relationship between trust and growth is the collective action theory of Olson (1982).

which is not the case for Knack and Keefer (1997). Berggren et al. (2007) also provides an extensive robustness analysis concerning, in general, the link between trust and growth, and discovers that this relationship is less robust than claimed by earlier studies.

Tabellini (2008, 2010) opens up a new branch in the analysis of the impact of culture on development by introducing and pioneering the use of a composite measure based on answers to four WVS questions, diverging in this way from the social capital concept. The variables he focuses on are *trust*, *respect*, *individual self-control*, and *obedience*.

In his 2010 paper (Tabellini 2010) he shows that the aggregate variable constructed from the four introduced above significantly correlates with current development in different regions of Europe, after controlling for country fixed effects and for human capital. He also uses an IV estimation in which he uses past literacy and past political institutions as instruments. His finding is that the data do not reject the hypothesis that the effect of these two variables on regional output only operates through culture.

The four measures suggested by Tabellini are extensively used by Williamson in several empirical studies. In her 2009 paper (Williamson 2009) she investigates the relationship between formal and informal institutions (culture) and how the interaction between the two can impact development. Her results, in an important respect, are different from those of Tabellini because she identifies a dominant effect of informal institutions (culture): strong informal institutions are determinants of economic development regardless of the strength of the formal institutions.

More recently, she and her co-author (Williamson and Mathers 2011) show that culture, and the institutions of economic freedom are both independently important for economic growth. They find that when controlling for both culture and economic freedom simultaneously, the strong association between culture and growth becomes much weaker, suggesting that culture and economic freedom may act as substitutes. Mathers and Williamson (2011) is another paper which investigates how the interaction between culture and economic freedom affects economic prosperity. Here a new result is that the same institutions combined with different cultures have diverse outcomes.

Gorodnichenko and Roland (2010, 2011) analyze the effect of culture on output per capita by using data from the three main cultural databases (the WVS, the Hofstede database and the Schwartz Value Survey). In the 2011 paper they find that the

Hofstede's *individualism* index is always significant, whereas this is not the case for most cultural variables. In their more detailed analysis (Gorodnichenko and Roland 2010), they assume that culture plays a key role in stimulating innovations and hence explaining long-run economic growth. They hypothesize that culture is a basic force underlying formal institutions and long-run growth. They show empirically a strong causal effect from culture to long-run growth and the level of innovation; and that culture makes an important contribution to economic development which is independent of institutions. In terms of magnitudes, culture explains income differences across countries at least as much as institutions.

3. Hypotheses, the model and data

The above review clearly shows that every time scholars refer to culture, they simply reduce its meaning to a much narrower concept[5], such as social capital (e.g., Beugelsdijk and Van Schaik 2005a, Akçomak and ter Weel 2009), generalized trust (Zak and Knack 2001, Roth 2009) and others; and depending on which particular dimension of culture is used, the empirical results may be different. As suggested in the introduction, a possible fruitful way to progress further with an analysis of the development-enhancing effects of culture is to unbundle culture, and analyze the impact of each particular cultural dimension separately. An advantage of this procedure is that it allows us to focus on much more specific questions than the rather "grandiose" ones which feature in the current literature, something which can help overcome the inconclusive findings of the literature.

My argument is that the theory of institutional stickiness (Boettke et al. 2008) can provide us with theoretical reasoning as to how to unbundle culture: similarly to the way in which different institutions can be categorized on the basis of their degree of stickiness. Boettke et al. (2008) propose a new taxonomy of institutions based on their degree of stickiness. The core onto which formal institutions are stuck is the so called *metis*[6], which comprises unwritten (informal) norms, practices, beliefs, and conventions, i.e., informal institutions, and can be thought of as the glue that gives institutions their stickiness. The stickiest institutions, named indigenously introduced endogenous (IEN)

[5] Note that this criticism refers to those summarized in section 2; of course, many do not equate culture with social capital or trust (e.g., Landes 2000, Migheli 2017).

[6] *Metis* means 'wisdom' in the ancient Greek religion.

institutions, evolve informally over time and are grounded in the practices, customs, values, and beliefs of indigenous people. That is, they emerge endogenously and directly from the *metis* and are in harmony with local conditions, attitudes, and practices. In this sense IEN institutions are institutionalized *metis*. Examples of IEN institutions are the rule of law, commercial law, common law, the constitution, property rights, money, etc. The second group of institutions, namely indigenously introduced exogenous (IEX) institutions are indigenous, but exogenously introduced by a formal authority, such as the state. Since the formal authority lacks knowledge of the *metis*, it is very likely that incongruities between IEX institutions and the *metis* will emerge. IEX institutions include, for instance, state-made laws, state regulatory institutions, etc. Foreign-introduced exogenous (FEX) institutions are introduced by foreigners; accordingly, they tend to be the least sticky, since foreigners are less aware of the local norms and practices found in the *metis*.

While the authors have analyzed the three categories of institutions in detail, they fail to do this for the *metis*. But based on their short description, it can be thought of consisting of informal institutions (culture), within which, as I argue, we can distinguish various layers based on their degree of stickiness. Clearly, the *values* that are to a large extent exogenous to people, reflecting the most basic norms, judgments, and beliefs in relation to how to interact with and behave towards other people constitute the deepest cultural layer. Of course, other less sticky layers such as religiosity or trust can also be distinguished within culture, but the focus of the empirical analysis of this paper – conforming to the route I follow – will center only on one layer, the "deep" one.

The above institutional stickiness model allows me to derive theoretically-based hypotheses for empirical analysis as regards the impact of *values* on development. The theory suggests that in the long run the very sticky formal institutions (IEN institutions in terms of Boettke et al. 2008) should be in harmony with cultural values to which they are stuck, which is guaranteed by the process in which those formal institutions that are not stuck to cultural values cannot survive (see Boettke et al. 2008). This is because the deep cultural values are embodied and crystallized in the stickiest formal institutions of a society, which leads to a special "stuck-together" phenomenon. Due to this phenomenon, I expect that cultural values will exercise a very specific effect on long-run development: besides influencing development on their own, suggesting a strong

complementary effects between values and institutions on development, their being in harmony, i.e., "stuck-togetherness", with the sticky formal institutions may provoke an additional impact on long-run income. Furthermore, the theoretical framework also suggests that the marginal income-increasing effect of cultural values will depend on the quality of sticky institutions. These theoretical insights, however, must be aided by empirical research. Empirics is supposed to help me clarify what the "stuck-togetherness" of values and institutions implies in practice.

The key when testing the above hypotheses is to capture in some way, and include in the regression the "stuck-togetherness" of cultural values and sticky formal institutions in the developmental process. To express this phenomenon I will include an interaction term between values and the institutions. This term can capture the additional impact of values on income, which depends on the level of institutions. Since the main focus is on long-term development, I will be interested in explaining income levels rather than growth rates. The empirical analysis will consist of cross-country regression analysis[7] in which I will rely on the following model:

$$\ln(GDP\,pc)_i = const + \beta_1 values_i + \beta_2 \ln(institution)_i + \beta_3 (values \ln(institution))_i + \mathbf{X}\boldsymbol{\beta}_4 + \varepsilon_i$$

where the variable *values* is the measure of cultural values, the variable *institution* is the measure of a sticky formal institution, *values*ln(institution)* is the interaction term, while the vector *X* includes certain control variables (human capital, geography variable), and ε_i is the error term.

The dependent variable is log per capita GDP in 2010 from the Penn World Table (PWT) 7.1. As mentioned before, the rule of law can be considered among the best examples of the sticky formal (IEN) institutions, therefore as a proxy for the *institution* variable, I will use a widely used rule of law measure, namely the Area 2 sub-index[8] (in its chain-linked form, averaged from 1990 to 2010) of the Economic Freedom of the World Index (EFW) complied by the Fraser Institute (Gwartney et al. 2012).

[7] Since only the *institution* variable has a time dimension among the many independent variables, panel estimations will not be very meaningful in this case.

[8] The Area 2 sub-index is an aggregate measure of the following: judicial independence, impartial courts, protection of property rights, military interference in the rule of law and politics, integrity of the legal

Amongst control variables, to minimize the risk of endogeneity of education in the development process, as a measure for human capital I will use historical data, the primary enrollment ratio in 1920 from Benavot and Riddle (1988), and as a widely used geographical variable, the latitude of country centroid from Gallup et al. (1999)[9].

The main independent variable is *values* that I measure with data from the Schwartz Values Survey, which has been built since 1988 by Schwartz (Schwartz 1994, 1999, 2006), and, importantly, on theoretical foundations. The theory behind the database has been developed in cross-cultural psychology, and centers on individual values. For Schwartz (2006) individual values include the rich complex of meanings, beliefs, practices, symbols, norms, and values prevalent among people in a society. Schwartz sees them as the *core* of culture which are exogenous to individuals and do not change. The survey questions and the variables derived from them rely on *a priori* theorizing.[10] Of course, not all values in the Schwartz dataset are related to economic development. Simply based on Schwartz's theory we can determine the affecting values, but to provide a statistical ground for the selection of values I have regressed each of them on per capita GDP. As a result, I have been left with three significant values, namely *embeddedness*, *hierarchy*, and *mastery*.[11] To be able to include an interaction term in the regression, I have to have only one measure for *values*; that is why I will use the first principle component of these three values, whose eigenvalue is 2.566, and this is the only component with an eigenvalue greater than 1.[12] The correlations of the principal component with the three original measures are very high in each case (greater than 0.907). I do not take the logarithm of *values* since it has negative values as well.

Since data availability poses a constraint on the number of countries, 56 countries will be included in the cross-country regressions.

system, legal enforcement of contracts, regulatory restrictions on the sale of real property, reliability of the police, and the business costs of crime (Gwartney et al. 2012).

[9] The dataset is available at: http://www.cid.harvard.edu/ciddata/geographydata.htm

[10] The starting point for Schwartz (1994, 1999, 2006) is that all societies confront three basic issues when forming the social relations, and the answers to these questions are inherently different in different societies. For a description of these issues see Schwartz (2006). Based on these, he identifies seven value types, forming 3 bipolar value dimensions, whose meanings are summarized in Table A1 (Appendix).

[11] Note that one value has become significant for each bipolar value dimension. See Table A1 (Appendix).

[12] As a result of the first principal component analysis, the *values* variable runs between -3.12 and 3.97. The lowest value (-3.12) is for Switzerland whose values are expected to promote economic development the most. See Table A2 (Appendix).

4. Baseline results

The baseline results are reported in Table 1. My understanding of values suggests that they are exogenous in the developmental process[13], which is supported by Schwartz's conceptualization too; accordingly, I do not assume any risk of reverse causality between *values* and per capita GDP.

Table 1: Regressions on log per capita GDP in 2010 with the Area 2 sub-index of the EFW Index - dependent variable: ln GDP per capita 2010

	OLS				TSLS			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
const	4.952*** (0.965)	5.500*** (0.899)	3.433* (1.790)	3.472* (1.751)	5.931*** (0.948)	6.260*** (0.935)	3.646** (1.480)	3.522** (1.468)
values	-0.145** (0.060)	-0.963*** (0.327)	-0.123*** (0.054)	-0.933*** (0.237)	-0.187** (0.088)	-1.004*** (0.356)	-0.142** (0.070)	-0.986*** (0.354)
ln area2	2.505*** (0.499)	2.277*** (0.460)	1.926*** (0.543)	1.673*** (0.496)	1.986*** (0.532)	1.878*** (0.511)	1.623** (0.737)	1.520** (0.711)
values* ln area2		0.429** (0.164)		0.431*** (0.119)		0.435** (0.166)		0.456*** (0.168)
ln edu_1920			0.137 (0.134)	0.158 (0.127)			0.173 (0.147)	0.180 (0.136)
ln cen_lat			0.453 (0.284)	0.556* (0.282)			0.500 (0.383)	0.592 (0.393)
N	54	54	52	52	52	52	51	51
adjusted R^2	0.661	0.683	0.671	0.696	0.651	0.672	0.667	0.695
Hausman test					p=0.298	p=0.423	p=0.491	p=0.764
first stage F statistic					35.947 p=0.000	34.637 p=0.000	43.022 p=0.000	45.771 p=0.000
Akaike criterion	106.550	103.969	97.704	94.418	264.983	258.977	242.586	233.953

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

However, *a priori* there may be a suspicion of endogeneity in formal institution in the process of development, so besides the OLS regression I have also used an instrumental variable approach. To instrument the institutional variable (*ln area2*) I have used the formalism index[14] of Djankov et al. (2003). This measure (the number of formal legal procedures necessary to resolve a simple case of collecting on an unpaid check) seems to be a valid instrument for my institutional variable because it induces changes in the explanatory variable (*lnarea2*) but has no direct effect on the dependent variable. As said before, the institutional variable (*lnarea2*) expresses the rule of law, and

[13] Values are inherited from generation to generation rather than being voluntarily acquired, they are "largely a 'given' to individuals throughout their lifetimes" (Becker 1996:16).

[14] This index reflects the effectiveness of courts as mechanisms of resolving simple disputes.

as Djankov et al. (2003) explained and showed, formalism is systematically greater in civil law as opposed to common law countries, the former being associated with a lower, the latter with a higher, rule of law. That is, the instrument, namely procedural formalism, is directly linked to institutions of the rule of law (the explanatory variable). On the other hand, while there is a convincing literature on the relationship between the rule of law and long-run economic performance, arguing that income is higher in countries with a higher level of the rule of law (e.g., La Porta et al. 2008), we do not have a theory about the possible direct impact of procedural formalism on long-run income. Besides, of course, having theoretical grounds for a use of a variable as an instrument, the instrument must pass a weak instruments test as well. As reported in Tables 1-4 and 6-7, the procedural formalism index meets all formal requirements vis-à-vis an instrument.

The interaction term is the key variable in my investigation; it is considered capable of capturing the "stuck-togetherness" of individual values and institutions explained above in the framework of the theory of institutional stickiness. It shows the additional impact of individual values on income, depending on the level of *institutions*. Accordingly, I will include it in some specifications.

Column 1 and 3 of Table 1 contains the OLS results without the interaction term. The *values* variable is statistically significant at the 1% level with a negative sign[15], as expected. *Ln area2* is highly significant, too. However, the human capital variable is not significant, but it seems that it has an indirect effect (together with the geographical variable), working via institutions since the coefficient of *ln area2* is reduced once we control for *ln cen_lat* and *ln edu_1920*. The geographical variable is not significant (but it is if the interaction term is included).[16]

At first glance, the insignificance of the human capital variable seems to be strange and contradictory to the results of the literature (e.g., Glaeser et al. 2004, Barro 2001). But once we take into account that as a proxy for human capital I have used the

[15] The sign of the coefficient of the first principal component of the three values is expected to be negative. This is because the countries whose values are more favorable to development have negative *values*, and those countries whose *values* are unfavorable to development have positive *values*. See Table A2 (Appendix).

[16] Note, however, that concerning the question of whether geography affects development or not, the literature is divided: according to Sachs (2003) geography has a direct impact on long-run income, while Rodrik et al. (2004) finds that it does not have a direct impact once one controls for institutions.

primary school enrollment ratio in 1920[17] it turns out that the missing significance does not necessarily act against the view that human capital is a factor in economic development. Basically, because of two things. First, the view that education is a root cause of development (e.g., Glaeser et al. 2004) is contested by many scholars, arguing that education basically raises the quality of institutions, which, in turn, causes economic development (e.g., Acemoglu et al. 2001). This latter view suggests that education does not increase productivity; instead its effect is indirect, working via institutions.[18] Second, the simple fact that the data refer to 1920 may lead to a much weaker association between today's income and education.[19]

In column 2 and 4 of Table 1 I have added the interaction term of the *values* and *ln area2* variables. Relying on a theory when designing the empirical approach is, of course, of primary importance, but one still needs to verify whether the inclusion of the interaction term is statistically meaningful at all. So first of all, it is worth looking at the goodness of fit of the specifications which include the interaction term, as well as those without them. Clearly, the interaction-term specifications (column 2 and 4) are better models than those in column 1 and 3, respectively, as suggested by the Akaike criterion.

When it comes to the results in detail, it turns out that both the *values* and *ln area2* variables are significant, suggesting that they complement one other in supporting economic development. In addition, the interaction term is highly significant, too. This may suggest that individual values and a sticky formal institution (here the rule of law measured by *ln area2*) have an impact on long-run income not only on their own; but there is an additional impact due to their "stuck-togetherness" in the developmental process. To better understand the interaction of values and institutions, it is worth looking at the marginal effect of values on long-run income, both with and without the interaction term. Accordingly, I compare the marginal effect in column 3 with the one

[17] As explained above, the reason for using this historical data is that this allows me to minimize the reverse causality effect between education and economic development: we have some reasons to believe that education in 1920 is related to GDP per capita in 2010, but there is no reason to assume the other way round.

[18] Note also that it is much more likely that secondary and/or tertiary school enrollment would be better candidates for productivity increases than primary school enrollment.

[19] To get some information about the „presence" of the above possible explanations for the insignificance of my variable, I have run regressions including only *ln edu_1920* and *ln cen_lat*, and both variables have become highly significant (adjusted R-squared is 0.4627), but when controlling for institutions (*ln area2*), *ln edu_1920* loses its significance and its coefficient decreases a lot. This suggests that primary school enrollment exercises only an indirect effect on development when controlling for institutions.

in column 4: if the *ln area* variable is greater than 1.88[20] – the first country in my sample to reach this threshold value is Chile, and there are 28 countries (out of 52) in my sample above this threshold value – the marginal effect of *values* with the interaction term will be greater than without it. A straightforward conclusion from this is that the interaction of values and institutions, i.e., their "stuck-togetherness", amplifies, in the long run, the impact of values on development in the good-institution countries.

Column 4 highlights one more important finding: the sign of the coefficient on the interaction term is just the opposite of the sign of the coefficient on *values*. This may suggest that lower (negative) *values* (meaning individual values more conducive to development, see Table A2) support development positively if sticky institutions (*ln area2*) are better. In other words, better formal institutions increase the marginal income-increasing effect of those individual values that are favorable to development.

To be clear, the above two findings are not the same. The first asserts that when the quality of the formal institutions is beyond a certain level (which is quite high, Chile in my sample), then the "stuck-togetherness" of values and institutions makes the marginal effect of values greater as compared to its marginal effect without taking into account the interaction term. This means that the "stuck-togetherness" of culture and formal institutions reinforces the effect of culture on development. The second finding argues that countries with better formal institutions gain most from values favorable to development (that is the lower *values* variable), which highlights the beneficial effect of the correspondence between culture and formal institutions in development. Both findings suggest that there is a strong complementary effect between individual values and sticky institutions in economic development.

To check for various estimator biases, columns 5 to 8 show the instrumental variable estimation results. The formalism index seems to be a valid instrument for the *ln area2* variable (see first stage F statistic reported in the table). As suggested by the Hausman tests, the *ln area2* variable is not endogenous, so we can rely on the OLS results because the estimations are consistent.

[20] This value comes from this equation: $-0.9329 + 0.431\ln(area2) \geq -0.1226$

5. Robustness checks

Here I will present the results of extensive robustness checks in order to test whether the results are sensitive to (1) the use of alternative measures of an institution, (2) to the use of an alternative measure of long-run income, (3) to the inclusion of additional squared terms, (4) to different control variables, (5) to the inclusion of more control variables, or (6) to the inclusion of additional interactions of values (with education).

To avoid worries that the results depend on the choice of the institutional variable, the first line of robustness checks consists of using alternative measures for an institution. I have used two different institutional variables: the rule of law[21] (averaged from 1996 to 2010) from the Worldwide Governance Indicators (WGI) developed by Kaufmann et al. (2010)[22] (*RoL_WGI*) and a recently developed rule of law measure from Gutmann and Voigt (2015)[23] (*RoL_G&V*). Table 2 displays the results with the *RoL_WGI* variable, Table 3 with *RoL_G&V*.

The pattern of the results with the two alternative formal institutions is exactly the same as I had in the baseline specification: (1) both *values* and the institutional variable are highly significant in each specification, (2) the interaction term is significant and positive, and (3) the OLS estimators seem to be consistent (meaning that the formal institution is not endogenous). Of course, the threshold values for the institutional measures – above which the marginal effect of values with the interaction term is greater than without it – are different[24], but there is an almost perfect overlap in the samples of good-institution countries. The interpretation of the results must be the same as before.

[21] The rule of law measures the extent to which individuals "have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al. 2010:4).

[22] Available at: http://info.worldbank.org/governance/wgi/index.aspx#home

[23] This measure is the only *de facto* indicator for the rule of law, taking the quality of the legal norms explicitly into account. Gutmann and Voigt (2015) use questions from the World Justice Project Rule of Law survey (http://worldjusticeproject.org/) to construct their theory-driven measure.

[24] In the case of the *RoL_WGI*, the first country to reach the threshold value is Russia, and there are 30 countries above it. In the case of the *RoL_G&V*, the first country to reach the threshold value is the UK, and there are 26 countries above.

Table 2: Regressions on log per capita GDP in 2010 with the Rule of Law measure of the WGI - dependent variable: ln GDP per capita 2010

	OLS				TSLS			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
const	9.103*** (0.147)	9.295*** (0.134)	6.700*** (1.197)	6.362*** (1.125)	9.195*** (0.119)	9.359*** (0.138)	6.470*** (1.754)	6.237*** (1.601)
values	-0.140** (0.064)	-0.265*** (0.084)	-0.116* (0.059)	-0.228*** (0.072)	-0.177** (0.083)	-0.289** (0.1107)	-0.141** (0.068)	-0.247** (0.096)
RoL_ WGI	0.757*** (0.153)	0.712*** (0.130)	0.628*** (0.186)	0.593*** (0.157)	0.629*** (0.168)	0.621*** (0.155)	0.529** (0.226)	0.536*** (0.202)
values* RoL_ WGI		0.164** (0.062)		0.159*** (0.056)		0.162** (0.065)		0.164** (0.064)
ln edu_1920			0.099 (0.125)	0.095 (0.110)			0.136 (0.145)	0.115 (0.120)
ln cen_lat			0.457* (0.262)	0.570** (0.245)			0.492 (0.344)	0.590* (0.323)
N	56	56	53	53	53	53	51	51
adjusted R^2	0.714	0.759	0.723	0.773	0.714	0.761	0.716	0.770
Hausman test					p=0.391	p=0.513	p=0.457	p=0.637
first stage F statistic					42.455 p=0.000	41.982 p=0.000	49.308 p=0.000	50.179 p=0.000
Akaike criterion	100.179	91.421	89.634	80.020	409.148	399.802	373.772	363.671

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

Table 3: Regressions on log per capita GDP in 2010 with the Rule of Law measure of Gutmann and Voigt (2015) - dependent variable: ln GDP per capita 2010

	OLS				TSLS			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
const	6.808*** (0.686)	7.088*** (0.599)	4.839*** (1.653)	4.379*** (1.578)	7.537*** (0.602)	7.757*** (0.564)	4.736*** (1.560)	4.084*** (1.500)
values	-0.176*** (0.064)	-0.953*** (0.227)	-0.138* (0.071)	-0.895*** (0.2107)	-0.226** (0.090)	-1.000*** (0.259)	-0.161* (0.085)	-0.950*** (0.252)
RoL_ G&V	4.328*** (1.020)	4.220*** (0.911)	3.498*** (1.109)	3.532*** (0.984)	3.221*** (1.000)	3.215*** (0.903)	2.615** (1.278)	2.744** (1.120)
values* RoL_ G&V		1.225*** (0.346)		1.219*** (0.354)		1.233*** (0.352)		1.294*** (0.365)
ln edu_1920			0.142 (0.115)	0.125 (0.094)			0.207 (0.128)	0.195** (0.093)
ln cen_lat			0.431 (0.268)	0.583** (0.256)			0.526 (0.359)	0.707** (0.341)
N	49	49	46	46	47	47	45	45
adjusted R^2	0.691	0.749	0.710	0.775	0.688	0.752	0.703	0.779
Hausman test					p=0.167	p=0.138	p=0.259	p=0.211
first stage F statistic					46.87 p=0.000	46.8868 p=0.000	44.9559 p=0.001	43.3144 p=0.001
Akaike criterion	94.910	85.659	83.516	72.631	179.535	168.848	161.910	148.840

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

Table 4 displays parameter estimates for specification with log GDP per capita averaged for the period 1962-2010. The only difference as compared to the results in

Table 1 is that the human capital variable (*ln edu_1920*) is now significant, which is even more in line with the results of the literature (for instance Barro 2001), but the geographical variable is not (see also footnote 16). So seemingly, the baseline results are not sensitive to a different measure of long-run income.

Table 4: Regressions on log per capita GDP averaged for the period 1962-2010 with the Area 2 sub-index of the EFW Index - dependent variable: ln GDP per capita 1962-2010_average

	OLS		**TSLS**	
const	5.240*** (1.031)	5.253*** (0.994)	5.391*** (0.998)	5.30*** (0.965)
values	-0.134** (0.053)	-0.618*** (0.148)	-0.150** (0.065)	-0.701*** (0.229)
ln area2	1.332*** (0.380)	1.176*** (0.369)	1.051 (0.643)	0.965 (0.638)
values*ln area2		0.261*** (0.995)		0.301*** (0.103)
ln edu_1920	0.189* (0.103)	0.210** (0.10)	0.228* (0.120)	0.244** (0.114)
ln cen_lat	0.121 (0.153)	0.181 (0.149)	0.172 (0.203)	0.233 (0.277)
N	50	50	49	49
adjusted R^2	0.712	0.724	0.709	0.725
Hausman test			p=0.424	p=0.611
first stage F statistic			43.202 p=0.000	45.771 p=0.000
Akaike criterion	64.9242	63.7164	200.5212	193.8680

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

As a combination of two kinds of robustness checks, I have also run the regressions with the above alternative institutional variables (*RoL_WGI, RoL_G&V*) and with the alternative measure of long-run income, and the results are very similar to those with the *ln area2*.[25]

To avoid misspecification with an interaction term it is recommended to enter more squared terms into the regression in order to check whether the interaction term is not spuriously capturing left-out squared terms (see Ozer-Barri and Sorensen 2010). Following this procedure, in Table 5 I report the results of specifications including two additional squared terms.

[25] These results are not reported, they are available upon request.

Column 1 in Panel A is column 4 from Table 2, while column 2 shows an estimation in which I control not only for the main terms besides the interaction term, but also for the square of both main terms. As can be seen from the table, neither of the squared terms is significant while the coefficients of the main terms are roughly the same and the interaction term looses its significance. But more importantly, the goodness of the fit based on the Akaike criterion is better for the baseline specification.

Panel B displays the results with the *ln area2* variable. Although the pattern of the results is somewhat different now[26], the conclusion is the same: the specification without the squared terms is superior in terms of the goodness of fit. Accordingly, it does not seem that the interaction term captures the effect of some left-out squared terms.

Table 5: OLS regressions on log per capita GDP in 2010 with additional squared terms - dependent variable: ln GDP per capita 2010

Panel A			**Panel B**		
	1	**2**		**1**	**2**
const	6.362** (1.125)	6.270*** (1.015)	const	3.472* (1.751)	7.953*** (2.727)
values	-0.228*** (0.072)	-0.240*** (0.086)	values	-0.933*** (0.237)	-1.141* (0.606)
RoL_WGI	0.593*** (0.157)	0.563* (0.293)	ln area2	1.673*** (0.496)	-3.816 (3.245)
values*RoL_WGI	0.159*** (0.056)	0.183 (0.109)	values*ln area2	0.431*** (0.119)	0.551* (0.331)
ln edu_1920	0.095 (0.110)	0.085 (0.099)	ln edu_1920	0.158 (0.127)	0.091 (0.133)
ln cen_lat	0.570** (0.245)	0.592*** (0.214)	ln cen_lat	0.556* (0.282)	0.631** (0.284)
sq_values		0.005 (0.035)	sq_values		-0.008 (0.035)
sq_RoL_WGI		0.039 (0.211)	sq_ln area2		1.600* (0.942)
N	53	53	N	52	52
adjusted R^2	0.773	0.764	adjusted R^2	0.696	0.694
Akaike criterion	80.019	83.890	Akaike criterion	94.418	96.438

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

[26] Here the institutional variable (*ln area2*) loses its significance and has a "wrong" sign, and there are important changes in the coefficients once we control for the squared terms.

Table 6 reports the results with different control variables: instead of education in 1920 and the latitude of a country's centroid, I have included an alternative geographical variable, the percentage of a country's land area in the tropics (*ln tropical area*) from Gallup et al. (1999), and *ethnic fractionalization* from Fearon (2003). Neither *ln tropical area* nor *ln ethnic fractionalization* is statistically significant, which is not a surprise since the results of the literature on the effect of these variables are rather mixed.[27] I have also run regressions with the alternative institutional variables I used above (*RoL_WGI, RoL_G&V*) and with these two new controls, and the results are very similar to those with the *ln area2* variable.[28]

In addition to the original control variables, I have included two more variables: a dummy for *English legal origin* (La Porta et al. 1999) and a dummy for whether the country is *landlocked* (GeoDist database)[29]. Results shown in Table 7 reaffirm those presented in Table 1. Parameter estimates in column 2 as compared to those in column 4 in Table 1 are only slightly different, and there is no sign for the endogeneity of the institutional variable. I have also run the regression with the alternative institutional variables (*RoL_WGI, RoL_G&V rule of law*) and with the extended set of controls, and the results are very similar to those with the *ln area2* variable.[30]

[27] For the geographical variables, see footnote 16; for fractionalization, see Fearon (2003).

[28] These results are not reported, they are available upon request.

[29] Available at: http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6

[30] These results are not reported, they are available upon request.

Table 6: Regressions on log per capita GDP in 2010 with the Area 2 sub-index of the EFW Index with different control variables - dependent variable: ln GDP per capita 2010

	OLS		TSLS	
	1	**2**	**3**	**4**
const	5.147*** (1.124)	5.711*** (0.841)	6.916*** (1.395)	7.221*** (1.332)
values	-0.116* (0.066)	-1.324** (0.508)	-0.145* (0.073)	-1.249** (0.550)
ln area2	2.323*** (0.560)	2.089*** (0.431)	1.472** (0.697)	1.359** (0.664)
values*ln area2		0.614** (0.254)		0.561** (0.272)
ln tropical area	-0.176 (0.604)	-0.058 (0.560)	-0.746 (0.767)	-0.565 (0.708)
ln ethnic fractionalization	-0.117* (0.064)	-0.122 (0.060)	-0.075 (0.059)	-0.084 (0.057)
N	52	52	50	50
adjusted R^2	0.642	0.671	0.626	0.654
Hausman test			p=0.121	p=0.147
first stage F statistic			51.836 p=0.000	55.608 p=0.000
Akaike criterion	104.600	100.973	235.843	232.592

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

Table 7: Regressions on log per capita GDP in 2010 with the Area 2 sub-index of the EFW Index, and with more control variables - dependent variable: ln GDP per capita 2010 - control variables: ln edu_1920, ln cen_lat, landlocked, English legal origin

	OLS		TSLS	
	1	**2**	**3**	**4**
const	3.979*** (1.298)	4.017*** (1.271)	3.971*** (1.292)	3.800*** (1.317)
values	-0.079 (0.087)	-0.888** (0.313)	-0.059 (0.117)	-0.719* (0.365)
ln area2	2.012*** (0.626)	1.754*** (0.569)	2.298** (1.065)	2.356** (1.032)
values*ln area2		0.430*** (0.157)		0.367** (0.167)
N	52	52	51	51
adjusted R^2	0.712	0.740	0.714	0.732
Hausman test			p=0.686	p=0.351
first stage F statistic			22.689 p=0.000	24.822 p=0.000
Akaike criterion	92.406	88.053	230.502	221.568

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

Finally, Table 8 compares the results obtained with the baseline specification to results for a specification that includes an alternative interaction of individual values, in addition to the interaction of individual values with an institution (*ln area2*). The purpose of this exercise is twofold. First, this estimation tests whether the interaction effect found so far potentially takes up the variation of another different effect of individual values. Second, we have to test whether the estimate accounts for another factor that might be necessary for values to "successfully" affect development. This factor could be human capital as identified in the literature by many as a factor affecting long-run income (e.g., Barro 2001); accordingly, I will include the interaction of values with education.

Table 8: OLS regressions on log per capita GDP in 2010 with an additional interaction term - dependent variable: ln GDP per capita 2010

	1	**2**	**3**	**4**
const	5.500*** (0.899)	3.472* (1.751)	3.235* (1.827)	3.367* (1.757)
values	-0.963*** (0.327)	-0.933*** (0.237)	-0.545*** (0.139)	-0.886*** (0.245)
ln area2	2.277*** (0.460)	1.673*** (0.496)	2.043*** (0.530)	1.805*** (0.486)
values*ln area2	0.429** (0.164)	0.431*** (0.119)		0.300* (0.161)
ln edu_1920		0.158 (0.127)	0.061 (0.136)	0.116 (0.133)
ln cen_lat		0.556* (0.282)	0.529* (0.290)	0.5603* (0.289)
values*ln edu_1920			0.126*** (0.035)	0.059 (0.054)
N	54	52	52	52
adjusted R^2	0.683	0.696	0.691	0.692
Akaike criterion	103.969	94.418	95.2650	95.887

*Standard errors are in parentheses and are robust. Letters in the upper index refer to significance: ***: significance at 1%, **: significance at 5%. *: significance at 10%.*

Columns 1 and 2 in Table 8 replicate the baseline results. In column 3 an interaction of individual values and education in 1920 is added, but not the interaction of values and the institution. Now the coefficient of the *values* variable changes to an important extent. Column 4 includes both interaction terms. The results indicate that adding an additional source does not quantitatively affect the parameter estimates for *values*, *ln area2* and the interaction term (comparing column 4 to column 2). Moreover,

the standard errors remain almost unaffected when the additional interaction term is added. In addition, as shown by the Akaike criterion the best model is the baseline specification (column 2).

To sum up, the earlier results do not merely reflect variation from other channels or interaction term. So the interaction of values and the sticky formal institution is a pivotal source of cross-country differences in long-run income.

6. Conclusion

In this paper my intention has been to take a step towards improving our understanding of how culture affects economic development, following the route proposed by those scholars who argue that the "culture-development" literature should focus on more specific questions instead of "grandiose" ones. In this spirit, relying on the theory of institutional stickiness (Boettke et al. 2008), I have proposed to unbundle culture into layers exhibiting different degrees of stickiness, because this theory provides us with straightforward hints concerning the possible interaction between the "deep" cultural layer and sticky formal institutions in the developmental process. More specifically, the theoretical framework has suggested that deep cultural values are embodied and crystallized in the stickiest formal institutions of a society, leading to a "stuck-together" phenomenon, which makes the impact of values very unique.

The cross-country regression analyses, including IV estimations, have provided evidence that both values and sticky formal institutions are strong determinants of long-run income. I have also found that their interaction, i.e., the "stuck-togetherness", acts as a separate factor in development. Furthermore, I have showed that better formal institutions increase the marginal income-increasing effect of those individual values that are favorable to development, that is, the marginal effect of values depends on the quality of sticky institutions. I have also evidenced that when formal institutions are good enough (i.e., better than a threshold value) the "stuck-togetherness" of values and institutions amplifies the impact of values on development.

The analysis has focused on the role of the "deep" cultural layer, but of course, its impact should ideally be contrasted with that of the less sticky cultural layers, such as religiosity, trust etc. There is still so much work to do in the layer model of culture.

References

Acemoglu D., Johnson S., Robinson J. A. (2001), 'The Colonial Origins of Comparative Development: An Empirical Investigation', *American Economic Review,* 9(5), 1369-401.

Ahlerup P., Olsson O., Yanagizawa D. (2009), 'Social Capital vs Institutions in the Growth Process', *European Journal of Political Economy,* 25, 1-14.

Akçomak I. S., ter Weel B. (2009), 'Social Capital, Innovation and Growth: Evidence from Europe', *European Economic Review,* 53, 544-567.

Barro R. J. (2001), 'Human Capital and Growth', *American Economic Review,* 91(2), Papers and Proceedings, 12-17.

Becker G. (1996), 'Preferences and Values', in Becker, G. (ed.), *Accounting for Taste*, Cambridge, Harvard University Press.

Benavot A., Riddle P. (1988), 'The Expansion of Primary Education, 1870-1940: Trends and Issues', *Sociology of Education,* 61(3), 191-210.

Berggren N., Elinder M., Jordahl H. (2007), 'Trust and Growth: A Shaky Relationship', *Empirical Economics,* 35(2), 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.

Beugelsdijk S., van Schaik A. B. T. M. (2005a), 'Differences in Social Capital between 54 Western European Regions', *Regional Studies*, 39(8), 1053-1064.

Beugelsdijk S., van Schaik A. B. T. M. (2005b), 'Social Capital and Growth in European Regions: An Empirical Test', *European Journal of Political Economy,* 21, 301-324.

Beugelsdijk S. (2006), 'A Note to the Theory and Measurement of Trust in Explaining Differences in Economic Growth', *Cambridge Journal of Economics*, 30, 371-387.

Boettke P. J., Coyne C. J., Leeson P. T. (2008), 'Institutional Stickiness and the New Development Economics', *American Journal of Economics and Sociology*, 67(2), 331-358.

Casey T. (2004), 'Social Capital and Regional Economies in Britain', *Political Studies*, 52, 96-117.

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

Durlauf S. (2002), 'On the Empirics of Social Capital', *Economic Journal*, 112(483), 459-479.

Durlauf S. N., Fafchamps M. (2005), 'Social Capital', in Aghion, P., Durlauf, S. N. (eds.), *Handbook of Economic Growth Vol. 1B*, Amsterdam, North-Holland. pp. 1639-1699.

Edwards M. S., Patterson D. (2009), 'The Influence of Cultural Values on Economic Growth: An Expanded Empirical Investigation', *Journal of Political Science*, 37, 148-173.

Fearon J. D. (2003), 'Ethnic and Cultural Diversity', *Journal of Economic Growth*, 8(2), 195-222.

Fukuyama F. (1995), Trust: The Social Virtues and the Creation of Prosperity, New York, The Free.

Gallup J. L., Sachs J. D., Mellinger A. D. (1999), 'Geography and Economic Development', Working Paper, Center for Economic Development at Harvard University

Glaeser E., La Porta R., Lopez-de-Silanes F., Shleifer A. (2004), 'Do Institutions Cause Growth?', *Journal of Economic Growth*, 9, 271-303.

Gorodnichenko Y., Roland G. (2010), 'Culture, Institutions and the Wealth of Nations', NBER Working Paper 16368.

Gorodnichenko Y., Roland G. (2011), 'Which Dimensions of Culture Matter for Long-Run Growth?', *American Economic Review*, 101(3), 492-498.

Granato J., Inglehart R., Leblang D. (1996), 'The Effect of Cultural Values on Economic Development: Theory, Hypotheses, and Some Empirical Tests', *American Journal of Political Science*, 40(3), 607-631.

Guiso L., Sapienza P., Zingales L. (2006), 'Does Culture Affect Economic Outcomes?', *Journal of Economic Perspectives*, 20(2), 23–48.

Gutmann J., Voigt S. (2015), 'The Rule of Law: Measurement and Deep Roots', CESifo Working Paper No. 5670.

Gwartney J. D., Lawson R., Hall J. (2012), *Economic Freedom of the World. Annual Report 2012*, Vancouver, The Fraser Institute.

Herrmann-Pillath C. (2010), 'What Have We Learnt From 20 Years of Economic Research Into Culture?', *International Journal of Cultural Studies,* 13(4), 317-335.

Hofstede G. (1980), Culture's Consequences: International Differences in Work-Related Values, Beverly Hills, Sage Publications.

Inglehart R. (1990), *Culture Shift in Advanced Industrial Society*, Princeton, Princeton University Press.

Jackman R. W., Miller, R. A. (1996), 'A Rennaissance of Political Culture?', *American Journal of Political Science*, 40(3), 623-659.

Kaufman D., Kraay A., Mastruzzi M. (2010) 'The Worldwide Governance Indicators: Methodology and Analytical Issues', World Bank Policy Research Working Paper 5430. Washington, D. C., The World Bank.

Klasing M. (2013), 'Cultural Dimensions, Collective Values and their Importance for Institutions', *Journal of Comparative Economics,* 41(2), 447-467.

Knack S., Keefer Ph. (1997), 'Does Social Capital Have an Economic Payoff? A Cross-Country Investigation', *Quarterly Journal of Economics*, 112(4), 1251-1288.

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., Shleifer A. (2008), 'The Economic Consequences of Legal Origin', *Journal of Economic Literature*, 46(2), 258-332.

Landes D. (2000), 'Culture Makes Almost All the Difference', in Harrison, L. E., Huntington, S. P. (eds.), *Culture Matters*, New York, NY, Basic Books.

Manski C. F. (2000), 'Economic Analysis of Social Interactions', *Journal of Economic Perspectives*, 14(3), 115-136.

Mathers R. L., Williamson C. R. (2011), 'Cultural Context: Explaining the Productivity of Capitalism', *Kyklos,* 64(2), 231-252.

Migheli M. (2017), 'Ubuntu and Social Capital: a Strong Relationship and a Possible Instrument for Socio-Economic Development', *Cambridge Journal of Economics*, 41(4), 1213-1235.

Moore M. (1999), 'Truth, Trust, and Market Transactions: What Do We Know?', *Journal of Development Studies*, 36(1), 74-88.

Olson M. (1982), *The Rise and Decline of Nations*, New Haven, Yale University Press.

Ozer-Barri H., Sorensen B. E. (2012), 'Interaction Effects in Econometrics', MPRA Paper No. 38608. Available at: https://mpra.ub.uni-muenchen.de/38608/

Putnam R. D., Leonardi R., Nanetti R. (1993), *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton, Princeton University Press.

Rodrik D., Subramanian A., Trebbi F. (2004), 'Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development', *Journal of Economic Growth*, 9(2), 131-165.

Roth F. (2009), 'Does Too Much Trust Hamper Economic Growth?', *Kyklos*, 1, 103-128.

Sachs J. D. (2003), 'Institutions Don't Rule: Direct Effects of Geography on Per Capita Income', NBER Working Paper No. 9490.

Schneider G., Plumper T., Bauman S. (2000), 'Bringing Putnam to the European Regions: On the Relevance of Social Capital for Economic Growth', *European Urban and Regional Studies*, 7(4), 307-317.

Schwartz S. H. (1994), 'Are There Universal Aspects in the Content and Structure of Values?', *Journal of Social Issues*, 50(4), 19-45.

Schwartz S. H. (1999), 'A Theory of Cultural Values and Some Implications for Work', *Applied Psychology: An International Review*, 48(1), 23-47.

Schwartz S. H. (2006), 'A Theory of Cultural Value Orientations: Explication and Applications', *Comparative Sociology*, 5(2-3), 137-182.

Smith A. (1759), *The Theory of Moral Sentiments*, London, A. Millar. Available at: http://www.econlib.org/library/Smith/smMS0.html

Swank D. (1996), 'Culture, Institutions, and Economic Growth: Theory, Recent Evidence, and the Role of Communitarian Polities', *American Journal of Political Science*, 40(3), 660-679.

Tabellini G. (2008), 'Presidential Address: Institutions and Culture', *Journal of the European Economic Association*, 6(2-3), 255-294.

Tabellini G. (2010), 'Culture and Institutions. Economic Development in the Regions of Europe', *Journal of the European Economic Association,* 8(4), 677-716.

Tambovtsev V. (2015), 'The Myth of the "Culture Code" in Economic Research', *Russian Journal of Economics*, 1, 294-312.

Weber M. (1930), *The Protestant Ethic and the Spirit of Capitalism*, London and New York, Routledge. 2001.

Williamson C. R., Mathers R. L. (2011), 'Economic Freedom, Culture, and Growth', *Public Choice,* 148, 313-335.

Williamson C. R. (2009), 'Informal Institutions Rule: Institutional Arrangements and Economic Performance', *Public Choice*, 139, 371-387.

Zak P. J., Knack S. (2001), 'Trust and Growth', *Economic Journal*, 111, 295-321.

Appendix

Table A1: Individual values and their meanings

bipolar values	meaning
embeddedness - autonomy (affective/intellectual)	In societies characterized by a high degree of embeddedness, individuals are embedded in the group, and expected to restrain actions that might disrupt the solidarity of the group or the traditional order. In (intellectually and affectively) autonomous societies, individuals can act independently, and pursue their own interests and goals.
hierarchy - egalitarianism	In highly hierarchical societies, there is an unequal distribution of power, roles and resources. In egalitarian societies collective action is achieved by voluntary cooperation of individuals who see themselves as equals.
mastery - harmony	Mastery stresses an emphasis on assertiveness and ambition in order to master the environment and reach personal and group goals. Harmony stresses the acceptance of the environment as it is and the importance of its preservation.

Source: based on Schwartz (1999)

Table A2: The values variable (first principle component of embeddedness, hierarchy, and mastery) for different countries

country	values score
Switzerland	-3.1228541
France	-3.0937073
Finland	-2.5536907
Norway	-2.5230127
Denmark	-2.4076238
Italy	-2.3953686
Czech Republic	-2.1345057
Netherlands	-2.1201832
Austria	-2.1009044
Germany	-1.8312891
Estonia	-1.7676773
Sweden	-1.7043800
Japan	-1.4996631
Spain	-1.3207466
Slovenia	-1.1034672
New Zealand	-1.0027514
Portugal	-0.7533094
Ireland	-0.6954554
Slovakia	-0.6348483
Russia	-0.5190318
Argentina	-0.3472935
Poland	-0.3207448
Hungary	0.0140658
Brazil	0.0140685
Greece	0.0363893
Canada	0.0760916
UK	0.1638548
Namibia	0.2520442
Korea, South	0.2789461
Australia	0.3383221
Hong Kong	0.3663400
Bolivia	0.4612732
US	0.5137944
Israel	0.5586731
Cyprus	0.5674211
Chile	0.5725719
Mexico	0.5924775
Venezuela	0.7193094
Georgia	0.7355377
China	0.7911763
Egypt	0.9930118
Peru	1.0420053
Singapore	1.1437892

country	values score
Zimbabwe	1.1626794
Taiwan	1.1871312
Ghana	1.4322880
Malaysia	1.4597242
Nepal	1.6027512
Macedonia	1.6234492
Bulgaria	1.7670387
Indonesia	1.8128017
Turkey	1.8470820
India	2.1693425
Philippines	2.3608735
Jordan	3.3235513
Nigeria	3.9726322