

WHICH DIMENSIONS OF CULTURE MATTER FOR LONG RUN GROWTH?*

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Abstract: We present empirical evidence that, among a variety of cultural dimensions, the individualism-collectivism dimension, based on Hofstede's (2001) data, is the most important and robustly significant effect of culture on long run growth. Other dimensions that have a significant effect, albeit less robust, are generally strongly correlated with individualism and convey similar information. We found no significant or robust effect on growth from cultural dimensions that are independent from the individualism-collectivism cleavage.

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1. Introduction.

In Yuriy Gorodnichenko and Gerard Roland (2010), we built an endogenous growth model that captures the trade-off between the innovation advantage of individualist culture giving social status rewards to innovators and the coordination advantage of collectivist culture where individuals internalize group interests to a greater extent. The model shows that individualism has a dynamic advantage leading to a higher economic growth rate whereas collectivism leads only to static efficiency gains and can have only a level effect. We provided empirical evidence of a *causal* effect of individualism on measures of long run growth (output per capita, productivity) and innovation by instrumenting individualism scores with the frequencies of blood types which are neutral genetic markers and plausibly satisfy the exclusion restriction. Parents transmit their culture as well as their genes to their children so that genetic data can proxy for vertical cultural transmission and it is unlikely that there is a direct feedback from e.g. output per capita to genes.

Since that research shows a powerful effect of culture on long run growth, the key question is what dimensions of culture other than individualism/collectivism matter for long run growth. In this paper, we look at the main existing cross-country measures of culture and analyze their effect on output per capita. We find essentially that only individualism has a robust effect.

2. Cultural variables.

We draw from the three main international databases providing cross-country measures of culture: the data base developed by Dutch sociologist Geert Hofstede, the one developed by cross-cultural psychologist Shalom Schwartz and the World Values Survey.

Dutch sociologist Hofstede (2001) initially used surveys of IBM employees in about 30 countries to study differences in corporate culture. To avoid cultural biases in the way questions are framed, the translation of the survey into local languages was done by a team of English and local language speakers. With new waves of surveys and replication studies, Hofstede's cultural data base has been

expanded to almost 80 countries and other studies on other professions have validated his measures.¹ Using factor analysis on answers to questions about goals in life and the workplace, he develops four measures of culture: individualism, power distance, masculinity and uncertainty avoidance. The *individualism* score is the first and most important component in his factor analysis. It measures the extent to which it is believed that individuals are supposed to take care of themselves as opposed to being strongly integrated and loyal to a cohesive group. The individualism component loads positively on valuing individual freedom, opportunity, achievement, advancement, recognition and negatively on valuing harmony, cooperation, relations with superiors. In other words, individuals in countries with a high level of the individualism score value personal freedom and status, while individuals in countries with a low level of the index value harmony and conformity. The *power distance* index measures the extent to which the less powerful members of organizations and institutions (in society and the family) accept and expect that power is distributed unequally. A higher value of the index means a higher acceptance of inequality in the distribution of power by those below. The index of *masculinity* refers to the dominance of men over women and to the dominance of “male” values such as assertiveness and competitiveness versus norms of caring and modesty. The *uncertainty avoidance* index measures a society's tolerance for uncertainty and the extent to which members of society feel either uncomfortable or comfortable in situations that are novel, unknown, surprising, different from usual. Uncertainty avoiding cultures try to minimize the possibility of such situations by strict laws and rules, safety and security measures. They are less tolerant and reject forms of diversity within society.

The data base established by Schwartz aimed at identifying a core set of values that have a common cross-cultural meaning. Schwartz (1994) gathered survey responses from K-12 schoolteachers and college students for a total of 195 samples drawn from 78 nations and 70 cultural groups between 1998 and 2000. Each sample generally consists of 180-280 respondents for a total of over 75,000 responses. Schwartz's value survey consists of 56-57 value items that ask respondents to indicate the

¹ The most current version of the data is available at <http://www.geert-hofstede.com/>.

importance of each as “a guiding principle in *my* life.” He has created on that basis cultural mappings. Similarly to the individualistic-collectivist dimension of cultures in Hofstede (2001), Schwartz differentiates cultures along the autonomy and embeddedness dimensions. In autonomous cultures, people are viewed as autonomous, bounded entities. They are encouraged to cultivate and express their own preferences, feelings, ideas, and abilities, and to find meaning in their own uniqueness by pursuing their own ideas and intellectual directions independently (*intellectual autonomy*) and by pursuing positive experiences for themselves (*affective autonomy*). In contrast, meaning in life for people living in cultures of *embeddedness* comes largely through social relationships, through identifying with the group, participating in its shared way of life, and striving toward its shared goals. Embedded cultures emphasize maintaining the status quo and restraining actions that might disrupt in-group solidarity or the traditional order. Countries that score high on embeddedness also score low on intellectual and affective autonomy. Other dimensions in the cultural mappings of Schwartz are as follows. *Hierarchy* measures the focus on the importance of hierarchical relations within society and in the political system so as to guarantee the stability of power, tradition and conformity. It stands in contrast to *egalitarianism* which emphasizes norms of universalism and equality of rights of individuals. *Harmony* measures emphasis on the smoothness of relations and avoidance of change and conflict whereas mastery emphasizes self-assertion and achievement as strong values that are promoted. As one can see, some of Schwartz’s dimensions can be related conceptually to Hofstede’s one-dimensional distinction between individualism and collectivism.

The World Values Survey (WVS) developed by Michigan political science professor Ronald Inglehart (2000) with a large international team is the database most widely used so far by economists trying to understand cultural differences across countries and their effects on economic outcomes. Surveys were conducted in four multi-year waves: 1981-1984; 1989-1993; 1994-1999; 1999-2004. The original 1981-1984 wave included 20 countries covering most European or Anglophone countries.

Since then, some 90 countries have been surveyed, some in multiple waves for a total of nearly 200 surveys. In each country, a baseline questionnaire is adapted and administered to a representative national sample. Over a quarter million respondents worldwide have provided responses to nearly a thousand questions. Questions focus on personal attitudes about life, family, and society; the environment; work; the importance of traditionalism; gender roles; democracy and government; health; education; religion, spirituality, and morality; and honesty. Since there are many related questions, we have built indices aggregating multiple questions. The aggregation is explained in the appendix table. Note that the question on generalized trust has been used extensively in the literature and is interpreted as adhesion to norms of citizenship and values of civic participation (see e.g. Guido Tabellini (2008) and Luigi Guiso *et al.* (2010)) in contrast to lack of general trust and reliance on clan, family and kinship relations. Note that the equality index built from the WVS is not identical to Schwartz's egalitarianism variable. The former is about preference for equality of income, possibly independently of effort, whereas the latter measures preference for universalism and equality of rights.

3. Regression results.

Table 1 tests the following econometric model:

$$\ln(Y_i) = \alpha_j Dim_{j,i} + X_i \gamma_j + error \quad (1)$$

where i and j index countries and cultural dimensions respectively, $\ln(Y)$ is real GDP per worker from the Penn World Tables in 2000, Dim is a cultural dimension, X is a vector of controls (if included). Columns (2) and (5) show results without controls. Columns (3) and (6) include geographical controls (a dummy for landlocked countries, absolute latitude and longitude, continental dummies). Columns (4) and (7) include both geographical and religious controls (the share of populations in a country practicing the major world religions). The instrumental variable is similar in spirit to the one used in Gorodnichenko and Roland (2010). It is the Euclidian distance for frequencies of blood types A and B between a given country and the country with the largest value of the cultural dimension that serves as

explanatory variable. This measure of blood distance thus varies across cultural dimensions. Column 1 in Table 1 shows the correlation coefficient of a cultural variable with Hofstede's individualism index.

Table 1 shows that individualism has a strong and robust effect on log GDP per capita, confirming the results of Gorodnichenko and Roland (2010). No other cultural variable from the Hofstede data base can be seen to have robust effects. Only the power distance index, which is strongly negatively correlated with individualism, has a negative effect in some specifications. Masculinity and uncertainty avoidance are not significant. None of the Schwartz variables is as robust as the individualism index. Observe however that affective and intellectual autonomy and egalitarianism, and to a lesser extent embeddedness, have a significant albeit less robust effect. These variables are also strongly correlated with the individualism index, which is not surprising since these variables convey a very similar meaning. In the WVS data, trust and tolerance are the most robustly significant, though again not as robust as the individualism index. These variables are also significantly correlated with the individualism index. Notice that hard work and thrift, market orientation, public good provision and preference for equality of income are not robustly significant. We also did separate regressions on other WVS questions and found basically no effect.²

Table 2 provides regressions with individualism together with other cultural dimensions. One can view these as "horse-race" regressions between individualism and other cultural dimensions without controls, with only geographical, and with geographical and religious controls. A quick glance at Table 2 shows that the individualism index is always significant whereas this is not the case for most cultural variables. Columns (3), (6) and (9) give the incremental change in R^2 from adding another cultural variable to individualism. In many cases, the effect of an additional cultural dimension is not significantly different from zero. Among Hofstede's cultural dimensions, only uncertainty avoidance is significant alongside individualism. Note that uncertainty avoidance was not significant when used as a

² Since the countries covered by the different data bases do not perfectly overlap, we cannot exclude the possibility that the WVS data miss important variation because countries are left out that might drive stronger results.

regressor without individualism. This suggests that uncertainty avoidance may have a “second order” or a “refinement” effect relative to individualism. Although uncertainty avoidance is negatively correlated with individualism, the coefficient associated to that variable is however positive. Among the Schwartz variables, note that embeddedness is significant with a negative effect and affective autonomy, intellectual autonomy and egalitarianism are also jointly positively significant. We saw that these variables were strongly correlated with individualism. The fact that they remain jointly significant with individualism suggests that these variables also contain additional information that is not contained in the Hofstede index which is not surprising given that cross-country measures of culture may have measurement errors. The WVS variables, on the other hand, are generally not significant in joint regressions with individualism.³

4. Conclusion.

We conclude from this exercise that the individualism-collectivism dimension is the central cultural variable that matters for long run growth. Other cultural variables may of course affect other aspects of economic behavior and economic performance but they do not appear to robustly influence long run growth.

To be clear, we do not seek to identify the “best” culture or provide a “ranking” of cultures in the world and we do not seek to recommend any cultural revolutions in various countries. The objective of our research is to better understand tradeoffs implied by different cultures which are deeply rooted in history and change very slowly. In our view, identifying effects of culture on economic outcomes should facilitate better dialogue and communication across cultures rather than turn cultures against one another.

³ Because cultural variables based on WVS could be noisier than cultural variables constructed by Hofstede and Schwartz, we may tend to find that Hofstede’s or Schwartz’s dimensions have more predictive power than WVS dimensions.

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Table 1. Output per capita and cultural dimensions.

	Correlation with individualism	OLS each regressor separately Specification (1)			IV each regressor separately Specification (1)		
		No controls	Geo controls	Geo & Religion controls	No controls	Geo controls	Geo & Religion controls
		(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Hofstede's cultural dimensions							
Individualism	1.00	0.648*** (0.077)	0.480*** (0.095)	0.511*** (0.117)	0.767*** (0.142)	0.743*** (0.205)	0.705*** (0.169)
Power Distance	-0.61*** (0.09)	-0.492*** (0.080)	-0.235*** (0.083)	-0.159 (0.096)	0.219 (1.549)	-0.415** (0.167)	-0.466** (0.227)
Masculinity	0.13 (0.11)	0.063 (0.102)	0.112 (0.088)	0.094 (0.087)	0.950 (0.716)	-0.441 (0.457)	-0.140 (0.251)
Uncertainty Avoidance	-0.23** (0.11)	0.168 (0.105)	0.006 (0.079)	0.159 (0.115)	3.298 (2.420)	0.273 (0.276)	0.210 (0.657)
Panel B: Schwartz's cultural dimensions							
Harmony	0.18 (0.14)	0.235* (0.134)	0.009 (0.126)	0.053 (0.094)	1.281*** (0.313)	0.487 (0.515)	0.105 (0.183)
Embeddedness	-0.62*** (0.13)	-0.748*** (0.076)	-0.640*** (0.090)	-0.285** (0.139)	-0.515* (0.276)	-0.443** (0.217)	-0.159 (0.384)
Hierarchy	-0.43*** (0.13)	-0.422*** (0.115)	-0.215 (0.130)	-0.030 (0.119)	-0.942*** (0.246)	-0.510 (0.560)	-0.454 (0.385)
Mastery	-0.23 (0.14)	0.008 (0.132)	0.038 (0.093)	0.041 (0.080)	-11.525 (42.205)	0.793 (0.517)	1.322 (2.905)
Affective autonomy	0.67*** (0.118)	0.700*** (0.083)	0.526*** (0.087)	0.197* (0.114)	0.922*** (0.127)	0.776*** (0.163)	0.458** (0.188)
Intellectual autonomy	0.60*** (0.13)	0.675*** (0.076)	0.506*** (0.120)	0.113 (0.162)	0.876*** (0.101)	0.892*** (0.196)	0.515** (0.218)
Egalitarianism	0.36*** (0.13)	0.426*** (0.079)	0.320*** (0.093)	0.157 (0.094)	1.067*** (0.233)	0.738*** (0.263)	0.220 (0.206)
Panel C: Cultural Indexes based on World Values Surveys							
Trust	0.39*** (0.10)	0.410*** (0.104)	0.158* (0.085)	-0.043 (0.095)	1.726** (0.685)	0.441** (0.193)	0.046 (0.201)
Hard work and thrift	-0.04 (0.13)	-0.063 (0.124)	-0.131 (0.094)	0.018 (0.079)	0.820 (0.614)	-0.457 (0.458)	-0.211 (0.235)
Tolerance	0.51*** (0.10)	0.502*** (0.119)	0.258** (0.121)	0.094 (0.100)	1.329*** (0.328)	0.385* (0.222)	0.032 (0.198)
Public good provision	-0.08 (0.15)	-0.074 (0.116)	0.101 (0.115)	0.004 (0.091)	-0.535* (0.284)	0.926* (0.533)	0.300 (0.315)
Equality	-0.39*** (0.14)	-0.376*** (0.110)	0.013 (0.109)	-0.029 (0.082)	-1.010*** (0.256)	0.784 (0.589)	0.356 (0.316)
Market orientation	-0.36*** (0.13)	-0.209 (0.132)	-0.090 (0.099)	0.020 (0.078)	2.908 (6.759)	6.582 (27.754)	0.064 (0.468)

Notes: All cultural dimensions are normalized to have zero mean and unit standard deviation. Number of observations is 76, 73, and 74 in Panels A, B, and C respectively. IV regressions with the first stage F-statistic exceeding 5 are highlighted in bold font. In columns (1) and (2), all cultural dimensions in a given panel are included simultaneously. Robust standard errors are in parentheses. ***, **, * denote significance at 0.01, 0.05, and 0.10 levels.

Table 2. Effect of individualism and other cultural dimensions on output per capita.

	No controls			Geo controls			Geo & Religion controls			Obs.
	Cultural dimension (1)	Individualism (2)	ΔR^2 (3)	Cultural dimension (4)	Individualism (5)	ΔR^2 (6)	Cultural dimension (7)	Individualism (8)	ΔR^2 (9)	
Panel A: Hofstede's cultural dimensions										
Power Distance	-0.151 (0.095)	0.553*** (0.101)	0.01	-0.081 (0.093)	0.433*** (0.114)	<0.01	-0.050 (0.101)	0.494*** (0.129)	<0.01	74
Masculinity	-0.015 (0.066)	0.650*** (0.075)	<0.01	0.019 (0.074)	0.473*** (0.098)	<0.01	-0.034 (0.080)	0.532*** (0.129)	<0.01	74
Uncertainty Avoidance	0.344*** (0.081)	0.731*** (0.085)	0.10	0.209*** (0.072)	0.611*** (0.102)	0.03	0.261** (0.110)	0.575*** (0.123)	0.02	74
Panel B: Schwartz's cultural dimensions										
Harmony	0.042 (0.112)	0.570*** (0.089)	0.07	-0.017 (0.101)	0.453*** (0.102)	0.03	0.011 (0.120)	0.387*** (0.119)	0.08	52
Embeddedness	-0.550*** (0.122)	0.276*** (0.069)	0.31	-0.407*** (0.132)	0.335*** (0.097)	0.10	-0.301* (0.158)	0.334*** (0.119)	0.10	52
Hierarchy	-0.158 (0.134)	0.510*** (0.118)	0.10	-0.223** (0.107)	0.412*** (0.108)	0.07	-0.120 (0.153)	0.355*** (0.116)	0.09	52
Mastery	0.110 (0.146)	0.599*** (0.090)	0.09	0.020 (0.110)	0.458*** (0.098)	0.03	0.123 (0.099)	0.396*** (0.112)	0.09	52
Affective autonomy	0.485*** (0.125)	0.292*** (0.083)	0.25	0.307** (0.119)	0.302** (0.112)	0.08	0.218 (0.143)	0.298** (0.139)	0.10	52
Intellectual autonomy	0.490*** (0.089)	0.337*** (0.080)	0.27	0.373*** (0.094)	0.382*** (0.105)	0.09	0.211 (0.139)	0.345*** (0.119)	0.09	52
Egalitarianism	0.196** (0.087)	0.506*** (0.100)	0.12	0.268*** (0.095)	0.394*** (0.105)	0.09	0.166 (0.166)	0.374*** (0.108)	0.09	52
Panel C: Cultural Indexes based on World Values Surveys										
Trust	0.122 (0.081)	0.572*** (0.082)	0.03	-0.011 (0.072)	0.501*** (0.099)	0.04	0.003 (0.131)	0.465*** (0.114)	0.03	70
Hard work and thrift	-0.058 (0.108)	0.660*** (0.081)	0.05	-0.076 (0.087)	0.519*** (0.097)	0.04	-0.013 (0.094)	0.461*** (0.125)	0.04	64
Tolerance	0.213 (0.145)	0.541*** (0.137)	0.09	0.075 (0.122)	0.429*** (0.120)	0.06	0.071 (0.145)	0.468** (0.174)	0.05	59
Public good provision	-0.213* (0.120)	0.656*** (0.081)	0.11	-0.103 (0.103)	0.514*** (0.097)	0.08	-0.156* (0.092)	0.532*** (0.153)	0.09	58
Equality	0.091 (0.123)	0.696*** (0.086)	0.06	0.219* (0.109)	0.552*** (0.087)	0.08	0.196 (0.128)	0.610*** (0.164)	0.06	58
Market orientation	0.069 (0.115)	0.663*** (0.096)	0.05	0.050 (0.092)	0.506*** (0.108)	0.07	0.056 (0.101)	0.424*** (0.145)	0.08	56

Notes: The table reports estimates of specification (1) when two cultural dimensions are included simultaneously: individualism and a dimension indicated in the left column. Columns (3), (6), (9) show the increase in the R^2 when a cultural dimension is included in addition to individualism and other controls. Column (10) shows the number of observations. All cultural dimensions are normalized to have zero mean and unit standard deviation. ***, **, * denote significance at 0.01, 0.05, and 0.10 levels.

Appendix Table. Definition of indexes constructed in the World Values Survey.

Index		Question in WVS	Weight
Trust	V23	Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? (yes = 1, no = 0)	1
Hard work and thrift	V17	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? Thrift, saving money and things (mention = 1, otherwise =0)	1
	V18	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? Determination, perseverance (mention = 1, otherwise =0)	1
Tolerance	V35	Could you please mention any that you would not like to have as neighbors? People of different race (mention = 1, otherwise =0)	-1
	V37	Could you please mention any that you would not like to have as neighbors? Immigrants/foreign workers (mention = 1, otherwise =0)	-1
	V16	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? Tolerance and respect for other people (mention = 1, otherwise =0)	1
	V15	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? Imagination (mention = 1, otherwise =0)	1
Public good provision	V200	Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between. Cheating on taxes if you have a chance (1 = never justifiable, 10 = always justifiable)	-1
	V199	Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between. Avoiding a fare on public transport (1 = never justifiable, 10 = always justifiable)	-1
	V20	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? Unselfishness (mention = 1, otherwise =0)	1
Equality	V116	How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between. Incomes should be made more equal.	1
	V115	Imagine two secretaries, of the same age, doing practically the same job. One finds out that the other earns considerably more than she does. The better paid secretary, however, is quicker, more efficient and more reliable at her job. In your opinion, is it fair or not fair that one secretary is paid more than the other? (Fair = 1, Not fair =0)	-1
Market orientation		How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between.	
	V118	Competition is good. It stimulates people to work hard and develop new ideas.	1
	V117	Private ownership should be increased.	1
	V118	The government should take more responsibility to ensure that everyone is provided for.	-1
	V115	Imagine two secretaries, of the same age, doing practically the same job. One finds out that the other earns considerably more than she does. The better paid secretary, however, is quicker, more efficient and more reliable at her job. In your opinion, is it fair or not fair that one secretary is paid more than the other? (Fair = 1, Not fair =0)	-1

Note: After summing standard responses to all questions with the weight indicated in the last column, we standardize the weighted sum to have zero mean and unit standard deviation.