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Does education engender cultural values that matter for economic growth?

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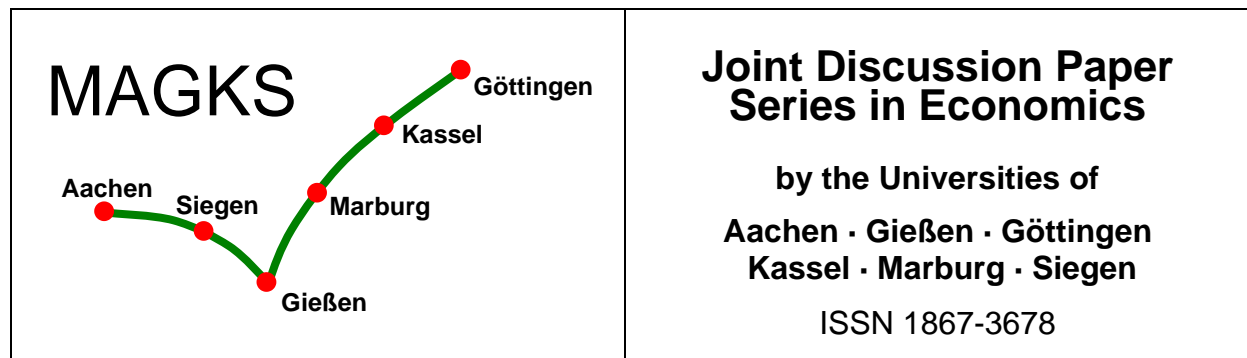
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Does education engender cultural values that matter for economic growth?

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Abstract

Empirical research has shown that cultural values matter for economic growth and has specifically identified the achievement motivation as an aspect of culture that engenders economic growth. If specific cultural values engender economic growth, how then can societies promote them? This paper attempts to answer this question using the 2005 wave of the World Values Survey data for 43 countries. We test the contention that education significantly impacts the relative importance an individual places on economic achievement vis-à-vis traditional social norms. Results suggest that individuals with higher education levels attach higher importance to values related to autonomy and economic achievement as compared to conformity to traditional social norms. The results have an important implication for efforts to promote economic development; institutions and specifically public policy on education could be used to encourage people to adopt values that are considered important for economic development.

Key words: Cultural Values, Education, Ordered Probit, Semi-Nonparametric Estimation.

JEL classification: D02, I21, O15.

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I. Introduction

Social scientists, in their quest to explain the differential economic growth performance across countries, have developed theories and conducted empirical research on both the economic and non-economic determinants of economic growth. Recently some scholars have emphasized the need to examine the role of cultural attributes of populations as a determinant of economic growth (Greif 1994, Granato et al. 1996 and Swank 1996). Since Weber (1958) analyzed the linkages between the Protestant Ethic and the rise of capitalism in Europe, many scholars have investigated which cultural attitudes and beliefs facilitate economic progress. Weber's original thesis was that dynamic capitalist development in northern Europe is explained by protestant attitudes toward work, thrift and accumulation. McClelland (1961, 1963) also suggest that high concentrations of values emphasizing the need for achievement are the engines that drive economic growth. In a similar line of analysis, Granato et al. (1996) explored how cultural measures –in terms of values that reflect emphasis on autonomy and economic achievement vis-à-vis values that reflect emphasis on conformity to traditional social norms- can be used to examine the effect of achievement motivation on growth. Their results suggest that countries that put more emphasis on thrift and hard work rather than obedience and religious faith tend to enjoy high economic growth as compared to countries that emphasize obedience and religious faith. They conclude that cultural variables matter and achievement motivation is conducive to economic growth as it encourages relatively high rates of savings and investment.

Cultural values represent the implicitly and/or explicitly shared abstract ideas about what is good, right, and desirable in a society (Williams, 1970). Therefore, cultural values refer to a shared system of values that influence and shape an individual's behavior within the society. Cultural beliefs also influence societal organization and hence lead to diverse social patterns of economic interactions. In this regard, some beliefs and norms have been found to be inhospitable to markets or to engender mistrust, preventing them from building institutions that encourage trade and investment (North, 1994, 2005; Greif, 1994; Knack and Keefer, 1997). For example, using a game theoretic framework, Grief (1994) argued that 'individualist' as opposed to 'collectivist' cultural beliefs foster social institutions that encourage exchange, initiatives and motivation which in turn stimulate long term economic growth.

The observation that cultural values matter for economic growth raises interesting questions: *“What can a society do if part of its cultural values hinders economic growth?”*

Having identified dimensions of culture that promote economic growth- achievement motivation- how can societies cultivate their adoption? Attempting to answer these questions is crucial in facilitating the design of institutions and policies that seek to enhance economic development. This paper contributes to this discussion; our hypothesis is that education has systematic impacts on an individual's cultural values and fosters the cultivation of growth-promoting norms. The primary objective of this paper, therefore, is to investigate the determinants of individuals' cultural values, with a special focus on examining the effect of educational attainment on individuals' cultural values. To achieve this we undertake cross country individual-level quantitative analysis using the 2005 wave of the World Value Surveys (WVS) data.

The rest of the paper is organised as follows: section 2 provides a general discussion of the notion of cultural values and its relationship to education. Section 3 presents the econometric framework employed in the analysis while section 4 discusses the data used in the empirical estimation. In section 5 we present and discuss the results while section 6 concludes.

II. The link between Cultural Values and Education

Empirical research has demonstrated that culture can and does change (Granato et al., 1996; Jones, 2006). Moreover, cultural values are transmitted within and between generations and societies through technologies of communications, trading and immigration (Jones, 2006). Education, a form of communication which involves the exchange of ideas, represents an important transmission mechanism to influence cultural values that prevails within the society towards growth-promoting values. This notion is supported by Graff (1986) who postulate that literacy (a proxy for education), development and growth are inseparably linked such that literacy becomes one of the fundamental elements in the larger set of characteristics and processes that revolutionize a traditional, pre-modern world into the modern world. The importance of education in promoting economic development is also emphasized by Mungazi and Walker (1997), who conclude that Africans should recognize the importance of the educational institutional change as a pre-condition for development. This suggests that education can be used as a catalyst to shape cultural values consistent with Keefer and Knack (2005). They argue that education is associated with development-promoting norms, although the study did not empirically investigate this link, a gap this paper attempts to fill.

While culture is a factor that directly affects individual's behavior, researchers have generally been interested in cultural values at a national level (Inglehart, 1990; Granato et al., 1996; Schwartz, 1999; Inglehart and Baker, 2000). National boundaries, however, do not necessarily characterize peoples' cultural values as it may vary among the individuals of the same country. For example, Yoo and Donthu (2001) found that it is difficult to stereotype a person's cultural values simply based on his or her nationality and that there exist distinct sub-cultures across nations. In contrast to most previous studies, this paper focuses on the individual determinants of cultural values.

The foregoing discussion demonstrates that culture is dynamic and that certain cultural attributes promote economic growth, for example attributes pertaining to thrift and hard work. The discussion underscores the importance of empirically investigating factors that are conducive to adoption of these attributes. The subsequent sections undertake such an investigation, focusing on the role of education in facilitating the adoption of growth promoting cultural attributes. The following section begins the empirical analysis by presenting the econometric framework used in our analysis.

III. The Econometric Framework

It is presumed that a rational individual, i has an index function or latent variable, $CValues_i^*$, which is an ordinal measure of the importance the individual attaches to different aspects of culture. While this index is fully known to the respondent, it is unknown to others. This latent variable is assumed to be a linear combination of the individual's observed and unobserved socio-economic characteristics such that

$$CValues_i^* = \alpha_1 Education_i + \alpha_2 X_i + \varepsilon_i, \quad (1)$$

for $i = 1, \dots, N$. Our independent variable of interest is $Education_i$ which captures the level of formal education the individual has completed. Although formal education might not be the only form of education that might have significant impacts on an individual's cultural values, the difficulty of capturing an individual's informal education levels limits us from controlling for this. The vector X_i comprises socio-economic characteristics of the respondent, of which their inclusion is based on existing empirical literature and theory. The parameter and the vector of parameters to be estimated are α_1 and α_2 respectively. The error

term, ε_i is assumed to be independently, identically, and normally distributed with zero mean and standard deviation equal to one (Wooldridge, 2002) such that its cumulative distribution function is denoted by Φ . For model identification purposes, model (1) is to be estimated without an intercept.

Given that $CValues_i^*$ is not observable, the following model is estimated:

$$CValues_i = \alpha_1 Education_i + \alpha_2 X_i + \varepsilon_i, \quad (2)$$

where $CValues_i$ is the observed dependent variable. The underlying rationale with this formulation is that there is a latent continuous metric, $CValues_i^*$, supporting the ordinal responses observed by the researcher, $CValues_i$.

$CValues_i$ is used to capture the respondent's attitudes towards specific cultural values. As discussed in the preceding sections culture is viewed as a system of basic common values that help shape the behaviour of an individual. The most natural way to capture a person's cultural values is to infer what values they believe should be passed on to children or what values children should be encouraged to learn at home. The study follows this line of argument and base the construction of our dependent variable on the following question posed in the WVS: *'Here is a list of qualities which children can be encouraged to learn at home. Which if any, do you consider important?'* This list includes, among others, qualities that emphasize autonomy and economic achievement. These include qualities such as 'thrift, saving money and things' and 'determination'. The other values included emphasise conformity to traditional social norms such as 'obedience' and 'religious faith'.

In constructing the variable $CValues_i$ we adopt the approach of Granato et al. (1996). However while their analysis is at national level, our analysis is at the individual or respondent level. This allows us to analyze how cultural values at the personal level are influenced by education levels, also at the personal level. Thus the construction of the dependent variable is modified in line with the fact that the analysis is at individual level. We make use of four types of cultural values in the data, which are 'thrift, saving money and things', 'determination', 'obedience' and 'religious faith'. A dummy for each cultural value is constructed i.e. all dummy variables taking the value of one if the respondent mentions the quality as important and zero otherwise.

Consistent with Granato et al. (1996) we then construct the autonomy and economic achievement score .i.e. ‘thrift, saving money and things’ and ‘determination’ simply by adding up their respective dummies. This implies that an individual who believes in the importance of all both ‘thrift, saving money and things’ and ‘determination’ gets a score of 2, which is the maximum, and zero if they believe in neither of the two. Similarly a score of conformity to traditional norms is constructed i.e. ‘obedience’ and ‘religious faith’ simply by adding up their respective dummies. The next step is then to subtract the score on conformity to traditional norms from the autonomy and economic achievement score. This construction safeguards us from the problem that might arise in cases where respondents in some societies emphasize the importance of all these goals while respondents in other societies mention relatively few of them.

This means that our overall achievement motivation index can take five possible values. These are: -2 (when the respondent mentions both ‘obedience’ and ‘religious faith’ and none of the economic achievement values), -1 (when the respondent mentions either ‘obedience’ or ‘religious faith’ and none of the motivational values), 0 (which arises from three scenarios: when the respondent mentions none of the four values; or when the respondent mentions all of the four values; or when the respondent mentions either ‘obedience’ or ‘religious faith’ and either of the economic achievement values), 1 (when the respondent mentions either of the economic achievement values and neither ‘obedience’ nor ‘religious faith’), and 2 (when the respondent mentions both of the economic achievement values and neither ‘obedience’ nor ‘religious faith’).

To obtain $CValues_i$, we make the following intuitive arguments: a negative score on the index indicates that the respondent places more emphasis on conformity to traditional norms than on autonomy and economic achievement, in this case a score of one is recorded on the variable $CValues_i$. A score of zero on our achievement motivation index implies that the individual attaches a balanced importance to the two types of values and in this case the individual is assigned a score of two on the variable $CValues_i$. Finally a positive score on our achievement motivation index indicates that the respondent places more emphasis on autonomy and economic achievement than conformity to traditional norms, in this case the individual is assigned a score of three on the variable $CValues_i$. Consequently, our dependent variable $CValues_i$ takes the value of 1, 2 or 3. Implicit in this construction is an ordering that increases as more emphasis is placed on autonomy and economic achievement, in line with

existing literature that illustrated the importance of cultural values on economic growth and provided empirical support of the positive impact of emphasizing autonomy and economic achievement on economic growth. $CValues_i$ is ordered such that an increase in the index value indicates a higher importance being placed on autonomy and economic achievement.

$CValues_i$ is thus an observed discrete cultural values variable ordered as follows:

$$CValues_i = \begin{cases} 1 & \text{if the respondent emphasizes traditional norms} \\ 2 & \text{if the respondent emphasizes both (balanced)} \\ 3 & \text{if the respondent emphasizes autonomy and economic achievement} \end{cases} \quad (3)$$

Since $CValues_i^*$ is an ordinal index, it can be scaled so that a one-to-one correspondence would exist between $CValues_i^*$ and $CValues_i$. Accordingly we specify the following:

$$CValues_i^* = \begin{cases} 1 & \text{if } \mu_0 \leq CValues_i^* \leq \mu_1 \\ 2 & \text{if } \mu_1 < CValues_i^* \leq \mu_2 \\ 3 & \text{if } \mu_2 < CValues_i^* \leq \mu_3 \end{cases} \quad (4)$$

where the μ_j 's represent thresholds or arbitrary cut-off points in the individual's preference space such that $\mu_0 < \mu_1 < \mu_2 < \mu_3$. Larger cut-off points correspond to larger values of $CValues_i^*$. These cut-off points are to be estimated along with the parameters and the vector of parameters α_1 and α_2 , respectively. We adopt the additional notation that $\mu_0 = -\infty$ and $\mu_3 = +\infty$.

The assumption that the error term is independently, identically, and normally distributed with zero mean allows us to make probabilistic statements that relate the respondent's index on cultural values to selected independent variables. The probability of outcome $j \in \{1, 2, 3\}$ can be derived as

$$Pr(CValues_i = j) = \Phi(\mu_j - (\alpha_1 Education_i + \alpha_2 X_i)) - \Phi(\mu_{j-1} - (\alpha_1 Education_i + \alpha_2 X_i)), \quad (5)$$

with $\Phi(\mu_0 - (\alpha_1 Education_i + \alpha_2 X_i)) = 0$ and $\Phi(\mu_2 - (\alpha_1 Education_i + \alpha_2 X_i)) = 1$, for $j = 1$ if $CValues_i = 1$, $j = 2$ if $CValues_i = 2$ and $j = 3$ if $CValues_i = 3$. This specification represents the Ordered Probit (henceforth referred to as OP) model, which is the starting point of our estimation. $\Phi(\bullet)$ is assumed to be the cumulative distribution function of the standard normal

distribution. To estimate the model we use maximum likelihood under which the likelihood function is formulated by defining an indicator variable, z_{ij} which takes the value of one if $CValues_i = j$ and zero otherwise. The log-likelihood is thus:

$$\ln L = \sum_{i=1}^N \sum_{j=1}^3 z_{ij} \ln [\Phi_{ij} - \Phi_{i,j-1}], \quad (6)$$

where $\Phi_{ij} = \Phi(\mu_j - (\alpha_1 Education_i + \alpha_2 X_i))$ and $\Phi_{i,j-1} = \Phi(\mu_{j-1} - (\alpha_1 Education_i + \alpha_2 X_i))$.

The increasing nature of the ordered classes means that the interpretation of the model's parameter of primary interest α_1 , is as follows: positive signs indicate that the respondent is more likely to attach greater importance to autonomy and economic achievement as their education level increase, while negative signs suggest the converse.

Semi-nonparametric estimation

The OP model could be criticized for assuming that the error terms are normally distributed. When the assumptions of homoscedasticity and normality of the error terms are violated then OP estimates are generally inconsistent (Wooldridge, 2002). Hence, to control for heteroscedasticity, a robust estimation was performed. Further, to test for normality, the conditional moments test (Newey, 1985) was applied. Given the non-normality result, we consider a semi-nonparametric estimator — the Semi-Nonparametric Extension of Ordered Probit (henceforth referred to as SNEOP)⁴. The SNEOP relaxes the distributional assumption required by OP. The non-normality of the error terms is allowed through maximum likelihood estimation of a Hermite form approximation of the unknown density, which is the product of the square of an unknown polynomial multiplied by the normal density (Gallant and Nychka, 1987). The approximation is specified as follows:

$$F_K(\varepsilon) = \frac{1}{\theta} \left(\sum_{k=0}^K \gamma_k \varepsilon^k \right)^2 \phi(\varepsilon), \quad (7)$$

where $\phi(\varepsilon)$ is the standard normal density function and $\theta = \int_{-\infty}^{\infty} \left(\sum_{k=0}^K \gamma_k \varepsilon^k \right)^2 \phi(\varepsilon) d\varepsilon$.

⁴ The SNEOP is an extension of the OP model (for more details on the method see Stewart, 2004).

The associated cumulative distribution function, F , is:

$$F_K(z) = \frac{\int_{-\infty}^z \left(\sum_{k=0}^K \gamma_k \varepsilon^k \right)^2 \phi(\varepsilon) d\varepsilon}{\int_{-\infty}^{\infty} \left(\sum_{k=0}^K \gamma_k \varepsilon^k \right)^2 \phi(\varepsilon) d\varepsilon}, \quad (8)$$

where K is the order of the unknown polynomial, $\phi(z)$ is the standard normal density at z , and the γ_k s are the SNEOP coefficients. The semi-nonparametric distributions are thus defined for increasing values of K . An expansion around any density with a moment-generating function could be used in equation (8), but the normal is an ideal choice here so that the resulting model nests the OP, which corresponds to $K = 0$, $K = 1$ and $K = 2$. This means that the model with $K = 3$ is the first generalization of the OP model allowing for non-normality of the error terms.

Provided K increases with the sample size, the model parameters are estimated consistently by maximizing the pseudo-likelihood function obtained by replacing the normal distribution function in (6) by that in (8) (Gallant and Nychka, 1987). In practice, the decision on what K to use is based on statistical tests between alternative K 's implying that the model is treated as parametric for a given K , with the choice of K being part of the model selection procedure. After choosing K based on for example likelihood-ratio tests (Stewart, 2004) and setting μ_1 to its OP value for identification, the coefficients γ_k are estimated jointly with μ_2 , α_1 and α_2 by maximum likelihood. In estimating the SNEOP we use the program developed by Stewart (2004) for Stata. Our analysis is based on data presented in the following section.

IV. The Data and Descriptive Statistics

The individual-level data used in this paper are from the 2005 wave of the World Value Surveys covering 43 countries⁵. To be able to isolate the impact of education on cultural values, it is essential to control for the socio-economic characteristics of the respondent such as age, ethnicity and employment. This is necessitated by differences in national population demographic compositions within and across nations (Schwartz, 1999). Furthermore the socio-economic variables from the WVS data are augmented by country-level data on GDP

⁵ Andorra, Argentina, Australia, Brazil, Bulgaria, Burkina Faso, Chile, China, Cyprus, Egypt, Ethiopia, Finland, Germany, Ghana, India, Indonesia, Italy, Japan, Jordan, Malaysia, Mali, Mexico, Moldova, Morocco, Peru, Poland, Romania, Rwanda, South Africa, South Korea, Serbia, Slovenia, Spain, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, Turkey, Ukraine, United States of America, Vietnam and Zambia.

per capita and globalization indices, in order to control for the macro or country-specific effects on individuals' cultural values.⁶

Table 1 below gives descriptive and summary statistics of the variables used in our empirical analysis. The average score on the cultural values index is close to 2 indicating that on average, respondents tend to balance the emphasis they place on economic achievement motivation and traditional social norms. On average the surveyed respondent has completed secondary schooling (the mean for education level is 5). Christians represent 50% of respondents and around 72% of the respondents consider themselves religious. 53% of the respondents have paid employment and the mean of the income deciles reported by the surveyed households is 4.63.

⁶ Data on GDP per capita is obtained from the World Development Indicators online database for 2005. The overall globalization index is obtained from the Centre for the Study of Globalization and Regionalization (CSGR) at Warwick University, UK <http://www2.warwick.ac.uk/fac/soc/csgr/research/>. The overall Globalization Index is a normalized index based on economic, social, and political sub-indices that allows cross-country comparison of the degree of integration in the global economy over time.

Table 1: Descriptive Statistics

Variable	Description	Mean	Std. Deviation
<i>Dependent variable</i>			
Cvalues	Cultural values index	1.99	0.82
<i>Socioeconomic characteristics</i>			
Education ⁷	Highest education level attained by the respondent	5.08	2.53
Gender	Sex of the respondent (1=male and 0=female)	0.48	0.49
Age	Age of the respondent	41.45	16.4
Married	1 if respondent is married or living together with a partner, 0 otherwise	0.63	0.48
Children	Number of children the respondent has	1.95	1.86
Income ⁸	Income scale of the household	4.63	2.24
Employed	1 if respondent has paid employment, 0 otherwise	0.53	0.49
Media ⁹	Principal component index on media/sources of information used by the respondent in the last week	1.34	0.72
Religious	1 if respondent considers him/herself religious, 0 otherwise	0.72	0.45
Christianity	1 if respondent is Christian, 0 otherwise	0.50	0.49
Muslim	1 if respondent is Muslim, 0 otherwise	0.21	0.41
Other religions	1 if respondent follows other religions (e.g. traditional beliefs, Judaism, etc), 0 otherwise. Used as a reference religion variable.	0.29	0.45
Black	1 if respondent is Black, 0 otherwise	0.20	0.40
White	1 if respondent is White, 0 otherwise	0.31	0.46
Asian	1 if respondent is Asian, 0 otherwise	0.17	0.38
Other ethnicities	1 if respondent is from another ethnicity, 0 otherwise. Used as a reference ethnicity variable.	0.32	0.47
<i>Country level variables and continental dummies</i>			
GDP	GDP per capita/1000, in PPP (current international \$)	12.003	11.316
Globalization ¹⁰	Overall globalization index (2004)	0.47	0.179
Europe	1 if the respondent's country is in Europe, 0 otherwise	0.27	0.45
Africa	1 if the respondent's country is in Africa, 0 otherwise	0.27	0.44
Asia	1 if the respondent's country is in Asia, 0 otherwise	0.29	0.45
Latin America	1 if the respondent's country is in Latin America, 0 otherwise	0.12	0.33
Oceania	1 if the respondent's country is in Oceania, 0 otherwise	0.02	0.15
North America	1 if the respondent's country is in North America, 0 otherwise	0.02	0.14

⁷ This is categorized as follows: 1=No formal education, 2=Incomplete primary school, 3=Complete primary school, 4=Incomplete secondary school: technical/vocational type, 5=Complete secondary school: technical/vocational type, 6=Incomplete secondary: university-preparatory type, 7= Complete secondary: university-preparatory type, 8=Some university-level education, without degree, 9=University-level education, with degree.

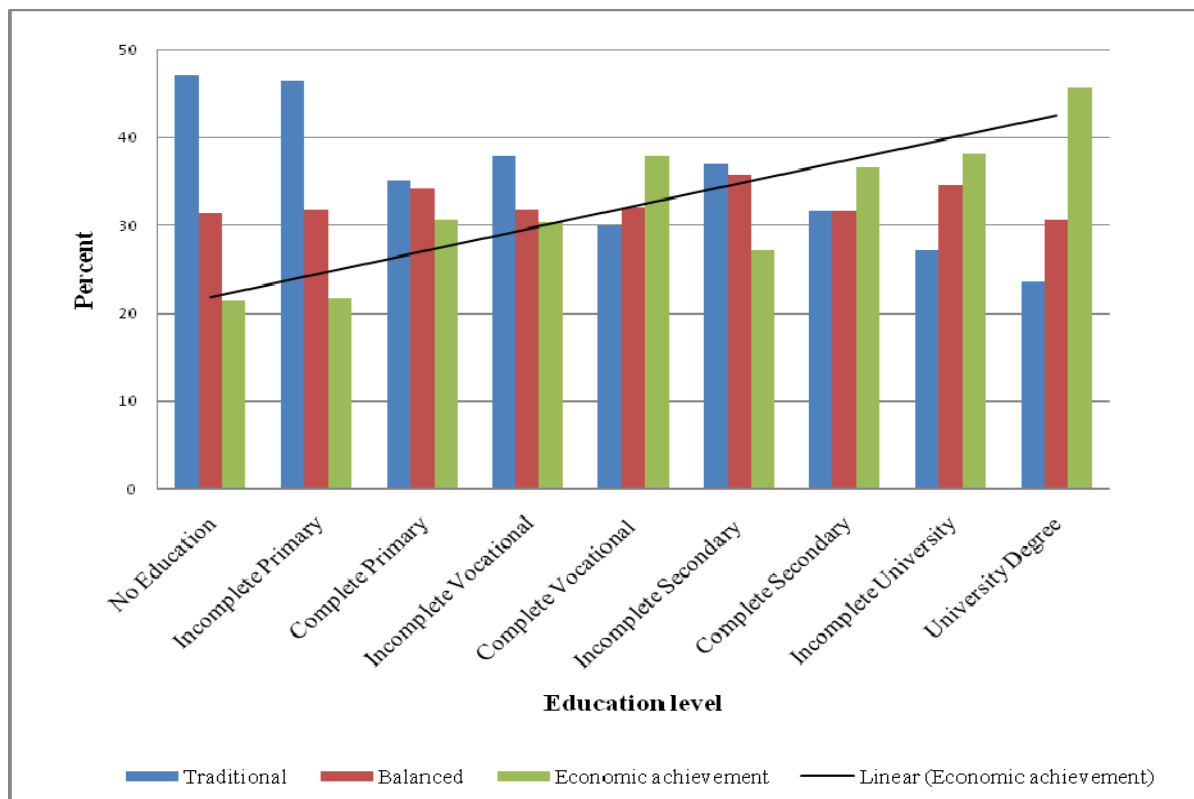
⁸ The scale is from 1 to 10 where 1= "lowest income decile" and 10 = "highest income decile in the country".

⁹ An aggregate index of Media is calculated using Principal Component Analysis. PCA is utilized to statistically weigh the different sources of information used by the respondent in the last week (these include daily newspapers, radio or TV, printed magazines, books, internet and/or talking with friends and colleagues).

¹⁰ A higher value of the index indicates that a country is more integrated in the global economy; zero implies no integration and one indicates full integration.

Figure 1 below presents cross tabulations of education and cultural values and illustrates that in general, emphasis on traditional norms falls as educational attainment increases, while emphasis on economic achievement increases with educational attainment. This is in line with our hypothesis that higher levels of education are associated with an increased emphasis on economic achievement. In the following section we test this link empirically and discuss the results.

Figure 1: Education and Cultural Values



V. The Results and Discussion

Table 2 below presents results from both the OP and SNEOP estimation of equation (2). The estimation of the two models is done in two steps: First we estimate the OP model for the cultural values index based on the individual-level data drawn only from the WVS data (model OP(1) in Table 2) followed by a second OP estimation in which the individual level data is augmented by country-level data (model OP(2) in Table 2). A similar estimation strategy is pursued for the SNEOP model (models SNEOP(1) and SNEOP(2) in Table 2). The rationale underlying our strategy here is not only to ensure robustness of the results but to allow for the possibility that country-specific effects might influence respondents’

perceptions of cultural values. The dependent variable in all estimations is *CValues* i.e. the index of cultural values considered important by the respondent.

The result on our variable of interest, *Education*, is robust across all estimations. Furthermore, similar directional effects are robust across all estimations for most explanatory variables. However, the ensuing discussion of results is based on the fourth model (SNEOP(2)). The reason for this is threefold: first the conditional moments test for the normality of the error terms (Newey, 1985) leads to a rejection of the null hypothesis at 1% level of significance. This implies that the OP estimates are inconsistent while SNEOP estimates are consistent and robust to distributional assumptions. Second, the likelihood-ratio tests reject the OP models in favor of SNEOP models at 1 percent significant level (see Table 2 below). Further, compared to the third model, (SNEOP(1)), the model has the advantage that it controls for country-level variables. Both SNEOP models are estimated with a polynomial of order three.

In addition to testing for normality of the error term in the OP model, we also tested for potential endogeneity of education using the Durbin–Wu–Hausman test which confirmed existence of endogeneity. In attempting to handle this problem we instrumented education with a country-level variable on public spending on education as a percentage of total government expenditure. The strategy involved running a first-stage regression on *Education* on the instrument together with all variables used in the analysis. The fitted values for *Education* retained from the first-stage were then used as an instrument for *Education* in the second-stage regression on *CValues*. The results confirmed that higher education levels are associated with an increased emphasis on economic achievement, verifying the robustness of this result. However, the weakness of this strategy, as in all cases of Instrumental Variable estimations, is that the result hinges entirely on finding suitable instruments i.e. instruments that are relevant and informative (Wooldridge, 2002). In this particular case it is even more difficult to find instruments for *Education* at an individual level. Moreover, country-level instruments always pose a problem for individual-level data as they might fail to capture the variation across individuals. Given these challenges, the Instrumental Variable estimations, which confirmed our hypothesized positive link between education and economic achievement values, are not reported.

Table 2: OPROBIT and Semi-Nonparametric Extended OPROBIT estimation of *CValues*

Variable	OP(1)		OP(2)		SNEOP(1)		SNEOP(2)	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
<i>Socio-economic characteristics</i>								
Education	0.018***	0.003	0.011***	0.003	0.016***	0.003	0.012***	0.003
Gender	-0.036***	0.011	-0.019	0.012	-0.029***	0.010	-0.018*	0.010
Age	0.007***	0.000	0.002***	0.000	0.006***	0.001	0.002***	0.000
Married	0.047***	0.013	0.014	0.013	0.037***	0.011	0.013	0.012
Children	-0.056***	0.004	-0.021***	0.004	-0.046***	0.005	-0.018***	0.004
Employed	0.070***	0.012	0.091***	0.012	0.059***	0.010	0.079***	0.012
Income	0.018***	0.003	0.016***	0.003	0.014***	0.002	0.013***	0.003
Media	0.107***	0.009	0.045***	0.010	0.089***	0.009	0.040***	0.009
Religious	-0.424***	0.013	-0.335***	0.014	-0.353***	0.026	-0.296***	0.023
Muslim	-0.767***	0.018	-0.678***	0.020	-0.648***	0.046	-0.607***	0.043
Christian	-0.290***	0.015	-0.296***	0.017	-0.240***	0.020	-0.256***	0.022
Black	-0.147***	0.017	0.149***	0.022	-0.136***	0.018	0.128***	0.021
White	0.154***	0.014	0.182***	0.017	0.125***	0.014	0.150***	0.017
Asian	0.386***	0.016	0.268***	0.020	0.321***	0.025	0.239***	0.024
<i>Country-level variables</i>								
GDP			0.009***	0.001			0.007***	0.001
Globalization			0.751***	0.052			0.674***	0.060
<i>Thresholds</i>								
μ_1	-0.417***	0.029	0.094	0.059	-0.417	Fixed	0.094	Fixed
μ_2	0.520***	0.029	1.063***	0.059	0.369***	0.052	0.959***	0.056
<i>SNEOP polynomial coefficients</i>								
γ_1					-0.109***	0.031	-0.062*	0.033
γ_2					-0.091**	0.037	-0.067*	0.038
γ_3					0.038***	0.010	0.038***	0.007
<i>CM test for normality</i>								
Chi2		45.354		82.063				
P-value		0.000		0.000				
<i>Likelihood ratio test of OP model against SNEOP extended model</i>								
Chi2						44.357		84.390
P-value						0.000		0.000
Wald chi2		8302.16		10539.24		226.76		243.78
Log pseudolikelihood		-45476.201		-42178.053		-45454.023		-42135.858
Number of observations		45424		43526		45424		43526

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Specifications OP(2) and SNEOP(2) control for continental dummies while both SNEOP(1) and SNEOP(2) are of polynomial of order 3.

The results show that education matters significantly for perceptions of cultural values. As people become more educated there is increased likelihood of placing more emphasis on

achievement motivation, as opposed to conforming to traditional social norms. This is consistent with our *a priori* hypothesis. The result is also consistent with Graff (1986) and Keefer and Knack (2005). Graff (1986) postulated literacy as one essential element that revolutionizes a traditional, pre-modern world into the modern world while Keefer and Knack's (2005) argued that education increases development-promoting norms.

We find evidence that suggests the importance of an individual's socio characteristics in determining cultural values. In particular our results reveal gender differences in perceptions of cultural values; men are more likely to conform to traditional norms than women. We also find evidence suggesting that as individuals grow older, they tend to put more emphasis on economic achievement than conform to traditional social norms. Furthermore the more children individuals have, the more emphasis they tend to place on traditional norms relative to economic achievement; this could be suggesting that individuals seek to pass their traditional norms on to their offspring.

Intuitively having formal employment implies increased exposure to other cultures (via interaction with colleagues, meaning that the positive effect of having paid employment could be capturing other channels of communication other than those captured by *Media*) and to an environment where achievement is a prerequisite for success. This means that having formal employment promotes values that stress economic achievement, in line with our result.

Shirley (2005) argued that norms, beliefs and similar institutions seem to be deeply engrained and the product of intractable factors, such as a society's history or its ethnic, religious, or linguistic heterogeneity. Similarly, our results suggest that religious beliefs matter for cultural values. Specifically we find that individuals who consider themselves religious tend to be inclined towards traditional values. This supports the postulate that a negative relationship exists between scientific advancement and religiosity at the level of individuals and groups (Marx, 1913; Weber, 1958; Lenski, 1963). Further, compared to other religions, both Christians and Muslims tend to emphasize conformity to traditional social norms. The result with respect to Muslims is in line with Guiso et.al (2002). However the result on Christianity contradicts their result which suggested that Christianity is positively associated with growth-promoting cultural values. In addition, our results indicate that, relative to other ethnic groups, Blacks, Whites and Asians are likely to put more emphasis on economic achievement than on conformity to traditional social norms.

The positive effect of media confirms the notion put forward by Shirley (2005) that changes in beliefs and norms usually require a period of gradual learning, and that education,

research and communication may speed adaption. Media, as an indicator of communication, can change or dampen traditional cultural values by, for example, allowing foreign or external beliefs to infiltrate the host traditional cultures. The result could be suggesting that the more an individual is exposed to other cultures through media the more likely the individual is to place more emphasis on achievement motivation than on traditional norms. This significant and positive impact of access to information or media on cultural values indicates that public policies aimed at improving access to information (as well as the quality of these sources) will likely help promote adoption of values that are considered important for economic development.

Interestingly, *ceteris paribus*, as countries become richer and more globalized there are tendencies for citizens to thrive for higher achievement. The positive relationship between GDP and culture aligns with findings by Swank (1996) and Granato et al., (1996). An increase in GDP levels is likely to be associated with increased emphasis on economic achievement which might translate to individuals putting more emphasis on values pertaining to autonomy and economic achievement. Consistent with this we find a positive and significant impact of the respondent's household's income on the achievement motivation.

Results show the positive impact of globalization on economic achievement values. A possible explanation is that globalization entails increased interaction with the global community since the main premise of globalization is that all countries pursue a common set of economic policies that emphasize free markets and trade, treating the world as one global economy. Thus, it facilitates the transfer of cultural values from one country to another and given the underpinnings of globalization (profit motivation, individualism and achievement orientation, etc) the values that are likely to be advanced are the ones that emphasize economic achievement.

VI. Conclusion

Empirical research has shown that cultural values matter for economic growth and has specifically identified the achievement motivation as an aspect of culture that engenders economic growth. This warrants a comprehensive understanding of factors that promote the economic achievement motivation. In this regard, the paper identifies systematic linkages between education and individuals' cultural values, with culture defined as a shared system of values that influence and shape individuals' behavior within the society. The paper specifically examines how education impacts relative importance an individual places on economic achievement vis-à-vis traditional social norms

The empirical results provide evidence that education matters for individuals' cultural values. In particular results indicate that as an individual becomes more educated there is increased likelihood of him/her placing more emphasis on values that emphasize autonomy and economic achievement, as opposed to conforming to traditional social norms. In addition we find that the more an individual is exposed to the media the more likely the individual is to place more emphasis on achievement motivating values than on traditional norms. Further, globalization is found to encourage the adoption of economic achievement values.

Our analysis has an important implication for efforts to promote cultural values that engender economic growth and development. The results highlight the role institutions and specifically public policy on education could play in encouraging people to adopt values that are considered important for economic development. Furthermore public policies aimed at improving access to information (as well as the quality of these sources) will help promote adoption of values that are considered important for economic development. These findings are especially important in countries experiencing poor economic development; by taking cognizance of the link between institutions and cultural values, particularly values pertaining to economic achievement. Institutions could be used as an integral part of efforts that seek to promote values favorable to economic growth. Interestingly, our results suggest that poor countries could benefit from globalization in as far as it helps facilitate the transfer of values that engender economic growth.

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