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The Impact of Institutions and Development on Happiness

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Abstract

This paper demonstrates that institutional factors influence the subjective well-being of individuals differently in rich versus poor countries. A lower level of corruption, a more democratic government and better civil rights increase the well-being of individuals in rich countries, whereas an increase in per capita income has no impact. On the contrary, in poor countries the extent of corruption, democracy and civil rights has no influence on happiness, but an increase in per capita income impacts happiness positively. This stark contrast may be due to the difference of preferences over income and institutional factors.

Keywords: *Economic Development; Happiness; Subjective Well-Being; Institutional Quality*

JEL Codes: *I31, D60, D73*

I. Introduction

Previous research has shown that institutional quality, economic growth and individual well-being are inter-related. For example, Rigobon and Rodrik (2005), Dollar and Kraay (2003), Acemoglu and Robinson (2000) and Hall and Jones (1999) suggest that improvements in institutional quality (such as property rights, or democracy) leads to economic development through increasing investment in human and physical capital. In addition, favorable institutional characteristics improve individuals' subjective well-being (Bjornskov, Dreher and Fischer, 2010; Frey and Stutzer, 2000; Veenhoven, 2000). However, the influence of economic development on subjective well-being is still debated. Some researchers, for example, Sacks, Stevenson and Wolfers (2010), argue that economic growth increases individuals' satisfaction with life. On the other hand, other researchers provide counter evidence. Most notably, Easterlin (1995), argue that individuals' happiness does not improve as their countries develop economically.

In this paper, using data on subjective well-being reports of over 200,000 individuals from 74 countries, we study the influence of economic development on individual happiness, and we identify a stylized fact. Specifically, we show that within already-rich countries, high economic development (GDP per capita) is correlated with individuals' happiness only if institutional characteristics (such as the extent of democracy, civil rights and corruption level) are not accounted for. On the other hand, within poor countries, high economic development (GDP per capita) increases individuals' happiness regardless of whether institutional characteristics are controlled for. Improvements in institutional quality of the country increase individuals' satisfaction with life only in rich countries.

We propose that a change in individual's preferences could be the reason for why the influence of economic development on happiness is eliminated in rich countries. The preferences

of individuals over favorable institutional characteristics and economic development may be different in rich versus poor countries. This can be better explained with an analogy that involves an individual who lives in a poor country (such as a developing country in Africa) and another who lives in a rich country (such as a European country). The poor individual is likely to value improvements in civil rights or democratization in his country *less* than the opportunities for, say, better nutrition and housing. As per capita GDP increases in his country, the poor individual's well-being will improve due to the pecuniary benefits of economic development. On the contrary, the rich individual is likely to value the non-pecuniary benefits of economic development more than the pecuniary benefits of economic development.

This idea is based on Maslow (1943)'s "hierarchy of needs" hypothesis. Specifically, Maslow argued needs has to be satisfied in a certain order. That is, an individual has to fulfill his primary needs (for example, physiological needs such as food and shelter) before he can pursue higher order needs (for example, belonging or esteem). In the context of the example above, the poor individual satisfies his primary needs with the pecuniary benefits of economic development. Later, when his basic needs are fulfilled, he will pursue higher order needs that are more related to non-pecuniary benefits of economic development.

The hypothesis of different preferences of individuals in rich versus poor countries is also consistent with the findings in both political science and economics research. For example, as put by Midlarsky (1992), people in both the ancient Athens and the industrial era England in the 18th century experienced high economic development together with improvements in civil rights due to pressures from the public. Furthermore, Schemeil (2000) discusses that ancient Egypt and Mesopotamia were among the most developed regions of their time, and at the same time their political systems involved public debate and voting. Moreover, in these countries, the individuals

had appeal rights and the leaders' policies were subject to questioning by opposing parties. Acemoglu et.al (2008), Barro (1999) and Acemoglu and Robinson (2000) report a correlation between high economic development and more democratic governments. Treisman (2000) and Mocan (2008) suggest that individuals in developing countries suffer from corruption more than do their counterparts in the developed countries. All of this evidence indicates that some institutional characteristics are common to more developed countries but not to their poor counterparts. This difference may be observed due to individuals' changing preferences over institutions and governance as the countries develop economically.

II. Data

The data set is obtained from the first four waves of World Values Survey, and it includes more than 200,000 individuals living in 74 different countries between years 1981 and 2002.[1,2] In some countries multiple surveys are held. The list of countries and their survey years are presented in Appendix Table 1. The outcome variable, the measure of individuals' subjective well-being, is based on the question "*All things considered, how satisfied are you with your life as a whole these days*?" Possible answers range from "Most dissatisfied" (represented by 1) and "Most satisfied" (represented by 10). This happiness measure is similar to those used by previous research (for example Di Tella and MacCulloch 2008, Oswald 1997).

Individual attributes as well as country characteristics are employed as control variables. Individual-level control variables include gender, age (and its square), income, education level,

[1] http://www.worldvaluessurvey.org/ World Values Survey provides a repeated cross-sectional data set.
[2] Only the countries for which the whole set of country-level variables could be obtained are include in the empirical analysis. See Table 1 for the full set of country-level variables.

employment and marital status and the number of children.[3] The source of all the individual-level variables is the World Values Survey. The country-level control variables used are GDP, inflation rate and unemployment rates, carbon dioxide emission per capita and the birth rate of the country. These controls are used to capture various aspects of the country, such as development level, pollution, and health condition of the overall population. They are obtained from various sources, such as World Bank's World Development Indicators, Penn World Tables and International Labour Organization's KILM Database. Descriptions and sources of the variables are provided in Table 1.

The key explanatory variables are *Low Corruption*, *Civil Rights* and *Democracy*. The corruption level in the country is measured by a variable constructed using the Transparency International's Corruption Perceptions Index. The constructed variable *Low Corruption* ranges between 0 (most corrupt) and 10 (least corrupt).[4] The variable *Civil Rights* is created based on Freedom House's Civil Liberties Index. Civil Liberties Index measures freedom of expression, assembly, association, and religion. The created variable *Civil Rights* takes values between 1 (least civil rights) to 7 (most civil rights).[5] From Polity IV, we obtained *Democracy* variable, which ranges between -10 and 10. While a -10 indicates the regime is an autocracy, a 10 means a democratic government is in the office.[6]

[3] In the regressions, we also include dummy variables for each of these categories that take the value of 1 when the information about an individual characteristic is missing. A considerable amount of the observations has missing *Income* and *Education* information (24% and 13%, respectively) in the data set. However, dropping such observations did not change our findings.

[4] This measures the perceived corruption among public officials and politicians. We constructed our corruption measure by using the average of the country's corruption score. Averaging does not constitute a problem, since it has been documented that corruption level in a country do not vary much over time (Mauro 1995 and Mocan 2008).

[5] This is an index that measures the real-world rights and freedoms enjoyed by individuals. For the very small amount of missing information from the source for some of the countries in our data set, we used the value in the index that is closest in time to the missing information for a country.

[6] Polity IV considers three essential elements: degree of competition in political participation, institutionalization of constraints on executive power and availability of civil liberties to citizens in their daily lives and political participation.

For the purposes of our study, we divided our sample into two parts: the rich and the poor countries. We employ the definition of World Bank which uses $11,500 GDP per capita as the threshold to separate the rich countries from the poor ones. Republic of Korea belongs to different categories in different years according to World Bank's definition. All of the remaining countries belong to either rich or poor group throughout all the survey years. The list of all the countries and whether they fall into rich or poor countries sample is provided in Appendix Table 1.

III. Individual Preferences on Institutional Quality

In this section, we investigate whether individual preferences over favorable institutional characteristics of their countries vary with individual's income and whether they live in a rich country. To test these hypotheses, we estimate the following specification using OLS:

(1) $Preference_{i,c,t} = f\{High\ Income_{i,c,t}, Rich\ Country_{c,t}, High\ Income_{i,c,t} \times Rich\ Country_{c,t}, Z_{i,c,t}, K_{c,t}\}$

where $Preference_{i,c,t}$ stands for individual i's preference over institutional characteristics of country c at year t. We consider several outcome variables. For example, *Prefers Rogue Leader* takes the value of one if the individual thinks having a strong leader who does not have to bother with parliament and elections is a good way of governing the country. *Prefers Army Rule* is an indicator for whether the individual believes having a strong leader who does not have to bother with parliament and elections is a good way of governing the country. *Prefers Democratic System* is a dummy for whether the individual thinks that having the army rule is a good way of governing the country. *Democracy is Better* takes the value of one if the individual agrees with "Democracy may have problems but it is better." *Belongs to Human Rights Group* and *Approves Human Rights Movement* denote whether the individual belongs to a human rights group and

whether the individual approves human rights movements. For the individuals who believe that accepting a bribe is not justifiable, *Bribe is Unjustifiable* takes the value of one.

High Income$_{i,c,t}$ in equation (1) is an indicator variable which takes the value of one if the individual is in the upper third portion of the personal income distribution in his country.[7] *Rich Country*$_{c,t}$ is equal to one if the individual lives in rich country. We also include the interaction of these two variables: *Income*$_{i,c,t}$ × *Rich Country*$_{c,t}$. Vectors $Z_{i,c,t}$ and $K_{c,t}$ include individual-level and country-level control variables.[8]

Results are presented in Table 2 which provides coefficients of the variables of interest and p-values of additional tests of coefficients. Specifically, the upper panel of Table 2 displays the regression coefficients of *High Income*$_{i,c,t}$, *Rich Country*$_{c,t}$ and *High Income*$_{i,c,t}$ × *Rich Country*$_{c,t}$. The lower panel of Table 2 shows the p-values of the null hypotheses listed. The first two tests allow us to investigate whether the individuals with high and low personal income differ in terms of their preferences over their countries' institutional characteristics in rich and poor countries. For example, the row with "H_0: $\frac{\partial Y(Rich\ Country=0)}{\partial High\ Income} = 0$" in the lower panel of Table 2 presents the p-value for the null hypothesis that the derivative of the outcome listed with respect to *High Income* for a poor country citizen (*Rich Country = 0*) is zero. In other words, we provide the p-value for the significance of the coefficient of *High Income* in the upper panel. In a similar fashion, the row with "H_0: $\frac{\partial Y(Rich\ Country=1)}{\partial High\ Income} = 0$" presents the p-value for the null hypothesis that the derivative of the outcome listed with respect to *High Income* for a rich

[7] Individuals are originally asked to report their incomes in ten brackets. We constructed the *High Income* variable by considering the individual's position in the income distribution of the country c and year t.
[8] Individual-level control variables are individual's gender, age, age-squared, education level, employment and marital status and the number of children the individual has. Country-level controls include the inflation rate and unemployment rates, carbon dioxide emission per capita and birth rate. See Table 1 and the Data section for more detailed descriptions of the variables used.

country citizen (*Rich Country = 1*) is zero. That is, we test whether the sum of the coefficients of *High Income* and *High Income* × *Rich Country* (coefficient in row C) is zero. Further, in the lower panel of Table 2, we include tests for whether the preferences of individuals who live in rich and poor countries are different conditional on having high or low personal income. In the "H_0: $\frac{\partial Y(High\ Income=0)}{\partial Rich\ Country} = 0$" and "$H_0$: $\frac{\partial Y(High\ Income=1)}{\partial Rich\ Country} = 0$" rows, the p-value for the null hypothesis that the derivative of the outcome listed with respect to *Rich Country* for an individual who is in the lower two third portion (*High Income = 0*) and the upper third portion (*High Income = 1*) of the personal income distribution in his country is zero, respectively.

Results in Table 2 indicate that both personal income and living in a rich country are statistically significantly associated with individuals' preferences on favorable institutional characteristics. For example, individuals with high personal income in poor countries are less likely to prefer an army rule and more likely to favor a democratic system compared to their low personal income counterparts in poor countries. Similarly, in rich countries, high income individuals are less likely to favor a rogue leader and think that bribing is unjustifiable. In addition, they are more likely to favor a democratic system and belong to human right groups.

Preferences of rich and poor country citizens over favorable institutional characteristics are significantly different from each other, as well. For example, regardless of their personal incomes, compared to poor country residents, citizens of rich countries are less likely to think a rogue leader or an army rule is good for running the country. They are more likely to favor a democratic system, to belong to human right groups and to think bribing is unjustifiable.

Although both personal income and whether the individual lives in a rich country are correlated with individuals' preferences over favorable institutional characteristics, the magnitudes differ vastly. For all outcomes we considered, *the influence of living in a rich*

country is much greater than that of having high personal income. For example, moving up to the upper third portion of the personal income distribution within the country reduces the probability of favoring a *Rogue Leader* by 2.4 percentage points in a rich country and does not have an influence in a poor country. On the other hand, moving an individual from a poor country to a rich country reduces his probability of favoring a *Rogue Leader* by about 20 percentage points, regardless of his personal income. This influence is about 10 times as large as the influence of attaining to a higher level of personal income. Similar patterns are observed for most other outcomes. The influence of living in a rich country is 3, 8 and 5 times as large as the influence of having a higher level of personal income for outcomes *Army Rule*, *Democratic System* and *Bribe Unjustifiable*. For the other outcomes the difference in the influences is not statistically significant.

IV. Influence of GDP per Capita and Institutional Factors on Life Satisfaction

Results of the previous section demonstrate that individuals in economically developed countries have a stronger preference for favorable institutional characteristics compared to the individuals who live in poor countries. Although existence of favorable institutional characteristics is correlated with economic development, there is still variation in institutions within rich and poor countries. For example, not all economically developed countries are run with well-established democracies. As a result, we expect the individuals who live in rich countries without favorable institutional characteristics to be less satisfied with their lives compared to their counterparts residing in rich countries with favorable institutional characteristics. Similarly, life satisfaction of the individuals who live in poor countries should

not be influenced by the institutional quality, since on average they do not have greater preference for the favorable institutional characteristics.

To test these hypotheses, we estimate the following specification following the previous work (Di Tella, McCulloch and Oswald 2003, Alesina, Di Tella and MacCulloch 2004, Blanchflower and Oswald 2008):

(2) $Satisfaction_{i,c,t} = f\{Z_{i,c,t}, K_{c,t}, GDP_{c,t}, S_{c,t}\}$

where $Satisfaction_{i,c,t}$ stands for the level of subjective well-being reported by the individual *i*, in country *c* in year *t*.[9] It is constructed based on the answers of the individuals to the question "*All things considered, how satisfied are you with your life as a whole these days?*" The per capita real income in country *c* in year *t* is denoted by $GDP_{c,t}$. Institutional variables, such as *Low Corruption*, *Civil Rights* and *Democracy* make up the vector $S_{c,t}$. The vectors $Z_{i,c,t}$ and $K_{c,t}$ include individual-level characteristics and country-level controls, respectively.[10] We estimate equation (2) over the samples of individuals from rich and poor countries separately using ordered probit.

The results of estimation of equation (2) are presented in Table 3, where we provide the coefficient estimates and the standard errors (in parentheses) of the variables of interest (*GDP per capita, Democracy, Low Corruption, Civil Rights*) in addition to the marginal effects [in brackets] of these variables for the highest life satisfaction category (10 – Most satisfied). The coefficient estimates of the whole set of covariates are presented in Appendix Table 2. The first three columns show the results when the institutional factors (*Democracy, Low Corruption, Civil*

[9] The answer is chosen from a scale between one and ten, with "Most dissatisfied" and "Most satisfied" are represented by 1 and 10, respectively. Details of the outcome variable are included in the Data section. We estimate equation (1) using an ordered probit model. Results do not change when OLS is used instead.

[10] Individual-level variables considered are individual's gender, age, income, education level, employment and marital status and the number of children the individual has. Country-level controls include the inflation rate and unemployment rates, carbon dioxide emission per capita and birth rate. See Table 1 and Data section for more detailed descriptions of the variables used.

Rights) are excluded from equation (2). Columns 4 to 6 display the results when all covariates are included.

Results in Table 3 suggest that favorable institutional characteristics influence the life satisfaction only for rich country residents. In addition, the positive influence of GDP per capita on happiness in rich countries is eliminated once institutions are controlled for in the regressions. Specifically, when democracy, civil rights and corruption in the country are not controlled for, GDP per capita has a positive impact on the probability of reporting the highest happiness category (most satisfied with life) in both rich and poor countries (columns 2 and 3). However, when democracy, civil rights and corruption are included in the regressions (columns 5 and 6), the impact of GDP per capita is eliminated in rich countries sample. A one standard deviation improvement in variables *Low Corruption*, *Civil Rights* and *Democracy* increase the probability of being in the most satisfied category by 4, 8 and 22 percentage points, respectively.

In poor countries, the probability of reporting the highest category of happiness increases with GDP per capita, but not with the institutional factors. An increase of $1,000 in GDP per capita in a poor country increases the probability that an individual is in the most satisfied category by 1.06 percentage points. Similar conclusions are reached when the marginal effects for the lowest life satisfaction category are considered.

V. Influence of Economic Growth and Institutional Factors on Life Satisfaction

In order to investigate the influence of the past economic growth, we estimate a variation of equation (2) depicted below:

(3) $Satisfaction_{i,c,t} = f\{Z_{i,c,t}, K_{c,t}, GDP_{c,t-k}, Growth_{c,t-k}, S_{c,t}\}$

where $Growth_{c,t-k}$ denotes the growth rate of the GDP per capita between years *t-k* and *t* in country *c*. We use 20 for *k*.[11] Employing large lags in equation (3), allows us to analyze whether economic growth over the last *k* years improves well-being, holding constant the current institutional factors and GDP per capita *k* years ago. Therefore, with this specification, we will be able to analyze differences in preferences over (a proxy for) living standards *k* years ago, growth in living standards and institutional characteristics of the countries between the individuals in rich and poor countries.

Equation (3) follows Di Tella and Mac Culloch (2008) who estimate a model in which average happiness level in rich and poor countries is a function of GDP per capita 45 years ago and the growth rate of GDP per capita during the last 45 years. They find that the average level of happiness in a poor country is determined by both past GDP per capita and GDP growth, but only the level of past GDP in a rich country impacts average happiness. They conclude that per capita GDP growth over some threshold level of GDP per capita (such as a level enough to satisfy basic needs) do not contribute to the happiness. We employ shorter lags than 45 years since using a 45-year lag reduces the sample size sharply.

Table 4 provides the results of estimation of equation (3) using GDP per capita 20 years ago and the economic growth in the last 20 years. In Table 4, we present the coefficient estimates and the standard errors (in parentheses) of the variables of interest in addition to the marginal effects [in brackets] of these variables for the highest life satisfaction category (10 – Most satisfied). Appendix Table 3 provides the coefficient estimates of the whole set of covariates.

Results in Table 4 are very similar to those in Table 3. The influence of democracy, civil rights and corruption on the probability of reporting highest well-being is positive and significant in rich countries sample. However, neither past levels of GDP per capita nor the growth in GDP

[11] Specifications that use 25 and 30 years of lag produce similar findings. Those results are available upon request.

per capita impact happiness in rich countries. On the other hand, the opposite is true in the sample of poor countries. Table 4 shows that a $1,000 increase in the GDP per capita 20 years ago in a poor country increases the probability of being in the most satisfied category by 2.2 percentage points. Democracy, civil rights and corruption do not significantly affect happiness for the individuals in poor countries.

VI. Summary and Conclusion

Using data on 200,000 individuals from 74 different countries, we find that (after controlling for commonly used determinants of happiness) institutional factors such as the extent of democracy, civil rights, and corruption have a systematic influence on reported well-being of individuals who live in *rich countries.* Per capita income has no effect. On the other hand, the happiness levels of the individuals living in *poor countries* are not affected by these institutional factors, but instead an increase in income per capita improves happiness. This may be evidence of a change in preferences over living standards (as proxied by GDP per capita) and favorable institutional characteristics as a country develops economically. Our results are in line with Frey and Stutzer (2000), who report that direct democratic institutions in Switzerland (one of the wealthiest countries in the world) contribute positively to the happiness of the Swiss; and with Bjornskov, Dreher and Fischer (2010) who show that institutional quality increases the average happiness in rich countries but not in poor countries.

We obtain the same results when we employ past GDP per capita and the GDP growth rate instead of the current GDP. In the countries that were already rich in the past, the happiness levels of the individuals do not improve as GDP per capita increases further over and above the past GDP per capita. In contrast, both economic development in the last decades and the level of

past GDP per capita have a positive impact on the happiness of the poor countries' residents. In other words, poor countries' residents enjoy the benefit of economic development and report greater happiness levels but they do not get happier as institutions improve (such as a more democratic government, better civil rights or less corruption). The results suggest, in line with Di Tella and MacCulloch (2008), that after a certain standard of living is reached, additional economic development does not improve happiness, but instead individuals favor a more democratic system with more civil rights and less corruption.

The reason for this stylized fact could be the difference in preferences of rich versus poor country residents. We provide evidence supporting this hypothesis. Specifically, compared to their counterparts in poor countries, rich country residents favor a more democratic system and more civil rights, and they disapprove corruption much more. Development level of the country where individual lives (whether the individual lives in a poor or rich country) is much more influential on preferences over preferences compared to the relative position of the individual in his country's personal income distribution.

Our hypothesis can explain Easterlin (1995)'s observation that in developed countries average happiness does not rise with increases in per capita GDP over time. Specifically, the developed world generally has not experienced sensational improvement in institutional quality in the last decades. However, they have developed economically continuously. If the residents of the developed world do not value increases in per capita GDP, as we argue in this paper, then it is not surprising to observe that the average happiness in these countries have not changed much over time.

Table 1
Descriptive Statistics, Definitions and Sources

		Whole Sample		Poor Countries		Rich Countries	
Variable	Descriptions and (Sources)	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Female	Dummy for females. (A)	0.517	0.500	0.510	0.500	0.527	0.499
Gender Missing	Dummy for missing gender information	0.001	0.027	0.001	0.023	0.001	0.031
Age	Individual's age, scaled by 0.1. (A)	4.131	1.625	3.949	1.536	4.399	1.713
Age Missing	Dummy for missing age information. (A)	0.006	0.079	0.008	0.091	0.003	0.057
Middle Income	Dummy that takes the value 1 if the individual is in the middle income group in his country. (A)	0.318	0.466	0.321	0.467	0.313	0.464
High Income	Dummy that takes the value 1 if the individual is in the upper income group in his country. (A)	0.257	0.437	0.264	0.441	0.248	0.432
Income Missing	Dummy for missing individual income information. (A)	0.130	0.337	0.102	0.302	0.172	0.378
Medium Education	Dummy that takes the value of one if the individual has completed secondary school. (A)	0.333	0.471	0.400	0.490	0.234	0.423
High Education	Dummy that takes the value of one if the individual has completed college partly or fully. (A)	0.157	0.364	0.178	0.382	0.128	0.334
Education Missing	Dummy for missing education information. (A)	0.237	0.425	0.098	0.298	0.440	0.496
Part-time worker	Dummy for part time working individual. (A)	0.072	0.259	0.064	0.245	0.084	0.277
Self Employed	Dummy for a self-employed individual. (A)	0.083	0.276	0.103	0.304	0.054	0.227
Retired	Dummy for a retired individual. (A)	0.139	0.346	0.113	0.316	0.178	0.382
Housewife	Dummy that takes the value 1 if the individual is dealing with home production. (A)	0.134	0.341	0.142	0.349	0.122	0.327
Student	Dummy for not working individual attending school. (A)	0.068	0.251	0.073	0.260	0.060	0.237
Unemployed	Dummy for an unemployed individual. (A)	0.079	0.270	0.097	0.296	0.053	0.224
Other work	Dummy for other types of individual employment status.	0.019	0.135	0.020	0.141	0.016	0.126
Employment Missing	Dummy for missing employment information. (A)	0.034	0.180	0.051	0.219	0.008	0.091
Married	Dummy that takes the value of 1 if the individual is married. (A)	0.584	0.493	0.583	0.493	0.584	0.493
Cohabiting	Dummy that takes the value of 1 if the individual is cohabiting with a partner. (A)	0.044	0.205	0.042	0.200	0.047	0.211

Table 1 Concluded

		Whole Sample		Poor Countries		Rich Countries	
Variable	Description	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Separated	Dummy that takes the value of 1 if the individual is divorced, separated or widowed. (A)	0.119	0.324	0.106	0.308	0.137	0.344
Marital Status Missing	Dummy for missing marital status information. (A)	0.021	0.144	0.033	0.179	0.004	0.061
1 Child	Dummy that takes the value of 1 if the individual has one child. (A)	0.157	0.364	0.159	0.366	0.155	0.361
2 Children	Dummy that takes the value of 1 if the individual has two children. (A)	0.264	0.441	0.248	0.432	0.289	0.453
3 Children	Dummy that takes the value of 1 if the individual has three children. (A)	0.137	0.343	0.135	0.342	0.139	0.346
4+ Children	Dummy that takes the value of 1 if the individual has more than three children. (A)	0.133	0.340	0.157	0.363	0.099	0.299
Children Missing	Dummy for missing children information. (A)	0.068	0.252	0.077	0.266	0.056	0.230
GDP per cap.	Real GDP per capita, scaled by 0.001. (B)	11.966	8.314	5.767	2.615	21.079	4.599
Inflation	The Inflation rate in the country. Calculated as the change in the Price Level of Gross Domestic Product (B)	0.003	0.123	-0.010	0.136	0.023	0.098
Unemployment Rate	The unemployment rate of the country. (C, D)	9.899	6.874	11.329	7.981	7.797	3.956
CO_2 Emission	Carbon dioxide emission per capita. (C)	0.593	0.414	0.713	0.481	0.417	0.175
Low Corruption	Corruption index, ranges from 1 to 10, 10 being the least corrupt. (E)	5.046	2.311	3.491	1.230	7.331	1.480
Civil Rights	The degree of civil liberties, 1 to 7, 7 being the most free. (F)	5.129	1.562	4.265	1.277	6.400	0.956
Democracy	Democracy-Autocracy index, -10 to 10, -10 for full autocracy and 10 for full democracy. (G)	6.411	5.168	4.418	5.370	9.341	3.024
Birth Rate	Number of births per 1,000 women in country. (C)	16.804	7.779	19.923	8.458	12.219	2.997
N		212948		126478		86470	

Sources: (A) World Values Survey, (B) Penn World Tables 6.2, (C) World Development Indictors, (D) International Labour Organization, (E) Transparency International, (F) Freedom House, (G) Polity IV.

Table 2
Individuals' Preferences on Institutional Quality

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Prefers Rogue Leader	Prefers Army Rule	Prefers Democratic System	Democracy is Better	Belongs to Human Rights Group	Approves Human Rights Movement	Bribe is Unjustifiable
A	High Income	-0.007	-0.030***	0.010*	0.015**	-0.003	-0.005	-0.011**
		(0.010)	(0.011)	(0.006)	(0.007)	(0.003)	(0.004)	(0.004)
B	Rich Country	-0.202***	-0.129***	0.080**	0.048	0.017	-0.001	0.052**
		(0.068)	(0.038)	(0.033)	(0.038)	(0.012)	(0.031)	(0.022)
C	High Income × Rich Country	-0.017	0.029***	0.000	-0.001	0.016***	0.012**	0.010*
		(0.013)	(0.010)	(0.009)	(0.009)	(0.005)	(0.005)	(0.005)
	Observations	118,530	117,965	118,738	110,916	100,609	40,379	177,883
	H_0: $\frac{\partial Y(Rich\ Country=0)}{\partial High\ Income} = 0$	-0.007 [0.508]	-0.030*** [0.008]	0.010* [0.092]	0.015** [0.030]	-0.003 [0.445]	-0.005 [0.236]	-0.011** [0.013]
	H_0: $\frac{\partial Y(Rich\ Country=1)}{\partial High\ Income} = 0$	-0.024*** [0.006]	-0.001 [0.995]	0.010* [0.079]	0.014*** [0.001]	0.013*** [0.000]	0.007*** [0.006]	-0.001 [0.677]
	H_0: $\frac{\partial Y(High\ Income=0)}{\partial Rich\ Country} = 0$	-0.202*** [0.004]	-0.129*** [0.001]	0.080** [0.016]	0.048 [0.207]	0.017 [0.150]	-0.001 [0.976]	0.052** [0.018]
	H_0: $\frac{\partial Y(High\ Income=1)}{\partial Rich\ Country} = 0$	-0.219*** [0.002]	-0.100*** [0.009]	0.080** [0.011]	0.047 [0.189]	0.033** [0.012]	0.011 [0.722]	0.062*** [0.005]

The outcome variables are listed at the top of the columns. The upper panel displays the regression coefficients from OLS. The lower panel shows the p-values of the null hypotheses listed. The row with "H_0: $\frac{\partial Y(Rich\ Country=0)}{\partial High\ Income} = 0$" presents the p-value for the null hypothesis that the derivative of the outcome listed with respect to *High Income* is zero for a poor country citizen. The row with "H_0: $\frac{\partial Y(Rich\ Country=1)}{\partial High\ Income} = 0$" presents the p-value for the null hypothesis that the derivative of the outcome listed with respect to *High Income* is zero for a rich country citizen. Similarly, the "H_0: $\frac{\partial Y(High\ Income=0)}{\partial Rich\ Country} = 0$" and "$H_0$: $\frac{\partial Y(High\ Income=1)}{\partial Rich\ Country} = 0$" rows present the p-value for the null hypothesis that the derivative of the outcome listed with respect to *Rich Country* for an individual who is in the lower two third portion (*High Income = 0*) and the upper third portion (*High Income = 1*) of the personal income distribution in his country is zero, respectively. All regressions include individual and country level control variables and year dummies. Standard errors are clustered at country-year level. ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively.

Table 3
Ordered Probit Estimates and Marginal Effects of Satisfaction with Life

	Whole Sample	Poor Sample	Rich Sample	Whole Sample	Poor Sample	Rich Sample
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per cap.	0.04***	0.07***	0.02**	0.02***	0.06***	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
	[0.72***]	[1.29***]	[0.36**]	[0.36***]	[1.06***]	[0.04]
Democracy				0.01	0.01	0.21***
				(0.01)	(0.01)	(0.03)
				[0.14]	[0.17]	[4.48***]
Civil Rights				0.01	-0.04	0.22***
				(0.04)	(0.04)	(0.05)
				[0.00]	[-0.64]	[5.00***]
Low Corruption				0.06***	0.04	0.08***
				(0.02)	(0.04)	(0.02)
				[1.24***]	[0.71]	[1.79***]
Observations	214,294	127,538	86,756	214,294	127,538	86,756

Dependent variable is the answer to the question "All things considered, how satisfied are you with your life as a whole these days?" scaled between 1 (most dissatisfied) to 10 (most satisfied). For each variable, the coefficients from the ordered probit estimation are presented as well as standard errors of the coefficients in (parentheses) and marginal effects for the highest life satisfaction category are presented in [brackets]. ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively. The sample used for the estimation is listed at the top of each column. All regressions include individual and country level control variables and year dummies. Standard errors are clustered at country-year level. See Table 2 for the descriptions of the variables. The full set of ordered probit coefficients is presented in the Appendix Table 2.

Table 4
Ordered Probit Estimates of Satisfaction with Life, Growth in last 20 years

	20 Year Lag		
	Whole Sample	Poor Sample	Rich Sample
	(1)	(2)	(3)
GDP per Capita Growth (t-20)	0.040	0.095***	-0.021
	(2.811)	(0.035)	(0.050)
	[0.924]	[2.197***]	[-0.485]
GDP per Capita (t-20)	0.032***	0.095***	0.008
	(0.010)	(0.029)	(0.014)
	[0.721***]	[2.207***]	[0.183]
Democracy	0.010	0.015	0.170***]
	(0.012)	(0.012)	(0.051)
	[0.238]	[0.348]	[3.857***]
Civil Rights	-0.021	-0.062	0.240***
	(0.039)	(0.046)	(0.048)
	[-0.470]	[-1.425]	[5.440***]
Low Corruption	0.027	-0.026	0.069***
	(0.022)	(0.035)	(0.021)
	[0.627]	[-0.606]	[1.575***]
Observations	166,213	87,625	78,588

Dependent variable is the answer to the question "All things considered, how satisfied are you with your life as a whole these days?" scaled between 1 (most dissatisfied) to 10 (most satisfied). For each variable, the coefficients from the ordered probit estimation are presented as well as standard errors of the coefficients in (parentheses) and marginal effects for the highest life satisfaction category are presented in [brackets]. ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively. The sample used for the estimation is listed at the top of each column. All regressions include individual and country level control variables and year dummies. Standard errors are clustered at country-year level. See Table 2 for the descriptions of the variables. The full set of ordered probit coefficients is presented in the Appendix Table 3.

References

Acemoglu, D. and J. Robinson. 2000. “Why Did the West Extend the Franchise? Democracy, Inequality, and Growth in Historical Perspective”, *Quarterly Journal of Economics* 115, pp. 1167-99.

Acemoglu, D., S. Johnson, J. Robinson and P. Yared. 2008. “Income and Democracy”, *American Economic Review* 98(3), pp. 808-42.

Alesina, A., Di Tella, R, and MacCulloch, R. 2004. “Inequality and Happiness: Are Europeans and Americans Different?”, *Journal of Public Economics* 88, pp.2009-42.

Barro, R. 1999. “Determinants of Democracy,” *Journal of Political Economy* 107(S6), pp.S158-S183.

Blanchflower, D. and Oswald, A. 2008. “Is Well-being U-shaped over the Life Cycle?” *Social Science and Medicine* 66(8), pp. 1733-1749.

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

Di Tella, R. and R. MacCulloch. 2008. “Happiness Adaptation to Income beyond Basic Needs,” *NBER Working Paper* no.14539.

Di Tella, R., R. MacCulloch and A. Oswald. 2003. “The Macroeconomics of Happiness”, *The Review of Economics and Statistics* 85(4), pp.809-27.

Dollar, D. and A. Kraay. 2003. "Institutions, Trade, and Growth," *Journal of Monetary Economics* 50(1), pp. 133-162.

Easterlin, R. 1995. “Will Raising the Incomes Of All Increase The Happiness Of All?,” *Journal of Economic Behavior and Organization* 27(1), pp. 35-47.

Frey, B. and A. Stutzer. 2000. "Happiness, Economy and Institutions," *Economic Journal* 110(466), pp. 918-38.

Hall, R. and C. Jones. 1999. "Why Do Some Countries Produce So Much More Output Per Worker Than Others?," *The Quarterly Journal of Economics* 114(1), pp. 83-116.

Mauro, P. 1995. “Corruption and Growth,” *The Quarterly Journal of Economics* 110, pp. 681–712.

Maslow, A. 1943. “A Theory of Human Motivation,” *Psychological Review* 50(4), pp. 370-96.

Midlarsky M. 1992. “The Origins of Democracy in Agrarian Society: Land Inequality and Political Rights,” *The Journal of Conflict Resolution* 36(3), pp. 454-77.

Mocan, N. 2008. “What Determines Corruption? International Evidence from Micro Data,” *Economic Inquiry* 46(4), pp.493-510.

Oswald, A. 1997. “Happiness and Economic Performance,” *Economic Journal* 107(445), pp.1815-31.

Rigobon, R, and D. Rodrik. 2005. "Rule of Law, Democracy, Openness, and Income," *The Economics of Transition* 13(3), pp. 533-564.

Sacks D., B. Stevenson and J. Wolfers. 2010. "Subjective Well-Being, Income, Economic Development and Growth," *NBER Working Papers* No. 16441.

Schemeil, Yves. 2000. “Democracy Before Democracy?,” *International Political Science Review* 21(2), pp.99-120.

Treisman. 2000. “The Causes Of Corruption: A Cross-National Study”. *Journal of Public Economics* 76 (3), pp. 399-457.

Veenhoven, Ruut. 2000. "Freedom and Happiness: A Comparative Study in Forty-four Nations in the Early 1990s," in Culture and Subjective Well Being. Ed Diener and Eunkook M. Suh, eds., Cambridge, MA: MIT Press, pp. 257-88.

Appendix Table 1
Countries and Years Covered in the Empirical Analysis

Australia	1995	Rich
Albania	1998, 2002	Poor
Algeria	2002	Poor
Argentina	1984, 1995	Poor
Armenia	1997	Poor
Austria	1990, 1999	Rich
Azerbaijan	1997	Poor
Bangladesh	1996, 2002	Poor
Belarus	1996, 2000	Poor
Belgium	1990, 1999	Rich
Bosnia and Herzegovina	1998	Poor
Brazil	1991, 1997	Poor
Bulgaria	1997, 1999	Poor
Canada	1982, 1990, 2000	Rich
Chile	1990, 1996, 2000	Poor
China	1990, 1995, 2001	Poor
Colombia	1997, 1998	Poor
Croatia	1996, 1999	Poor
Czech Rep	1991, 1998, 1999	Rich
Denmark	1990, 1999	Rich
Dominican Rep	1996	Poor
Egypt	2000	Poor
El Salvador	1999	Poor
Estonia	1996, 1999	Poor
Finland	1990, 1996, 2000	Rich
France	1990, 1999	Rich
Georgia	1996	Poor
Germany	1990, 1997, 1999	Rich
Greece	1999	Rich
Hungary	1991, 1998, 1999	Poor
India	1990, 1995, 2001	Poor
Indonesia	2001	Poor
Iran, Islamic Rep	2000	Poor
Ireland	1990, 1999	Rich
Israel	2001	Rich
Italy	1990, 1999	Rich
Japan	1990, 1995, 2000	Rich
Jordan	2001	Poor
Korea, Rep	2001	Rich
Korea, Rep	1982, 1990	Poor

Appendix Table 1 Concluded

Latvia	1996, 1999	Poor
Lithuania	1997, 1999	Poor
Macedonia, FYR	1998, 2001	Poor
Mexico	1990, 1996, 2000	Poor
Moldova, Rep	1996, 2002	Poor
Morocco	2001	Poor
Netherlands	1990, 1999	Rich
New Zealand	1998	Rich
Nigeria	2000	Poor
Norway	1982, 1990, 1996	Rich
Pakistan	2001	Poor
Peru	1996, 2001	Poor
Philippines	1996, 2001	Poor
Poland	1990, 1997, 1999	Poor
Portugal	1990, 1999	Rich
Romania	1993, 1998, 1999	Poor
Russian Federation	1995, 1999	Poor
Saudi Arabia	2003	Rich
Singapore	2002	Rich
Slovakia	1990, 1991, 1998, 1999	Poor
Slovenia	1992, 1995, 1999	Rich
South Africa	1990, 1996, 2001	Poor
Spain	1990, 1995, 1999	Rich
Spain	2000	Rich
Sweden	1982, 1990, 1996, 1999	Rich
Switzerland	1989, 1996	Rich
Tanzania	2001	Poor
Turkey	1990, 1996, 2001	Poor
Uganda	2001	Poor
Ukraine	1996, 1999	Poor
United Kingdom	1990, 1998, 1999	Rich
United States	1982, 1990, 1995, 1999	Rich
Uruguay	1996	Poor
Venezuela	1996, 2000	Poor
Viet Nam	2001	Poor

Appendix Table 2
Ordered Probit Estimates of Satisfaction with Life

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole Sample	Poor Countries	Rich Countries	Whole Sample	Poor Countries	Rich Countries
Variables of Interest						
GDP per cap.	0.037***	0.070***	0.016**	0.019***	0.058***	0.002
	(0.004)	(0.013)	(0.008)	(0.006)	(0.020)	(0.007)
Democracy				0.007	0.009	0.202***
				(0.009)	(0.009)	(0.033)
Civil Rights				0.0001	-0.035	0.226***
				(0.036)	(0.040)	(0.045)
Low Corruption				0.064***	0.039	0.081***
				(0.023)	(0.037)	(0.020)
Individual Level Control Variables						
Female	0.027**	0.010	0.060***	0.026**	0.012	0.058***
	(0.011)	(0.014)	(0.011)	(0.011)	(0.014)	(0.011)
Age	-0.271***	-0.238***	-0.281***	-0.271***	-0.234***	-0.291***
	(0.022)	(0.029)	(0.023)	(0.022)	(0.030)	(0.023)
Age^2	0.029***	0.025***	0.031***	0.029***	0.024***	0.032***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
Medium Income	0.200***	0.222***	0.152***	0.200***	0.220***	0.150***
	(0.019)	(0.027)	(0.014)	(0.019)	(0.027)	(0.014)
High Income	0.353***	0.404***	0.246***	0.349***	0.403***	0.246***
	(0.030)	(0.043)	(0.023)	(0.030)	(0.043)	(0.021)
Medium Education	0.038	0.043	0.048	0.050**	0.051*	0.052**
	(0.024)	(0.030)	(0.030)	(0.022)	(0.028)	(0.026)
High Education	0.118***	0.147***	0.074**	0.133***	0.155***	0.083**
	(0.028)	(0.035)	(0.034)	(0.026)	(0.031)	(0.034)
Married	0.127***	0.091***	0.256***	0.130***	0.090***	0.257***
	(0.024)	(0.027)	(0.024)	(0.026)	(0.028)	(0.023)
Cohabiting	0.147***	0.159**	0.175***	0.135***	0.163**	0.144***
	(0.043)	(0.066)	(0.037)	(0.048)	(0.067)	(0.031)
Separated	-0.129***	-0.134***	-0.095***	-0.127***	-0.130***	-0.101***
	(0.021)	(0.026)	(0.024)	(0.022)	(0.026)	(0.022)
Part-time work	-0.003	0.023	-0.038	-0.002	0.021	-0.033
	(0.0176)	(0.0241)	(0.0232)	(0.0172)	(0.0231)	(0.0226)
Self-employed	0.034	0.056**	0.020	0.040*	0.054**	0.023
	(0.022)	(0.026)	(0.025)	(0.022)	(0.025)	(0.022)
Retired	-0.049**	-0.124***	0.017	-0.048**	-0.124***	0.019
	(0.022)	(0.029)	(0.027)	(0.022)	(0.029)	(0.024)
Housewife	0.051*	0.093**	-0.037	0.055**	0.086**	-0.031
	(0.027)	(0.039)	(0.023)	(0.027)	(0.038)	(0.020)
Student	-0.001	0.004	0.005	-0.005	0.001	-0.004
	(0.026)	(0.035)	(0.022)	(0.028)	(0.034)	(0.019)
Unemployed	-0.281***	-0.244***	-0.393***	-0.287***	-0.247***	-0.404***
	(0.024)	(0.029)	(0.036)	(0.023)	(0.028)	(0.036)

Appendix Table 2 Concluded

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole Sample	Poor Countries	Rich Countries	Whole Sample	Poor Countries	Rich Countries
Other Employed	-0.038	0.046	-0.122***	-0.025	0.047	-0.127***
	(0.049)	(0.068)	(0.040)	(0.053)	(0.071)	(0.038)
1 Child	-0.0260	-0.043**	-0.047**	-0.030*	-0.047**	-0.047**
	(0.017)	(0.022)	(0.022)	(0.018)	(0.022)	(0.022)
2 Children	-0.025	-0.044**	-0.040	-0.029	-0.047**	-0.045*
	(0.020)	(0.022)	(0.025)	(0.019)	(0.022)	(0.024)
3 Children	-0.002	-0.013	-0.017	-0.007	-0.017	-0.027
	(0.020)	(0.024)	(0.027)	(0.020)	(0.025)	(0.027)
4+ Children	0.050**	0.045	0.033	0.047*	0.042	0.014
	(0.024)	(0.029)	(0.033)	(0.025)	(0.028)	(0.032)
Other Country Level Control Variables						
Inflation	-0.315	-0.240	-0.223	-0.229	-0.177	0.037
	(0.249)	(0.287)	(0.518)	(0.236)	(0.276)	(0.448)
Unemployment Rate	-0.004	-0.007*	-0.002	-0.006	-0.007*	0.003
	(0.004)	(0.004)	(0.006)	(0.004)	(0.004)	(0.006)
CO_2 Emission	-0.205***	-0.130**	-0.099	-0.209***	-0.149**	-0.030
	(0.064)	(0.055)	(0.193)	(0.064)	(0.060)	(0.121)
Birth Rate	0.026***	0.029***	0.046***	0.026***	0.028***	0.018
	(0.005)	(0.007)	(0.017)	(0.005)	(0.007)	(0.015)
Observations	214,294	127,538	86,756	214,294	127,538	86,756

Dependent variable is the answer to the question "All things considered, how satisfied are you with your life as a whole these days?" scaled between 1 (most dissatisfied) to 10 (most satisfied). ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively. The sample used for the estimation is listed at the top of each column. Marginal effects for the variables of interest are listed in Table 3. All regressions include year dummies. Standard errors are clustered at country-year level. See Table 2 for the descriptions of the variables.

Appendix Table 3
Ordered Probit Estimates of Satisfaction with Life, Growth in the last 20 years

	(1)	(2)	(3)
	Whole Sample	Poor Countries	Rich Countries
Variables of Interest			
GDP per capita Growth (t-20)	4.038	9.483***	-2.135
	(2.811)	(3.535)	(4.965)
GDP per capita (t-20)	0.000***	0.000***	0.000
	(0.000)	(0.000)	(0.000)
Democracy	0.010	0.015	0.170***
	(0.012)	(0.012)	(0.051)
Civil Rights	-0.021	-0.061	0.240***
	(0.039)	(0.046)	(0.048)
Low Corruption	0.027	-0.026	0.069***
	(0.022)	(0.035)	(0.021)
Individual Level Control Variables			
Female	0.046***	0.037**	0.057***
	(0.011)	(0.017)	(0.012)
Age	-0.245***	-0.198***	-0.277***
	(0.023)	(0.034)	(0.023)
Age^2	0.028***	0.023***	0.030***
	(0.002)	(0.004)	(0.002)
Medium Income	0.196***	0.218***	0.152***
	(0.020)	(0.030)	(0.014)
High Income	0.325***	0.372***	0.241***
	(0.033)	(0.050)	(0.022)
Medium Education	0.064***	0.079***	0.029
	(0.022)	(0.030)	(0.028)
High Education	0.123***	0.163***	0.050
	(0.029)	(0.040)	(0.035)
Married	0.137***	0.093***	0.260***
	(0.027)	(0.030)	(0.024)
Cohabiting	0.146***	0.145***	0.150***
	(0.043)	(0.055)	(0.033)
Separated	-0.108***	-0.095***	-0.102***
	(0.023)	(0.028)	(0.023)
Part-time work	-0.016	-0.006	-0.034
	(0.018)	(0.024)	(0.023)
Self-employed	0.027	0.035	0.022
	(0.021)	(0.024)	(0.023)
Retired	-0.033	-0.130***	0.015
	(0.025)	(0.037)	(0.026)
Housewife	0.032	0.067**	-0.030
	(0.024)	(0.031)	(0.020)
Student	-0.033	-0.032	-0.010
	(0.030)	(0.036)	(0.021)

Appendix Table 3 Concluded

	(1)	(2)	(3)
	Whole Sample	Poor Countries	Rich Countries
Unemployed	-0.299***	-0.256***	-0.402***
	(0.028)	(0.034)	(0.040)
Other Employed	-0.124***	-0.080**	-0.138***
	(0.032)	(0.036)	(0.041)
1 Child	-0.018	-0.027	-0.045**
	(0.017)	(0.021)	(0.021)
2 Children	-0.014	-0.033	-0.042*
	(0.021)	(0.022)	(0.023)
3 Children	-0.001	-0.029	-0.017
	(0.021)	(0.026)	(0.026)
4+ Children	0.037	0.017	0.025
	(0.026)	(0.029)	(0.031)
Other Country Level Control Variables			
Inflation	0.035	0.014	0.246
	(0.366)	(0.452)	(0.501)
Unemployment Rate	0.001	0.008	0.001
	(0.007)	(0.010)	(0.008)
CO_2 Emission	-0.080	-0.222	-0.069
	(0.146)	(0.165)	(0.130)
Birth Rate	0.015**	0.014	0.018
	(0.007)	(0.010)	(0.014)
Observations	166,213	87,625	78,588

Dependent variable is the answer to the question "All things considered, how satisfied are you with your life as a whole these days?" scaled between 1 (most dissatisfied) to 10 (most satisfied). ***, ** and * indicate significance at 1%, 5% and 10% levels, respectively. The sample used for the estimation is listed at the top of each column. Marginal effects obtained from these coefficients are listed in Table 4. All regressions include individual level control variables and year dummies. Standard errors are clustered at country-year level. See Table 2 for the descriptions of the variables.