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# Rule of Law, Development, and Human Capabilities

Peter Boettke & J. Robert Subrick\*

*This paper examines the impact of the rule of law on human capabilities. Amartya Sen has argued and provided evidence that improvements in economic development do not necessarily lead to human capabilities. Human capabilities are defined as non-monetary factors that improve well-being such as life expectancy, infant mortality, malnutrition, environmental factors, and education. We estimate the impact of the rule of law on human capabilities by using an instrumental variables approach. We instrument the level of development with an index for the rule of law. There is little theoretical reason to expect the rule of law to directly impact human capabilities. We then use the predicted values of development to determine if the economic development is positively correlated with human capabilities. We find that there is a positive relationship between and most measures of human capabilities. We find no such relationship when examining environmental factors that is likely the result of the small number of observations.*

## I. INTRODUCTION

Critics of economics and political economy often argue that the discipline artificially restricts our imaginations regarding what matters for individuals. Martha Nussbaum, for example, argues that aggre-

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gate notions of well-being contained in figures such as a Gross Domestic Product (GDP) per capita are seriously flawed.<sup>1</sup> These figures fail to capture what is most important to living a meaningful life. She insists that we need to find better ways to measure the quality of life. She proposes that we move beyond strictly monetary considerations and include those non-monetary factors that are important for human life in our deliberations over human welfare. For example, she suggests we look at “life expectancy, infant mortality, educational opportunities, employment opportunities, political liberties, and the quality of race and gender relations.”<sup>2</sup> The reason is that these basic goods are “not well correlated with wealth and income.”<sup>3</sup>

Amartya Sen, in near agreement with Nussbaum, makes persuasive arguments that we must adopt broader goals for development than growth rates in per capita income.<sup>4</sup> In particular, Sen argues that we must concentrate on increasing human capabilities. By this he means expanding the ability of individuals to lead the sort of lives that they value. Wealth is an enabling factor and thus necessary, but it is not sufficient for explaining human progress. Development is a process of expanding the real freedoms of a people. This process requires removing the sources of un-freedom that include poverty, tyranny, and restricted opportunities (both economic and political). Good health, educational opportunity, increased life expectancy, democratic decision-making, and toleration of alternative life-styles are all important components of human well-being that are unfortunately left out of traditional economic measures of human welfare. We must expand our measures of well-being beyond income per capita, Sen argues, to include these factors if we want our work to have relevance to the dialogue on the human condition.<sup>5</sup>

We do not disagree with either Nussbaum or Sen on the shortcomings of the preoccupation with per capita GDP calculations. However, we believe there is a general pattern to be found between the adoption of the institutions that promote the wealth of a nation and the health and well-being of its people. In other words, life expectancy, infant mortality, educational opportunities, and health outcomes are well correlated with GDP. Our compassion is not truncated by the teachings of economics, as Nussbaum suggests, but instead that compassion is redirected toward an appreciation of the institutional pre-conditions which provide individuals with the material means

<sup>1</sup> Martha Nussbaum, *Women and Human Development: The Capabilities Approach* (Cambridge U Press, 2000).

<sup>2</sup> *Id.* at 61.

<sup>3</sup> *Id.*

<sup>4</sup> Amartya Sen, *Development as Freedom* (Knopf, 1999).

<sup>5</sup> *Id.*

which enable them to rise up and realize their potential as human beings. That is, we believe that the expansion of human capabilities is best understood to be the result of an institutional framework that encourages wealth creation.

We recognize that statistical correlation is *not* causation. We have, however, “good reasons” to argue that a country that is pursuing policies which protect private property rights and freedom of contract, promote open international trade, and engage in monetary responsibility and fiscal restraint will experience better economic growth than countries that do not follow this policy path.<sup>6</sup> Furthermore, countries that have attained higher levels of economic development tend to provide more of the things Nussbaum and Sen argue are required to live a meaningful life. In other words, the adoption of an institutional framework, which includes the rule of law, promotes economic development and improves the capabilities of individuals.

For this study, we want to examine the impact that the rule of law has on economic development, and explore the relationship between economic development and human capabilities. Our first conjecture is that the rule of law is a significant factor in explaining economic development. This is hardly controversial.<sup>7</sup> We believe this to be so because the rule of law provides us with the stability and predictability in economic affairs required for agents to engage in entrepreneurial action—both in terms of exploiting existing opportunities for profit through arbitrage and the discovery of new profit opportunities through innovation.<sup>8</sup> Absent the security and predictability provided by a rule of law, economic actors will shorten their time horizon of investment and economic progress will be thwarted. As Hayek pointed out: “The classical argument for freedom in economic affairs rests on the tacit postulate that the rule of law should govern policy in this as in all other spheres.”<sup>9</sup> Economic policies not in conformity with a rule of law introduce discretionary and *ad hoc* decisions that undermine the predictability and stability in the economic environment. A policy environment consistent with the rule of law, on the other

<sup>6</sup> Mancur Olson, *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships* (Basic Books, 2000); Deepak Lal, *Unintended Consequences: The Impact of Factor Endowments, Culture, and Politics on Long-Run Economic Performance* (MIT Press, 1998); Douglass North, *Institutions, Institutional Change, and Economic Performance* (Cambridge U Press, 1990).

<sup>7</sup> Robert Barro, *Determinants of Economic Growth: A Cross-Country Empirical Study* (MIT Press, 1997).

<sup>8</sup> See F.A. Hayek, *The Constitution of Liberty* 133, 133-249 (U of Chicago Press, 1960); F.A. Hayek, *The Road to Serfdom* 72, 72-87 (U of Chicago Press, 1944); Mario Rizzo, *Law Amid Flux*, 9 J of Legal Stud 291, 291-318 (1980); Richard Epstein, *Simple Rules for a Complex World* (Harv U Press, 1995).

<sup>9</sup> Hayek, *The Constitution of Liberty* at 220 [cited in note 8].

hand, leads to an enhanced ability by economic actors to predict the behavior of others with whom they must coordinate their plans. Empirical studies by Barro and Sala-i-Martin support our first conjecture that the rule of law is a significant factor contributing to economic development.<sup>10</sup>

Our second conjecture is that economic development is a significant factor in determining increases in what Sen entitles human capabilities. Human well-being, or “flourishing,” is a function of individuals being able to live peaceful and meaningful lives.<sup>11</sup> Health and happiness are subjective concepts and are probably impossible to measure accurately given the elastic nature of the concepts through time and space. However, there are some objective measures that we propose to examine in light of our conjecture about the relationship between the level of development and human capabilities. Life-expectancy, literacy rates, educational opportunities, malnutrition, pollution and other indicators serves as use useful proxies for human capabilities.

In short, we expect that the rule of law will increase the level of development, and the level of development will lead to improvements in human capabilities. That is, the rule of law is an institutional feature that promotes economic development that, in turn, leads to increases in those capabilities that Nussbaum and Sen argue are necessary for living a human life. Economic development, in short, provides the material pre-requisites that enable human flourishing.

## II. WHY IS THE RULE OF LAW RELEVANT FOR ECONOMIC GROWTH

Our understanding of the relationship between the rule of law and economic growth derives mainly from the writings of F.A. Hayek.<sup>12</sup> Hayek argued that the rule of law “means that government in all its actions is bound by rules fixed and announced beforehand—rules which make it possible to foresee with fair certainty how the authority will use its coercive powers in given circumstances and to plan one’s individual affairs on the basis of this knowledge.”<sup>13</sup> While all laws restrict our freedom to some extent, a government bound by the rule of law will not be able to stifle individual initiatives in an *ad hoc* manner. Within the bounds established by the rules, individuals will

<sup>10</sup> See Xavier Sala-i-Martin, *I Just Ran Two Million Regression*, 87 *Am Econ Rev* 178, 178-183 (1997); Barro, *Determinants of Economic Growth* (cited in note 7).

<sup>11</sup> Douglas Rasmussen and Douglas Den Uyl, *Liberty and Nature: An Aristotelian Defense of Liberal Order* (Open Court, 1991).

<sup>12</sup> Hayek, *The Road to Serfdom* at (cited in note 8); Hayek, *The Constitution of Liberty* (cited in note 8).

<sup>13</sup> Hayek, *The Road to Serfdom* at 72 (cited in note 8).

be free to pursue their own projects. The power of government will not be exercised to interfere with one's private choices arbitrarily.

This security and predictability that the rule of law provides led Hayek to refer to the rules as instruments of production, in that they enable "people to predict the behavior of those with whom they must collaborate."<sup>14</sup> Building on this argument, Hayek makes the case that these rules must be abstract and general.<sup>15</sup> Almost by definition, the abstract and general nature of the rules precludes special privilege and government discretionary planning. The rule of law is part of the intricate mix of institutions that enable individuals to realize the benefits of impersonal exchange and realize advanced economic development.<sup>16</sup>

Robert Barro's findings lend empirical support to the Hayek hypothesis on the rule of law and economic development.<sup>17</sup> Barro finds that the rule of law variable in his regressions turns has a significantly positive coefficient.<sup>18</sup> In short, the maintenance of the rule of law is favorable to economic growth. In fact, what Barro finds is that an improvement by one rank in the rule of law index is estimated to raise the growth rate by 0.5 percentage point annually.<sup>19</sup> Sala-i-Martin provides complementary results to Barro's.<sup>20</sup> He found that even after adopting a sensitivity analysis less restrictive than Leamer's, the rule of law index is a robust predictor of economic growth.<sup>21</sup> More recently, Kaufmann, Kraay, and Zoido-Labaton, using a more objective measure of the rule of law, find that the rule is once again positively correlated with economic growth.<sup>22</sup> Their sample of countries exceeds that of Barro and Sala-i-Martin. Their measure captures the extent to which citizens abide by the laws of their society.<sup>23</sup> For example, they measure the effectiveness of the judiciary and the extent to which the judiciary makes predictable decisions.<sup>24</sup> They also measure the enforceability of contracts. They combine their measures to construct an index that captures the fairness and predictability of the legal framework.<sup>25</sup> We adopt their measure of the rule of law in our empirical framework.

<sup>14</sup> *Id.* at 73.

<sup>15</sup> Hayek, *The Constitution of Liberty* (cited in note 8).

<sup>16</sup> See Olson, *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships* (cited in note 6).

<sup>17</sup> Barro, *Determinants of Economic Growth* (cited in note 7).

<sup>18</sup> *Id.* at 26-28.

<sup>19</sup> *Id.*

<sup>20</sup> Sala-i-Martin, 87 *Am Econ Rev* 178-183 (cited in note 10).

<sup>21</sup> *Id.*

<sup>22</sup> Daniel Kaufmann, Aart Kraay, and Pablo Zoido-Lobaton, *Governance Matters* (World Bank Policy Working Research Paper # 2196, October 1999).

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

Table 1. The Rule of Law and Economic Development

	GDP	GDP	GDP
<i>Rule of Law</i>	0.472 (8.66)**	0.487 (8.72)**	0.471 (6.74)**
<i>Latitude</i>		0.001 -0.58	0.002 -0.77
<i>Ethnolinguistic Fractionalization</i>			-0.002 -0.77
Constant	3.247 (86.28)**	3.205 (54.71)**	3.297 (26.55)**
Observations	137	126	97
R-squared	0.38	0.4	0.44

Robust t-statistics in parentheses

\* significant at 5% level; \*\* significant at 1% level

Table 1 provides further evidence in favor of the rule of law being positively correlated with economic development. The dependent variable is the logarithm of 1999 GDP per capita. Column 1 presents the results when only the rule of law index is an independent variable. The coefficient is statistically significant at the one percent level. Better adherence to the rule of law improves economic development. Using only the rule of law as an independent variable, 38 percent of the variation in economic development can be explained.

It may be the case that the rule of law index is capturing other effects and is not really correlated with economic development. In order to check this, we include latitude and ethnolinguistic fractionalization as control variables. The reason is that both have been found to have a significant negative impact on development.<sup>26</sup> The effect of the rule of law on economic development is still significant. These results are by no means definitive evidence in favor of the claims that the rule of law is a fundamental correlate of economic development. Rather, we simply report them as additional evidence in favor of Hayek's arguments about the rule of law and economic development.<sup>27</sup>

<sup>26</sup> William Easterly, and Ross Levine, *Africa's Growth Tragedy: Policies and Ethnic Divisions*, 112 Q J of Econ 1203, 1203-1250 (1997). John McArthur, and Jeffrey Sachs, *Institutions and Geography: A Comment on Acemoglu, Johnson, and Robinson* (NBER Working paper 8814, 2001).

<sup>27</sup> Our results are complementary to those of Acemoglu, Johnson, and Robinson. Daron Acemoglu, Simon Johnson, and James Robinson, *Colonial Origins of Comparative Development: An Empirical Investigation*, 6 Am Econ Rev 1369, 1369-1401 (2001).

### III. CAPABILITIES NOT PER CAPITA INCOME

The preoccupation with per capita income growth rates among economists has led Sen to emphasize the problem of outliers. The life expectancy of an African American male born in Harlem today is actually lower than his counterpart born in Kerala, India despite the fact that African American's per income level is much higher.<sup>28</sup> Sen emphasizes that shifting focus to the issues of quality of life and the substantive freedoms that individuals enjoy, rather than per capita income, may look like a rejection of economics, but in reality it is a much-needed return to Adam Smith's emphasis on the conditions of living.<sup>29</sup>

Material progress is a necessary condition to improvements in human well-being, but it is not sufficient according to Sen. A favorite example of Sen's to illustrate this point is the relationship between GDP growth in the UK from 1900 to 1960 and life expectancy during that period. The data Sen presents shows that life expectancy increased when growth in GDP growth per capita fell, and decreased when GDP growth per capita rose throughout this period.<sup>30</sup> This suggests that growing income may *decrease* life expectancy. If this is true, then income is not the measure of well-being that we believe it to be.

This finding is not an anomaly. Rather, similar findings have been found throughout the nineteenth and twentieth centuries. For example, Komlos and Coclans confirm evidence of the Antebellum puzzle.<sup>31</sup> This is the claim that biological well-being declined during a period when the Southern economy was growing between 1.4 and 1.6 % per capita annually. As growth occurred, southerners may have experienced decreases in life expectancy. This would seem to provide evidence confirming of Sen's claims. There is more to life than GDP. Yet closer examination suggests that these findings reflect deeper changes in social intercourse.

One possible explanation of the Antebellum puzzle is that there were changing relative prices between carbohydrates and proteins that led people to consume more carbohydrates. As result of the diminished intake of proteins, people's statures declined. This does not mean that food consumption declined as measured by caloric intake. People were not starving. Rather they substituted high value to weight

<sup>28</sup> Sen, *Development as Freedom* at 21-24 (cited in note 4).

<sup>29</sup> *Id.*

<sup>30</sup> *Id.* at 52.

<sup>31</sup> John Kolmos and Peter Coclans, *On the Puzzling Cycle in the Biological Standard of Living: The Case of Antebellum Georgia*, 34 *Explorations in Econ Hist* 433, 433-459 (1997). Similar events have been found in Europe at the end of the eighteenth century. *Id.* See also John Kolmos, *The Secular Trend in the Biological Standard of Living in the United Kingdom: 1730-1860*, 47 *Econ Hist Rev* 115, 115-144 (1993).

ratio foods (animal proteins) for low value to weight ration foods (carbohydrates). In other words, economic analysis does not capture all the relevant information to explain the phenomena under investigation—in this case the changing nature of food consumption in the Antebellum south.

We propose to examine both the claims of Hayek on the economic role of the rule of law and Nussbaum and Sen on human development. Does better protection of the rule of law lead to increases in income that, in turn, lead to increases in human capabilities? In the next section, we will examine this question in a cross-section of countries.

#### IV. EMPIRICAL RESULTS

##### A. The Econometric Framework

We will examine the effects of the rule of law on quality of life. Mathematically, our theory can be summarized in two equations. The first equation is:

$$(1) \textit{Human Capabilities} = \alpha + \beta \textit{GDP} + \varepsilon.$$

This describes the basic relationship between our measures of human capabilities. As GDP rises, so do human capabilities. Our second equation is:

$$(2) \textit{GDP} = \gamma + \delta \textit{Rule of Law} + v.$$

This summarizes the conjecture that improvements in the rule of law are associated with improvements in economic development. The instrumental variables approach allows us to isolate the impact of the rule of law on economic development (equation 2) and use these exogenous components to estimate the impact of development on human capabilities (equation 1).

Our strategy is to use *Rule of Law* as an instrument for *GDP*. This is valid so long as *Rule of Law* is uncorrelated with  $\varepsilon$  and is correlated with *GDP*. The latter we know to be true from earlier empirical studies and our earlier results presented in Table 1. Would we expect, however, the error term,  $\varepsilon$ , to be correlated with the rule of law?

There seems to be no good reason for the rule of law to have a direct impact on human capabilities. Health outcomes, educational attainment, improvements in environmental quality are largely the result of public policy, not to the adherence of the rule of law. Sen argues that the increases in life expectancy during period of low growth in the UK are the result of public policy decisions.<sup>32</sup> The rule of law may

<sup>32</sup> Sen, *Development as Freedom* at 21-24 (cited in note 4).

influence the efficiency of policy implementation, but it does not directly impact the effects of the policies. Table 2 presents the raw correlation between our rule of law measure and our measures of human capabilities. In general, we find that there is a weak correlation between our measures and the rule of law. There is one notable exception: life expectancy. The rule of law is strongly correlated with all three measures of life expectancy. This raises the question of how the rule of law directly impacts life expectancy. It may be that this result is spurious but future research which is beyond the scope of this paper is needed to explore this relationship. One possible explanation is that events such as wars and extensive violent criminal activity, which decrease life expectancy, are reduced when the rule of law is better protected. Overall, the reasons above suggest that there is no reason to believe that the rule of law has a *direct* effect on human capabilities.

## B. The Data

We use a series of variables as dependent variables that serve as proxies for the various aspects of the good life as emphasized by Nussbaum and Dasgupta separates well-being into three categories: health, education, and income.<sup>33</sup> As we have seen, *Rule of Law* is correlated with income so we will not examine this in detail. In this section, we explore whether or not *Rule of Law* correlated with increases in measures of health care and educational attainment. All data come from the World Bank's *World Development Indicators 2001* unless otherwise noted.

The most basic indicator of the quality of human life is life expectancy. Sen provided evidence that as GDP increased, life expectancy fell in the UK in the early part of the twentieth century. We measure *Life Expectancy* as the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. We separate life expectancy into male and female categories.

Two other indicators provide a basic measure for the quality of life. The first is *Illiteracy Rates*. We measure this by the percentage of people ages 15 and above who cannot, with understanding, read and write a short, simple statement on their everyday life. Illiteracy rates are separated into female and male categories. We also use a measure of mortality for newborn children under five, *Infant Mortality*. This measures the probability that a newborn baby will die

<sup>33</sup> Nussbaum, *Women and Human Development* at (cited in note 1); Partha Dasgupta, *An Inquiry into Well-Being and Destitution* (Oxford U Press, 1993).





before reaching age five, if subject to current age-specific mortality rates.

We use several measures of health care. The first is *Health Expenditures*. Total health expenditure is the sum of public and private health expenditures as a ratio of total population. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation. The values are in current international dollars. The second measure of health is *Hospital Beds*, which measures the number of hospital beds per 1000 people. Hospital beds include inpatient beds available in public, private, general, and specialized hospitals and rehabilitation centers. In most cases beds for both acute and chronic care are included.

As a second group of proxies for quality of health care we use are two measures of child immunization. The first is *Immunization*. This measures child immunization rates of vaccination for children under one year of age who are considered adequately immunized against diphtheria, pertussis (or whooping cough), and tetanus (DPT) after receiving three doses of vaccine. The second variable is *Measles*. Child immunization measures the rate of vaccination coverage of children under one year of age who are considered adequately immunized against measles after receiving one dose of vaccine.

Alternative proxies for measuring human capabilities are *Physicians* and *Safe Births*. *Physicians* measures the number of physicians per 1000 people. Physicians are defined as graduates of any faculty or school of medicine who are working in the country in any medical field (practice, teaching, research). *Safe Births* measures the number of births attended by health care providers as the percentage of deliveries attended by personnel trained to give the necessary supervision, care, and advice to women during pregnancy, labor, and the postpartum period, to conduct deliveries on their own, and to care for the newborns. For one to develop the necessary capabilities, it is helpful that they enter this world safely.

We also examine the effects of the economic development on pollution. *Water Pollution* measures the industry shares of emissions of organic water. These emissions come from manufacturing activities as defined by two-digit divisions of the International Standard Industrial Classification (ISIC), revision 2: chemicals (35). Emissions of organic water pollutants are measured by biochemical oxygen demand, which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants. *Organic Water Pollutants* are the emissions of organic water pollutants measured by biochemical

oxygen demand, which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants. Our final measure of pollution is *CO2*. This measures carbon dioxide emissions from industrial processes that stem from the burning of fossil fuels and the manufacture of cement. They include contributions to the carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.

### C. The Results

First, we examine the impact of the rule of law on our basic measures of well-being. These are *Life Expectancy* (male and female), *Infant Mortality*, *Primary and Secondary Education*, and *Illiteracy* (Male and female). Table 3 reports the results. *Life Expectancy* is entered as expected. Improvements in the rule of law lead to improvements in the level of development that, in turn, lead to increased life expectancy. These results are statistically significant at the 1% level. This is true for both females and males with females experiencing larger increases in life expectancy. The rule of law has an indirect statistically significant effect on *Infant Mortality*. For *Illiteracy*, the coefficient on *GDP* is negative and is significant at the 99% level. Once again, this is true for both females and males with improvements in female literacy being greater than the gains that males receive from improvements in the rule of law. Finally, we examine the effects of the economic development on illiteracy rates for both males and females. The coefficients are negative in all regressions and statistically significant. Improvements in income associated with the rule of law seem to increase the basic ingredients of the 'good' life. Furthermore, income seems to be a strong correlate with those things that Nussbaum claimed it was not.

Next we examine the effects of the rule of law on improvements in health. These results are reported in Table 4. *Health Expenditures* are positively correlated with the level of development associated with the rule of law. The same is true for *Hospital Beds*. Both *DPT* and *Measles* are associated with improvements in the rule of law. Improvements in the rule of law increase immunization rates for children. *Good Births* and *Physicians* are influenced by economic development. Table 4 provides further evidence that Nussbaum's conjecture is incorrect. Income is positively correlated with the necessary health pre-conditions for a meaningful life.

We also estimated the effects of development on pollution but are not presented. The results regarding pollution are mixed due to the

Table 3. Development and Human Capabilities

	Life Expectancy	Male Life Expectancy	Female Life Expectancy	Infant Mortality	Primary Education	Secondary Education	Illiteracy	Male Illiteracy	Female Illiteracy
GDP	11.989 (8.29)**	11.395 (8.41)**	12.541 (8.05)**	-55.275 (7.75)**	29.15 (5.35)**	42.058 (7.86)**	-20.236 (3.53)**	-16.045 (3.28)**	-24.077 (3.50)**
Constant	25.843 (5.46)**	25.515 (5.75)**	26.573 (5.21)**	222.59 (9.52)**	-14.767 -0.82	-105.385 (5.97)**	88.335 (4.97)**	69.647 (4.60)**	105.772 (4.97)**
Observations	137	137	137	135	105	105	106	106	106
R-squared	0.61	0.61	0.61	0.19	0.23	0.09	0.45	0.41	0.45

Absolute value of t-statistics in parentheses

\* significant at 5% level; \*\* significant at 1% level

Table 4. Development and Health Outcomes

	Health Expenditures	Hospital Beds	Immuni- zation	Measles	Good Births	Physicians
<i>GDP</i>	895.523 (11.99)**	4.193 (2.59)*	16.483 (4.45)**	15.867 (4.12)**	32.156 (2.54)*	1.082 (2.32)*
Constant	-2,392.22 (9.67)**	-9.717 -1.63	27.57 (2.29)*	29.192 (2.35)*	-25.171 -0.65	-1.959 -1.17
Observations	123	31	130	128	19	43
R-squared	0.73	0.3	0.18	0.2	0.35	0.3

Absolute value of t-statistics in parentheses

\* significant at 5% level; \*\* significant at 1% level

small number of observations involved in each regression. The rule of law does not seem to influence either *Water Pollution* or *Organic Water Pollution*. The results are more encouraging when *CO2* is the dependent variable. As the level of development increases due to improvements in the rule of law, there is a reduction in carbon dioxide pollution.

Overall, the results suggest that improvements in the rule of law lead to improvements in human capabilities. Nussbaum and Sen have rightly emphasized that economists need to focus on more than income when discussing well-being.

In order to check the robustness of our results, we include latitude and ethnolinguistic fractionalization as independent variables. Table 5 presents the results. In all cases, the coefficient on the level of development is significant and is similar to the results presented in tables 3 and 4. Interestingly, the latitude variable is rarely significant. The ethnolinguistic fractionalization is significant but does little to substantially reduce the effect of development on human capabilities.

Finally, we use growth rates from 1970-1999 as an independent variable instead of the level of development. The rule of law continues to be the instrumental variable. The results (not reported) show that growth rates are not correlated with improvements in human capabilities. This is consistent with Sen's claims about the relationship between growth and capabilities; it is simply not there. Growth rates have no impact on those things that Nussbaum suggests are needed for a meaningful life. This should not be surprising. Improvements in growth rates increase the level of development over the long-run. It may be that the reason that higher growth is not associated with improvements in human capabilities is because not enough time has elapsed for the effect to occur. Generations may have to pass before

Table 5. Robustness Results I

	Life Expectancy	Male Life Expectancy	Female Life Expectancy	Infant Mortality	Primary Education	Secondary Education	Illiteracy
<i>GDP</i>	10.963 (5.97)**	9.984 (5.66)**	11.788 (6.13)**	-52 (6.14)**	27.943 (4.20)**	39.305 (6.39)**	-27.778 (4.62)**
<i>Latitude</i>	0.046 -1.34	0.05 -1.52	0.045 -1.27	-0.031 -0.2	-0.282 (2.25)*	0.12 -1.06	0.207 (2.71)**
<i>Ethnolinguistic Fractionalization</i>	-0.06 (2.19)*	-0.055 (2.09)*	-0.065 (2.28)*	0.287 (2.27)*	-0.293 (2.79)**	-0.035 -0.36	0.052 -0.86
Constant	29.659 (4.62)**	30.667 (4.97)**	29.436 (4.38)**	207.143 (6.99)**	2.984 -0.13	-98.205 (4.47)**	110.277 (5.56)**
Observations	97	97	97	97	89	90	77
R-squared	0.7	0.69	0.71	0.4	0.34	0.28	0.62

Absolute value of t-statistics in parentheses  
 \* significant at 5% level, \*\* significant at 1% level

Table 5. Robustness Results Continued

	Male Illiteracy	Female Illiteracy	Health Expenditures	Immuni- zation	Measles
<i>GDP</i>	-22.453 (4.15)**	-32.897 (4.62)**	889.248 (8.07)**	17.977 (3.86)**	19.705 (4.20)**
Latitude	0.128 -1.85	0.288 (3.17)**	2.522 -1.25	-0.044 -0.49	-0.077 -0.89
Ethnolinguistic Fractionalization	0.019 -0.36	0.077 -1.08	2.091 -1.23	0.008 -0.12	0.067 -0.95
Constant	89.514 (5.00)**	130.51 (5.55)**	-2,493.29 (6.32)**	19.393 -1.2	11.914 -0.73
Observations	77	77	89	92	89
R-squared	0.54	0.63	0.72	0.29	0.33

Absolute value of t-statistics in parentheses

\* significant at 5% level; \*\* significant at 1% level

the effects of increases in economic growth manifest themselves. Improvements in human capabilities may not occur until many years have passed since the increase in economic growth.

## V. CONCLUSION

First, we should emphasize that we have not controlled for all the potential factors that affect the rule of law or the various dependent variables. For example, it seems reasonable to control for the effectiveness of public policy in many of the regressions.<sup>34</sup> One can imagine that public policy influences life expectancy and other measures of well-being due to the prevalence of disease in tropical areas. Future research will examine this and other possibilities.

In this paper, we have attempted to demonstrate in the most parsimonious econometric framework, that the rule of law does improve the human lot through its positive impact on economic development. The evidence presented here suggests that the claim by Nussbaum that those things necessary for a meaningful life are correlated with income is incorrect; they are. Sen's claim about the lack of positive correlation between economic growth and life expectancy

<sup>34</sup> Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shliefer, and Robert Vishny, *The Quality of Government*, 15 *J of L Econ, & Org* 222, 222-79 (1999); Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shliefer, and Robert Vishny, *Law and Finance*, 106 *J of Political Economy* 1113, 1113-1155 (1998).

is also incorrect; they are positively correlated. The rule of law provides the necessary framework which promotes prosperity and human capabilities.

Finally, this paper has attempted to further explore the impact of institutions on long-run economic development.<sup>35</sup> Our results suggest that better protection of property rights and a framework that reduces uncertainty about the future not only improve the human lot by raising incomes, but also improves the meaningfulness of the human experience.

<sup>35</sup> Paul Mahoney, *The Common Law and Economic Growth: Hayek Might be Right*, 30 J of Legal Stud 503-525 (2001); Porta, 15 J of L Econ, & Org at 222-79 (cited in note 34); Porta, 106 J of Political Economy at 1113-1155 (cited in note 34); Easterly, 112 Q J of Econ at 1203-1250 (cited in note 26).