Additional Evidence on the Linkages Between Economic Growth and the Institutions of Economic Freedom, Political Rights, and Civil Liberties

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Many recent studies focusing on the forces leading to greater national income make use of the neoclassical Solow Growth Model (1956) (Dawson, 1998; Knight, et al 1993; Mankiw, et al 1992; and Wu and Davis, 1999). This compelling model has proven time and again to be a valuable resource in empirical studies of the causes of economic growth. It suggests that a country's convergence to its "steady state" per capita income is determined by the rates of physical capital accumulation, workforce growth, and technology advances, as well as, initial level of per capita income and the state of technology. The model's performance has also been shown to improve significantly by including the rate of human capital accumulation (Mankiw, et al 1992). However, it can be argued that even the augmented model is not completely specified since it does not incorporate the influences of many other contemporaneous economic forces. Veblen and later institutionalists emphasize the importance of social, political and economic organizations in determining economic outcomes. Schumpeter (1950) and Schmookler (1966) suggest that economic decisions that lead to advances in productivity are strongly linked to the national institutional structure. In recent years, a growing body of empirical evidence has found that variations in income growth rates across nations can be partially attributed to the country's

institutional framework.[1,2] However, the extent of the impact of institutions and the mechanisms through which they are transmitted are still being debated (Abramovitz, 1993; Barro, 1996; Dawson, 1998; Easton and Walker, 1997; and Hanke and Walters, 1997).

Fortunately, today a number of quantifiable and objective measures of political and economic institutional factors exist, allowing empirical examination of their influences on economic growth. This study explores the impacts of institutions by analyzing how the latest published measures of economic freedoms, political rights, and civil liberties are related to cross-country differences in the rates of per capita income growth.

It is vital to understand the distinction between economic freedom and the political freedoms inherent in political rights and civil liberties. Political rights represent the ability of the citizenry to participate in the governmental process through meaningful democratic elections, while civil liberties are freedom of expression and personal choice. Economic freedom, on the other hand, reflects the ability of individuals to make personal choices in market transactions, the protection of personal property, and the ability of individuals to engage in mutually beneficial exchange.. It is possible for a country to rate high in one measure of freedom and low in the other. For instance, Democratic Socialist states provide relatively unrestrained political freedom but circumscribe economic freedom. On the other hand, states such as Singapore and post-Allende Chile are noted for high levels of economic freedom mixed with more constraints on political freedom.

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[1] Institutions refer to the roles of social, political, and economic organizations in shaping economic events.

[2] For discussions of the wide array of variables that have been included in the work of previous authors, see Gould and Ruffin (1993) and Levine and Renelt (1992).

The data set used to examine the causes of economic growth is a pooled cross-sectional time-series for 71 countries over the period 1976-1995. Since the effects of institutions have been shown to vary across stages of development (Durham, 1999; Farr et al, 1998; and Wu and Davis, 1999) this study also explores differences in how per capita income is determined in high income relative to low income countries.

Model Specification

The empirical analysis in this paper builds on the Mankiw, et al (1992) augmented Solow growth model by extending the list of explanatory variables to include institutional measures of economic freedoms, political rights, and civil liberties. The fundamental model is stated as:

(1) $$Y_t = A_t K_t^{\alpha} H_t^{\beta} L_t^{(1-\alpha-\beta)}$$

where Y_t is output, K_t is the stock of physical capital, H_t is the stock of human capital, L_t is labor and A_t is the level of labor augmenting technology that reflects the current level of technology and its impact on labor efficiency in time period t. The parameters α and β represent, respectively, the output elasticity of physical and human capital investment where it is assumed that $0 < \alpha, \beta < 1$ and $\alpha + \beta < 1$, which implies declining marginal products and constant returns to scale. It is further assumed that A_t and L_t grow exogenously at rates g and n, respectively, shown as:

(2) $$A_t = A_0 e^{g\tau} E_{t-1}^{\theta_E} P_{t-1}^{\theta_P} C_{t-1}^{\theta_C}$$

(3) $$L_t = L_0 e^{nt}$$

The level of labor augmenting technology is expanded in equation (2) by specifying that A_t is also dependent upon a country's institutional structure; specifically measures of economic freedom (E), political rights (P), and civil liberties (C).[3] Defining output, physical capital, and human capital per effective unit of labor as $y = Y/AL$, $k = K/AL$, and $h = H/AL$, respectively, and assuming that all capital depreciates at a constant rate δ, the following equation is derived for estimation:[4]

$$(4)\quad lny_t - lny_{t-1} = lnA_0 + \pi_1 lns_{(k)t} + \pi_2 lns_{(h)t} + \pi_3 ln(n + g + \delta)_t + \pi_4 lny_0 + \pi_5 lnE_{t-1} + \pi_6 lnP_{t-1} + \pi_7 lnC_{t-1} + e_t$$

where;

$$\pi_1 = (1 - e^{-\lambda\tau})(\alpha/(1 - \alpha - \beta))$$

$$\pi_2 = (1 - e^{-\lambda\tau})(\beta/(1 - \alpha - \beta))$$

$$\pi_3 = -(1 - e^{-\lambda\tau})((\alpha + \beta)/(1 - \alpha - \beta))$$

$$\pi_4 = -(1 - e^{-\lambda\tau})$$

$$\pi_5 = (1 - e^{-\lambda\tau})\theta_E$$

$$\pi_6 = (1 - e^{-\lambda\tau})\theta_P$$

$$\pi_7 = (1 - e^{-\lambda\tau})\theta_C$$

This equation is commonly referred to as the conditional convergence model where the speed of convergence is defined as $\lambda = (n + g + \delta)(1 - \alpha - \beta)$. The dependent variable $(lny_t - lny_{t-1})$

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[3] The superscripted τ in the equations represents the measurement of time (in years) from one observation to the next. For example, if annual data is used τ=1, if subsequent observations range over a five year period τ=5, etc.

[4] For a more detailed description of the derivation, see Mankiw et al (1992) and Wu and Davis (1999).

represents the growth rate of income per efficiency unit of labor and the intercept term (lnA_0) includes the impact on total factor productivity of all factors not explicitly accounted for in the equation, such as resource endowments, cultural characteristics, climate, etc. The terms $s_{(k)}$ and $s_{(h)}$ represent the fraction of income invested in physical and human capital, respectively. In the fourth term, g and δ, are assumed to be constant across countries and exogenously determined, which implies that the only variable factor in this term is the growth rate of the workforce (n). The fifth term represents the initial level of income per efficiency unit of labor (lny_0) that captures the convergence implied in the equation. Countries that begin with higher per worker incomes should grow more slowly over time due to the presence of diminishing marginal returns. The last three terms, lnE_{t-1}, lnP_{t-1}, and lnC_{t-1}, capture the impact on growth of the institutions of economic freedom, political freedom, and civil liberty, respectively. These measures enter the equation as instrumental variables; specifically as lagged observations of the institutional variables. Lagging the freedom measures is justified on two fronts. The first is that economic performance responds to changes that have occurred in institutions only after the participants in the economy have had time to digest and respond to the changes. The second argument for lagging the institutional measures is to control for possibility of reverse causation. It has been shown that previous changes in economic growth are significantly related with subsequent changes in economic freedom (Farr et al, 1998). The exact lag structure is an empirical question that must be addressed, however, for this study it is be assumed that a one period lag is sufficient. Finally, the π_i represent parameters to be estimated that implies the restriction $\pi_1 + \pi_2 = -\pi_3$.

A priori, it might seem reasonable to expect that each of the freedom measures should have a positive impact on growth. There is a widely held perception that "freedom," defined broadly, and

economic well-being are intertwined. A large body of empirical evidence now exists demonstrating the impacts of institutional freedoms on economic growth. While there is considerable substantiation that economic freedom is positively correlated with economic growth, the nature of the impact of the political freedoms on economic growth has been mixed (see Dawson, 1998; Farr et. al., 1998; Przeworski and Limongi, 1993; and Wu and Davis 1999). In particular, the relationship between democracy and growth is controversial (see Wade, 1990; and Olson 1993).

Data

Data to measure income per effective unit of labor (y), the fraction of income invested in physical capital ($s_{(k)}$) and human capital ($s_{(h)}$), and the rate of growth of labor (n) are taken from *The World Development Indicators 1999 CD-ROM*. Income per effective unit of labor (y) is measured as GDP at market prices in constant 1995 US dollars divided by the working age population[5]. Investment in physical capital ($s_{(k)}$) is measured by gross domestic fixed investment as a percentage of GDP and investment in human capital ($s_{(h)}$) is proxied as the ratio of total tertiary school enrollment to the population of the age group that officially corresponds to this level of education. The growth rate of labor (n) is proxied using data that measures the percentage changes in the working age population.

The economic freedom measures are the most recently published that are available in the *Economic Freedom of the World 2000 Annual Report* by Gwartney and Lawson (2000). This report provides the most comprehensive measurement of economic freedom to date available in

[5] Working age population is defined as the those between the ages of 15 and 64.

the *Economic Freedom of the World Annual Reports*. This version includes economic freedom measures (*E*) for 123 countries for five-year non-overlapping periods dating back to 1970. The measure for each period is a continuous variable with a maximum value of ten, which represents the greatest economic freedom, to a minimum of zero. The composite index is a weighted average of 23 measures of economic freedom. These measures fall into seven sub-categories: (1) size of the government, (2) use of market institutions, (3) price stability, (4) freedom to hold foreign currency, (5) legal structure and property rights, (6) freedom to trade with foreigners, and (7) freedom to exchange in capital markets. The measures of political rights (*P*) and civil liberties (*C*) are taken from the *Freedom in the World* annual surveys published by the Freedom House. Political rights measure the extent to which citizens are able to meaningfully participate in the political process. Civil liberties measure activities such as the right of citizens to speak freely, the ability to engage in personal activities of ones choosing and the ability to travel freely. Each is measured on an ordinal seven-point scale, with one representing the highest level of freedom and seven representing the lowest. However, to maintain consistency with the other data used in the study, these measures are inverted so that one represents the lowest level and seven represents the highest.

Panel data containing time-series observations for a large number of countries are used in this study. A panel data approach has many advantages that can be attributed to combining the information of both time-series and cross-sectional observations. However, there are also potential dangers, as noted by Harbarger (1987), concerning whether it is appropriate to include so many disparate nations in a single regression.

Due to the five-year aggregation employed in the composite measure of economic freedom and to help eliminate the "noise" that is common in annual data, all other variables used in the study are also averaged over five-year periods to maintain conformity. Each variable included in the model has four time-series observations for each country. All variables, except the freedom measures, are calculated by averaging annual data observations over the four five-year, non-overlapping periods; 1976-1980, 1981-1985, 1986-1990, and 1991-1995. For the freedom measures, which are lagged one period, the observations for each country are gathered for the following periods; 1971-1975, 1976-1980, 1981-1985, and 1986-1990.[6] Only nations with complete data for each of the four five-year periods were employed in the study. This results in a data set containing 252 observations from a total of 64 countries.[7]

Several previous studies have found that the impact of the various types of freedom on economic growth vary with a nation's stage of development. For instance, Farr, et. al. (1998) uncovered differences between industrial and non-industrial countries[8] while Wu and Davis (1999) found variation between OECD and non-OECD states. In this study the over-all sample is also be broken into sub-samples based on income to examine for differences between lower and higher income countries. The definitions provided by the World Bank are used to partition the data. The first sub-sample consists of "low income" (per capita annual GDP less than $785) and "lower middle income" countries (income between $786 and $3,125) while the second sub-sample

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[6] The measures of political rights and civil liberties begin in 1973 thus limiting the number of observations averaged during the first five year period to three.

[7] These nations are listed in the Table 5.

[8] The definitions of industrial and non-industrial states were taken from the *Economic Freedom of the World 1997 Annual Report* by Gwartney and Lawson (1997).

contains "upper middle income" ($3,126 to $9,655) and "high income" countries (over $9,656). The World Bank categories are assumed to provide a reasonably consistent breakdown of the data for estimation. This provides two samples comprised of 34 countries in the "upper income" group and 29 in the "lower income" sample.

Estimation Procedure

Rewriting equation (4) to incorporate the cross-country and time series components yields:

$$(5)\quad lny_{i,t} - lny_{i,t-1} = lnA_{i,0} + \pi_1 lns_{(k)i,t} + \pi_2 lns_{(h)i,t} + \pi_3 ln(n + g + \delta)_{i,t} + \pi_4 lny_{i,0} + \pi_5 lnE_{i,t-1} + \pi_6 lnP_{i,t-1} + \pi_7 lnC_{i,t-1} + \sum_{i=1}^{n} \phi_i D_i + \xi_i + \epsilon_t + \mu_{i,t}$$

(for country i= 1,2,...,N; and time period t= 1,2,...,T)

where ξ_i and ϵ_t represent the country- and time-specific effects, respectively. Country dummy variables (D_i) are added to account for the country specific effects, thereby controlling for differences in base levels of total factor productivity due to factors not explicitly included in the specified equation. Since the number of "time-series" observations are small relative to the number of countries and because the time dimension data are averaged over five-year periods, it is assumed that the time-specific effects are insignificant and are hence ignored (Greene, 1997). OLS is used to estimate the cross-country equation parameters, however, the reported standard errors are corrected for potential heteroskedasticity using White's (1980) methodology.

To test if the institutional freedoms significantly impact economic growth, equation (5) is estimated in both a restricted and unrestricted form. The restricted equation excludes the freedom measures while the unrestricted form is as defined in equation (5). After estimating the equation using data from the full sample of 63 nations, the procedure is repeated for the two sub-samples of 39 high income nations and 32 lower income nations to examine for differences by stage of development.

After the two models are estimated for each of the samples it is possible to determine if, and how, the three lagged institutional freedom measures contribute to economic growth. This is done by first testing if the explanatory power of the unrestricted equation is significantly greater than restricted equation using a Wald-test. The results of this test, together with the estimates of the π parameters from the two equations, make it possible to draw inferences about the channels through which the freedom measures impact economic growth. According to Dawson (1998), if institutional freedoms lead to economic growth primarily by altering physical and human capital investment, the inclusion of the freedom variables will add no additional explanatory power to the unrestricted equation but will alter the coefficients on these variables shown in the restricted equation. If the impact of the freedom variables is on total factor productivity, then their inclusion in the unrestricted equation will add significantly to the explanation of cross-country growth rates but not impact the magnitudes of the restricted equation π's. If the institutional measures of freedom affect both, then their parameter estimates will be statistically significant and their addition will alter the coefficients of the restricted augmented Solow growth model investment variables.

Results

The parameter estimates of the restricted and unrestricted versions of equation (5) along with other diagnostic statistics are shown in Table (1). The dummy variable parameter estimates are not shown in order to focus attention on the impacts of the Solow variables and various freedom measures.[9]

In each equation estimated, the implied α's are reasonably consistent with theoretical expectations, while the estimated β's are generally lower than expected. The low β values are common in empirical studies and can be attributed to the imperfection of the proxy used for measuring investment in human capital, especially in the developing world. The implied λ's suggest that one-half the movement to a nation's steady state is achieved in approximately 9 to 12 years. The relatively fast pace of convergence is influenced significantly by the large number of lesser development countries included in the data sets.

The first column in Table (1) shows the results of the restricted equation (5) estimated using data for all 71 countries. All of these parameter estimates are statistically significant and the signs correspond with expectations. The R^2 indicates that the restricted model explains almost 77% of the variation in economic growth. The second column in Table (1) shows the full sample results for the unrestricted version of equation (5). These results suggest that the freedom measures effect economic growth through an impact on total factor productivity and capital investment. This can be seen by the statistical significance of the Wald statistic and the observed changes in the coefficients on the measures of physical and human capital investment in the unrestricted relative to the restricted equation. In addition to reducing the magnitude of the human capital

[9] These estimates are available from the authors upon request.

coefficient (π_2), the inclusion of the freedom measures causes this variable to lose statistical significance. The three parameter estimates for the freedom measures, π_5, π_6, and π_7, are all statistically significant and the signs indicate that economic freedom (π_5) and civil liberties (π_7) are positively related to growth. An interesting result found for the full sample is that political rights (π_6) are negatively related to growth. As mentioned earlier, the relationship between democratic institutions and economic growth is a very controversial subject and empirical results on this relationship have been mixed.

The results for equation (5) using data from the 34 higher income countries are presented in the third and fourth columns of Table (1). Again, all of the parameters for the restricted version of equation (5) are statistically significant and agree with expectations. The addition of the three freedom measures increases the explanatory power of the model from 74% to 79%, which the Wald-test suggests is statistically significant. This again means that the freedom measures have a significant effect on economic growth through an impact on total factor productivity. For this sample, adding the freedom measures has little impact on the magnitude of π_1 but reduces the estimate of π_2 from 0.122 to 0.037, a 69% drop. This again causes the human capital measure to lose statistical significance. These results indicate that freedoms have a significant impact on the level of investment in human capital in the higher income nations, but little impact on investment in physical capital. The correlation matrix in Table (3) shows the existence of a strong relationship between the freedom measures and investment in human capital. The other interesting result for this sample is that π_6, the parameter associated with political rights, is not significantly related to growth, while the estimates of π_5 and π_7 suggest that both economic freedom and civil rights positively impact growth.

Results for the lower income nations are shown in the final two columns of Table (1). The parameter estimates of the restricted version of equation (5) are shown in the fifth column and are, for the most part, similar to those for the other two samples. The most pronounced difference is that π_2, the parameter for investment in human capital, is not statistically significant. When the three freedom measures are added to the restricted equation for the low income countries, R^2 rises from 77% to 84%. The Wald-test indicates this is, again, a significant increase in explanatory power, meaning the freedom measures impact economic growth through total factor productivity. The inclusion of the freedom measures for the lower income countries has a very different impact on π_1 and π_2 than is the case for the higher income nations.[10] For the poorer countries, π_1 rather than π_2 diminishes indicating that the freedoms have a significant impact on the level of investment in physical capital, whereas their effect on human capital is inconsequential. For the lower income countries π_5 is, again positive and significant; the anticipated relationship between economic freedom and growth. However, for these countries the relationship between political rights and growth, π_6, is negative and significant, while π_7, the parameter estimate associated with civil rights, is not statistically significant.

Summary

This study adds three institutional measures of freedom to the augmented Solow growth model to explore their impacts on economic growth. The three quantitative measures of freedom employed are (1) economic freedom, taken from the *Economic Freedom of the World 2000*

[10] Comparing the standard deviation on the logarithm of the freedom measures between Tables (3) and (4) reveal that the freedom measures are much more variable in the lower income countries. The greater homogeneity of the higher income nations is not surprising.

Annual Report by Gwartney and Lawson (2000), (2) political rights and (3) civil liberties, both taken from annual surveys of the *Freedom in the World* reports published by the Freedom House. The focus is on whether, and through what mechanism, these three measures of freedom affect economic performance. This is accomplished by adding the three freedom measures to the augmented Solow growth model to determine if they add explanatory power to the model. If the freedom measures enter significantly, this indicates that the institutional freedoms impact economic growth through an effect on national total factor productivity. Also, if the inclusion of the freedom measures result in a change in the magnitude of coefficients on the investment variables, this can be interpreted as evidence that freedoms work through an impact on these variables.

The analysis is performed on a set of panel data comprising 71 countries during four five-year non-overlapping periods from 1976 through 1995. To determine consistency of the results for countries at different stages of development, the above data is also analyzed by dividing it into two smaller panels consisting of 34 higher income countries and 29 lower income nations, according to the World Bank income definitions.

The results indicate that the lagged measures of freedom are significant in explaining variations in economic growth for all three data sets suggesting that they effect national total factor productivity. For the aggregate sample there is also evidence that the freedom measures effect growth through an impact on investment in both physical and human capital. Further evidence on the relationship between freedom and capital can be drawn from the results for the sub-samples. For the wealthier nations, freedom appears to have an important effect on investment in human capital, but not on investment in physical capital. In the sample of less

affluent countries, the result is opposite, suggesting the level of freedom impacts investment in physical capital but has no discernable impact on investment in human capital. These results are interesting, because there are claims that some level of freedom, particularly from arbitrary expropriation, is necessary to encourage investment in physical capital. Only after this groundwork is laid, is there a reasonable return to investment in human capital. The results for the two sub-samples of wealthier and poorer nations seem to support such a thesis.

The signs and magnitudes of the regression parameters on the three measures of freedom for the three different samples also provide interesting insights. In the aggregate sample, economic freedom and civil liberties are significant and positively related to growth, while political rights have a significant negative effect on economic growth. For the higher income countries the positive relationship between both economic freedom and civil liberties with growth are, again, observed, however, there is no significant association between political rights and growth. Results for the lower income nations show that economic freedom is also positively related to growth, but there is significant evidence of a negative relationship between political rights and economic expansion. In these countries, there is no evidence of a significant relationship between civil liberties and growth. The negative relationship between political rights and growth is interesting since considerable evidence suggests that this relationship is ambiguous. Several theoreticians have produced arguments that while political rights should be positively correlated with growth in the long-run, it might cause short-term problems.

This paper adds to the growing body of evidence on the relationship of economic and political freedoms to economic growth. The results of this study suggest that the elements of freedom have a significant impact of total factor productivity as well as investment in both human

and physical capital. There are also observable differences in how the variables studied effect growth for high income and low income nations. One obvious goal for future research in the field is to find some rational method for establishing the definitions of high and low income countries; as all previous efforts have relied on arbitrary definitions.

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Table 1: Augmented Solow Growth Model with Institutional Measures
{dependent variable = $\ln(y_{i,t}) - \ln(y_{i,t-1})$}

Variable	All Countries (n=252)		Higher Income Countries (n=136)		Lower Income Countries (n=116)	
	restricted	unrestricted	restricted	unrestricted	restricted	unrestricted
$\ln(s_k)$ (π_1)	0.245* (.024)	0.202* (.024)	0.282* (.038)	0.280* (.037)	0.222* (.033)	0.146* (.032)
$\ln(s_h)$ (π_2)	0.067* (.017)	0.036** (.017)	0.095* (.022)	0.061* (.024)	0.041 (.030)	0.014 (.027)
$\ln(n + .05)$ (π_3)	-0.094* (.028)	-0.092* (.027)	-0.079* (.029)	-0.080* (.029)	-0.190* (.075)	-0.184* (.065)
$\ln(y_{i,0})$ (π_4)	-0.246* (.035)	-0.274* (.034)	-0.311* (.053)	-0.314* (.050)	-0.209* (.049)	-0.251* (.045)
$\ln(E_{t-1})$ (π_5)		0.153* (.032)		0.090 (.059)		0.174* (.039)
$\ln(P_{t-1})$ (π_6)		-0.028 (.017)		0.028 (.035)		-0.053* (.020)
$\ln(C_{t-1})$ (π_7)		0.049** (.025)		0.079*** (.046)		0.026 (.029)
Implied λ	.056	.064	.075	.075	.047	.058
Implied α	.44	.40	.41	.43	.48	.36
Implied β	.12	.07	.14	.09	.09	.03
R^2	.8032	.8296	.7869	.8149	.8082	.8604
Wald test of Restriction ($\pi_1 + \pi_2 = -\pi_3$)	24.74*	11.50*	30.20*	22.68*	0.603	0.083
Wald test for added variables		9.40*		4.78*		9.99 *

All variables are measured in natural logs
Standard errors are shown in parentheses
* Significant at the 1% level
** Significant at the 5% level
*** Significant at the 10% level

Table 2: ***All Countries: Data Correlation Matrix***[1]

	y_t-y_{t-1}	y_0	s_k	s_h	n	E	P	C
y_t-y_{t-1}	1.00	.09	.57	.08	-.15	.26	.10	.08
y_0		*1.00*	*.33*	*.84*	*-.58*	*.63*	*.70*	*.71*
s_k			1.00	.32	.02	.31	.27	.21
s_h				1.00	-.42	.54	.66	.65
n					1.00	-.40	-.40	-.43
E						1.00	.42	.47
P							1.00	.87
C								1.00
Mean	0.05	8.78	3.02	2.47	-1.82	1.69	1.45	1.43
Std. Dev.	0.12	1.54	0.29	1.27	0.38	0.30	0.59	0.47
Min.	-0.31	5.66	1.74	-1.20	-2.89	0.69	0.00	0.00
Max.	0.43	11.14	3.82	4.55	-1.15	2.21	1.95	1.95

[1] All variables are measured in natural logs. (N=252)

Table 3: ***Higher Income Countries: Data Correlation Matrix***[1]

	y_t-y_{t-1}	y_0	s_k	s_h	n	E	P	C
y_t-y_{t-1}	1.00	-.23	.54	-.29	.02	.05	-.01	-.09
y_0		*1.00*	*-.10*	*.78*	*-.63*	*.58*	*.50*	*.60*
s_k			1.00	-.25	.30	.03	-.11	-.22
s_h				1.00	-.47	.53	.29	.40
n					1.00	-.33	-.40	-.45
E						1.00	.31	.31
P							1.00	.85
C								1.00
Mean	0.09	9.93	3.09	3.10	-2.01	1.83	1.73	1.70
Std. Dev.	0.10	0.83	0.23	0.87	0.42	0.24	0.35	0.32
Min.	-0.24	7.58	2.41	0.00	-2.89	1.16	0.00	0.69
Max.	0.43	11.14	3.82	4.55	-1.15	2.21	1.95	1.95

[1] All variables are measured in natural logs. (N=136)

Table 4: ***Lower Income Countries: Data Correlation Matrix***[1]

	y_t-y_{t-1}	y_0	s_k	s_h	n	E	P	C
y_t-y_{t-1}	1.00	-.10	.54	.12	-.21	.28	-.05	-.03
y_0		*1.00*	*.34*	*.84*	*-.45*	*.30*	*.53*	*.50*
s_k			1.00	.46	.14	.32	.26	.23
s_h				1.00	.31	.25	.63	.55
n					1.00	.14	.19	.19
E						1.00	.13	.22
P							1.00	.81
C								1.00
Mean	0.03	7.42	2.93	1.73	-1.60	1.51	1.07	1.18
Std. Dev.	0.13	0.98	0.32	1.26	0.15	0.28	0.62	0.47
Min.	-0.31	5.66	1.74	-1.20	-2.01	0.69	0.00	0.00
Max.	0.35	9.09	3.69	3.55	-1.30	2.09	1.95	1.95

[1] All variables are measured in natural logs. (N=116)

Table 5: List of Included Countries

Higher Income Countries	*Lower Income Countries*
1. Argentina	1. Bangladesh
2. Australia	2. Benin
3. Austria	3. Burundi
4. Belgium	4. Colombia
5. Botswana	5. Costa Rica
6. Brazil	6. Dominican Republic
7. Canada	7. Ecuador
8. Chile	8. Egypt
9. Denmark	9. Ghana
10. Finland	10. Guatemala
11. France	11. Honduras
12. Greece	12. India
13. Ireland	13. Indonesia
14. Israel	14. Jamaica
15. Italy	15. Kenya
16. Japan	16. Madagascar
17. Malaysia	17. Malawi
18. Mauritius	18. Mali
19. Mexico	19. Morocco
20. Netherlands	20. Nicaragua
21. New Zealand	21. Niger
22. Norway	22. Pakistan
23. Portugal	23. Panama
24. Singapore	24. Peru
25. South Africa	25. Philippines
26. South Korea	26. Syria
27. Spain	27. Thailand
28. Sweden	28. Tunisia
29. Trinidad & Tobago	29. Zambia
30. Turkey	
31. United Kingdom	
32. United States	
33 Uruguay	
34. Venezuela	