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Does Economic Performance Correlate with Big Government?

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ABSTRACT, KEYWORDS, JEL CODES

FOR OVER A DECADE ECONOMISTS HAVE WORKED TO DEVELOP accurate measurements of economic freedom—a leading effort can be found online at www.freetheworld.com. Researchers are now using this work to address the most important economic question of them all: What accounts for differences in the wealth of nations? In fact most of a recent issue of the *Cato Journal* (2003) is devoted to papers that include new tests of the hypothesis that economic growth and economic freedom are positively associated. They corroborate the expected relationship.

Adam Smith discussed the importance of division of labor, the maturity of markets, and improved transportation as determinants of economic growth. But more importantly he put forward a theory *in terms of policy and institutional variables*. He argued English prosperity was due to "the general liberty of trade," the "equal and impartial administration of justice" (Smith [1776], 576), "the private frugality and good conduct of individuals . . . protected by law and allowed by liberty" (Smith [1776], 329). As for the size

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of government, Smith favored the government provision of certain basic public goods, but he generally supported provision by local independent authorities that received fees from users. He regarded high taxes and big government to be at odds with "the obvious and simple system of natural liberty" (Smith [1776], 651) and an "impertinent obstruction" (508) to economic development.

A Smithian resurrection is found in the works of such writers as Peter Bauer (1976) and Deepak Lal (1999), in the *Economic Freedom of the World* by James Gwartney and Robert Lawson (2003), and in the work of "New Institutionalists" (e.g., Haber, North, and Weingast 2003). Furthermore, like Adam Smith, some researchers have also recognized that causality runs in both directions. The character of the political system is itself subject to the development of the economy (Rapaczynski 1996).

Inquiry into the true reasons behind the differences in development has prompted statistical studies of the relationship between economic development, political institutions, and the size of public sectors. Some of these (Goldsmith 1995, Dawson 2003, Farr, Lord, and Wolfenbarger 1998, Powell 2003, Vega-Gordillo and Alvarez-Arce 2003) have found a positive relationship between economic growth and economic freedom. A study by Campos and Nugent showed that governance played a prominent role in improving development performance (Campos and Nugent 1999, 449). It is less clear whether political freedom by itself has economic consequences. Kirmanoglu (2003) found, "more political freedom seems to generate higher economic growth" (Kirmanoglu 2003, p. 7) in some countries. But other studies (Vega-Gordillo and Alvarez-Arce 2003, and Kurzman, Werum, and Burkhart 2002) indicated no strong statistical evidence in support of the relationship between economic development and political freedom; neither could a causal relationship between political freedom and economic freedom be found by Farr, Lord, and Wolfenbarger (260). On the other hand, the most recent IMF report (2003) and studies by Acemoglu, Johnson, and Robinson (2002), Bajic and Belgrade (2003), and Rodrik and Subramanian (2003) showed that the quality of institutions has a significantly positive relationship with economic development, vindicating the impression that countries with *respect for the development of political institutions* tend to grow faster and enjoy higher levels of prosperity.

As for the relationship between size of public sector and economic development, Agell, Lindh, and Ohlsson (1997), Ayal and Karras (1998), and Nelson and Singh (1998), did not find statistically significant relationships between the rate of economic growth and the size of the public sector. However, Knack, and Keefer (1995), Barro (1997), Gwartney,

Holcombe, and Lawson (1998), and Folster and Henrekson (2001) have provided evidence that the relationship between growth and public expenditures, "may be more robustly negative than it first appears" (Folster, Henrekson 2001, 1514).

LA PORTA, LOPEZ-DE-SILANES, SHLEIFER, AND VISHNY ON SIZE OF GOVERNMENT

A particularly interesting and wide-ranging discussion of these possible relationships is included in "The Quality of Government" by La Porta, Lopez-de-Silanes, Shleifer, and Vishny, in *The Journal of Law, Economics, & Organization* (1999). The authors note that "government shapes the economic life of a country in a variety ways" (225), *and,* "economic development itself creates a demand for good government" (230). Thus they acknowledge the simultaneous relationship between economic growth and political institutions. Yet, as the discussants of the paper, Zucker and Darby (1999) note, La Porta *et al.* do not test this suggested simultaneous relationship—even though the La Porta *et al.* argument points this way.[1] Instead, they define and try to explain the following dimensions of government performance.

- *Interference with the Private Sector*, which is concerned with the quality of regulation, security of property rights, and marginal tax rate.

- *Efficiency of Government*, which is indicated by corruption, bureaucratic delays, tax compliance, and average relative wages of government officials.

- *Output of Public Goods*, measured by infant mortality, school achievement, illiteracy rate, and infrastructure quality.

[1] It should be noted that except for the studies by Dawson (2003), Farr, Lord, and Wolfenbarger (1998), Vega-Gordillo and Alvarez-Arce (2003), Kirmanoglu (2003) who used Granger causality tests to address question of causality between the factors, the other studies mentioned so far have merely suggested "a partial correlation" (Dawson 2003, 480) between various measures of economic growth, government performance, and related institutions.

- *Size of Government*, which they infer from government consumption, transfers and subsidies, SOEs, and employment in public sectors.

La Porta *et al.* seek to explain these dimensions of government performance via three exogenous variables expected to have significant influences. The suggested explanatory variables are:

- *Legal Origin* (English Common Law, French Commercial Code, German Commercial Code, Scandinavian Commercial Code, Socialist/Communist laws).

- *Religion* (the percentage of the population of each country that belong to the three most widespread religions, namely Roman Catholic, Protestant, or Muslim).

- *Ethnolinguistic Fractionalization* (a complex index of ethnic heterogeneity).

The exogenous variables were found to have systematic influences on the quality of government. Ethnolinguistically homogeneous countries, common law countries, and countries with lower proportions of Catholic or Muslim religions have better governments (265).

La Porta *et al.*'s numerous linear regressions also reveal that, "rich nations have better governments than poor ones." They add that, "we will use the term 'good' in this article to stand for good-for-economic-development" (223). This makes perfect sense because development is the ultimate test of policy effectiveness.

Given the soundness of their finding, it would be correct to caution, as La Porta *et al.* do, that, "larger governments tend to be the better performing ones" (222), and "identifying big government with bad government can be highly misleading" (266).

In light of the tantalizing questions about causality relationships and the influence of the size of government on economic development raised by La Porta *et al.*, we tested the causal relationships between *three* dimensions: *Economic Development*, *Political Institutions*, and *Scope of Public Sector*, by estimating two simultaneous equation models. The indicators used were created via an aggregation procedure described in the appendix; we derived indicators that roughly correspond to the La Porta *et al.* groupings of dependent variables.

Table 1: Variables and Indices

PLSV: The Quality of Government			Gordon and Wang		
Dimensions of the Quality of Government		**Variables**		**Dimensions of Development**	**Variables**
Economic Development	Independent Variables	Log GNP per capita	Exogenous Variables		Ethnolinguistic fractionalization
Determinants		Latitude			Legal origin
		Ethnolinguistic fractionalization			Religion
		Legal origin			
		Religion			
Interference with Private Sector	Dependent Variables	Property rights index	Endogenous Variables	Political Institutions	Property rights index
		Business regulation index			Regulation index
		Top tax rate			Political rights index
					Civil liberties index
Political Rights		Democracy index			
		Political rights index			
Size of Public Sector		Transfers and subsides as % of GDP		Scope of Public Sector	Transfer and subsides as % of GDP
		Govt. consumption as % of GDP			Govt. consumption as % of GDP
		SOEs in the economy			SOEs in the economy
		Public sector employ. as % of population			
Output of Public Goods		Log of infant mortality		Economic Development	Infant mortality
		Log of school achievement			GDP per capita
		Illiteracy rate			Urbanization
		Infrastructure quality			Imports
					Exports
Efficiency		Corruption			
		Bureaucratic delays			
		Tax compliance			
		Average government wages/GDP per capita			

The data processed in our analysis were for 47 countries for five periods. We did not know which sample was used by La Porta *et al.* but we utilized their published data where possible. Their data appendix lists many more countries than they report were actually used in their tests. Data details are discussed in our Appendix Tables: A1-A4.

A comparison of La Porta *et al.* groupings and our indicators is shown in Table 1. Based on the revised set of indicators, the following three variables are presumed to be interrelated: 1) *Political Institutions*, approximates economic freedom, 2) *Scope of Public Sector*, is self-explanatory, and 3) *Economic Development*, also self-explanatory.

The results of our statistical tests challenge La Porta *et al.*'s finding that governments with better performing economies are larger and collect higher taxes.

STATISTICAL FINDINGS

We show versions of the simultaneous model that La Porta *et al.* suggested, but chose not to estimate. Model 1 suggests a simultaneous relationship between *Economic Development*, *Political Institutions*, and *Scope of Public Sector*. The three equations are identified by adding the value of the five-year lagged dependent variable in each equation. This approach rests on the assumption that lagged variables are "predetermined" (Theil 1971, 436)—and that, in this case, the five-year changes in these variables were sufficient for them to qualify as exogenous. Rapid change in the latter part of the twentieth century gives some credence to this view (Campos and Nugent 1999, Shirley 2003[2]). Model 2 is similar, but adds La Porta *et al.*'s exogenous variables to each equation. Findings from the estimations of both models do not support the conclusions about the size of government reported by La Porta *et al.*—admittedly, they used slightly different indicators to describe the size of government (the differences are noted in Table 1).

Both of our models show that economic freedom, as indicated by *Political Institutions*, is significantly positive in explaining *Economic Development*.

[2] Mary M. Shirley cites this as the view of the foreign aid community.

Table 2: Results of Statistical Estimations

	Dependent Variable						
	Model 1				Model 2		
	Economic Develop-ment*(n)*	Political Insti-tutions*(n)*	Scope of Public Sector*(n)*		Economic Develop-ment*(n)*	Political Insti-tutions*(n)*	Scope of Public Sector*(n)*
Intercept	-2.218 (-0.61)	1.51 (0.45)	**6.57 (3.11)**		159.9 (0.4)	347.4 (0.99)	-43.36 (-0.16)
Economic Develop-ment*(n)*		**0.112 (4.43)**	-0.02 (-1.08)			**0.095 (3.59)**	-0.023 (-1.06)
Political Insti-tutions*(n)*	**0.14 (2.90)**		0.019 (0.54)		**0.281 (3.81)**		0.005 (0.10)
Scope of Public Sector*(n)*	0.058 (0.65)	0.06 (0.78)			0.017 (0.17)	0.055 (0.62)	
Economic Develop-ment *(n-1)*	**0.893 (31.93)**				**0.876 (30.02)**		
Political Insti-tutions*(n-1)*		**0.773 (20.76)**				**0.67 (14.14)**	
Scope of Public Sector*(n-1)*			**0.811 (16.83)**				**0.77 (15.09)**
Ethno-linguistic fraction					3.24 (1.00)	-5.12 (1.88)	1.07 (0.5)
Legal origin					-1.712 (-1.80)	0.72 (0.86)	-0.263 (-0.41)
Protestant					-1.64 (-0.42)	-3.36 (-0.96)	0.527 (0.2)
Catholic					-1.62 (-0.41)	-3.38 (-0.96)	0.532 (0.2)
Muslim					-1.56 (-0.40)	-3.44 (-0.98)	0.509 (0.19)
Other Religions					-1.61 (-0.41)	-3.40 (-0.97)	0.51 (0.19)
Adj R-sq	0.94	0.86	0.66		0.94	0.86	0.65
Pr > F	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001

* Numbers in parentheses are t-value for the coefficients. Bolded numbers indicate that results are statistically significant, meaning that they could not arise from chance with a 95 percent level of confidence.

Economic Development, in turn, fosters economic freedom. *Size of Public Sector* does not significantly affect either one.

These interpretations are based on the standard 95 percent level of statistical significance cut-off, meaning that the results are unlikely to come from chance associations.

The La Porta *et al.* exogenous variables tested in Model 2 do *not* show a statistically significant influence on any of the endogenous variables. However, this does not necessarily mean that legal origin and religions are not important for economic development, because the substance of these two exogenous variables could be embedded in the current institutional arrangements of the society[3]. This incomplete exogeneity is also noted by La Porta *et al.* (233). Simple OLS tests (see discussion of Table 3, below) consider this relationship.

Results in Table 3 show four La Porta *et al.*-type OLS tests for the endogenous variables developed in this study. Compared with the La Porta *et al.* results, the influence from the exogenous variables on the *Political Institutions*, *Scope of Public Sector*, and *Economic Development* are similar. Countries with more democratic legal origins show freer economic institutions, and also tend to be related with superior economic development, and smaller size of public sectors. On the other hand, Ethnolinguistic Fractionalization, which is positively related with the *Scope of Public Sector*, "has a very consistent adverse effect" (La Porta *et al.*, 245) on *Political Institutions* and *Economic Development*. For the religions, Catholic and Muslim tend to negatively affect the *Economic Development* and *Political Institutions*.

[3] Our 47 observations (see Table A2 in the appendix) include countries with English Law, French Law, German Law, Scandia law, and countries with large percentages of Muslims. The geographic locations of these countries are in Africa, Europe, North America, South America, south Asia, southeast Asia, and south Pacific. institutions, public sectors, and economic development across the countries could capture some impact from different religions and legal origins.

Table 3: OLS Estimation of Determinants of Dimensions of Development

	Dependent Variable						
	Model 1				Model 2		
	Economic Develop.	Political Institutions	Scope of Public Sector		Economic Develop.	Political Institutions	Scope of Public Sector
Intercept	507.5 (0.45)	279.59 (0.52)	82.34 (0.22)		**78.66 (7.73)**	**41.08 (8.48)**	**26.62 (7.98)**
Ethno-linguistic fraction	**-58.75 (8.58)**	**-35.52 (-10.90)**	**8.79 (3.92)**		**-59.85 (-9.68)**	**-36.13 (-12.29)**	**8.65 (4.27)**
Legal origin	3.51 (1.39)	**6.39 (5.31)**	-0.98 (-1.19)		3.817 (1.60)	**6.56 (5.78)**	-0.95 (-1.21)
Muslim	-4.43 (-0.39)	-2.52 (-0.46)	-0.52 (-0.14)		-0.15 (-1.97)	**-0.136 (-3.73)**	0.03 (1.25)
Catholic	-4.26 (-0.37)	-2.29 (-0.42)	-0.49 (-0.13)		0.017 (0.23)	**0.09 (2.69)**	**0.063 (2.62)**
Protestant	-4.06 (-0.36)	-2.21 (-0.41)	-0.56 (-0.15)		**0.2 2(2.97)**	**0.168 (4.77)**	-0.002 (-0.08)
Other	-4.28 (-0.38)	-2.38 (-0.44)	-0.56 (-0.15)				
Adj R-sq	0.41	0.62	0.14		0.41	0.62	0.14
Pr > F	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001
	Model 3				Model 4		
	Economic Develop-ment	Political Institutions	Scope of Public Sector		Economic Development	Political Institutions	Scope of Public Sector
Intercept	**94.66 (10.78)**	**53.29 (12.41)**	**26.46 (9.38)**		**80.09 (15.7)**	**52.15 (21.06)**	**34.33 (20.6)**
Ethno-linguistic fraction	**-64.12 (-10.49)**	**-39.39 (-13.17)**	**8.69 (4.42)**		**-65.44 (-10.69)**	**-39.49 (-13.3)**	**9.4 (4.7)**
Legal origin	2.73 (1.14)	**5.73 (4.88)**	-0.93 (-1.21)		**5.9 (3.22)**	**5.98 (6.73)**	**-2.65 (-4.42)**
Muslim	**-0.289 (-4.65)**	**-0.24 (-7.94)**	0.03 (1.64)		**-0.208 (-4.35)**	**-0.235 (-10.51)**	-0.011 (-0.72)
Catholic	**-0.119 (-2.03)**	-0.009 (-0.33)	**0.06 (3.41)**				
Protest-ant							
Other							
Adj R-sq	0.39	0.58	0.14		0.38	0.58	0.10
Pr > F	<.0001	<.0001	<.0001		<.0001	<.0001	0.003

For Table 3:

Numbers in parentheses are the t-values for estimated coefficients.
Four models are formulated as:

Model 1: $Y = \alpha + b_1 Eth + b_2 Legal + b_3 Muslm + b_3 Cath + b_4 \Pr ote + b_5 Oth$

Model 2: $Y = \alpha + b_1 Eth + b_2 Legal + b_3 Muslm + b_3 Cath + b_4 \Pr ote$

Model 3: $Y = \alpha + b_1 Eth + b_2 Legal + b_3 Muslm + b_3 Cath$

Model 4: $Y = \alpha + b_1 Eth + b_2 Legal + b_3 Muslm$

DISCUSSION AND FURTHER RESEARCH

Development is a systemic evolution that is not limited to the improvement of economic performance *per se*. It also requires and prompts improvement of political institutions and performance of public sectors. Inspired by the La Porta *et al.* discussion, results shown here—which, contrary to La Porta *et al.*, find no effect on economic development from the size of government—represent an effort to identify simultaneous relationships between three variables, *Political Institutions*, *Scope of Public Sector*, and *Economic Development*. Not only is the beneficial effect of a large public sector cast into doubt, but the interdependencies between three fundamental endogenous variables are tested and the links that are found to matter are plausible. In simultaneous equation models, *Political Institutions* that indicate economic freedom positively affect *Economic Development*, which, in turn, promotes economic freedom. Also, the three indices tested relate to the La Porta *et al.* exogenous variables in ways that corroborate their OLS results, suggesting that our indices do reflect the labels we have given them.

Much remains to be done, including:

1. Improved measurement of the three endogenous variables: *Economic Development*, *Political Institutions* and *Scope of Public Sector*. La Porta *et al.* classified the observable variables into four categories: *Interference with Private Sector*, *Efficiency of Government*, *Output of Public Goods*, and the *Size of Government*. However, quantitative measurement for these four is missing in their analysis. In some other studies, for example, the recent Brookings Child Well-Being Index, and some

index values in the Index of Economic Freedom, are derived by using unweighted average value from the related indicators.[4] The index value for the three new variables developed in this study took the correlation between the observable indicators into consideration and tried to eliminate double-counting. The shortcoming of this measurement, however, is that it could reduce the importance of the proportion of variance for each of the observable variable shared by all remaining variables. There might be some better way to not only solve the double-counting problem, but also to emphasize the derived index as well.[5]

2. Due to the few available time periods (five here), a dynamic simultaneous equations model—perhaps a better way to capture lag influences on different variables—could not be estimated. In future work with better data, Granger-causality tests between the variables, especially between *Political Institutions* and *Economic Development* might illuminate these matters.

3. Future work should consider past differences across countries—a point noted by Hayek (1978), who wrote, "a high rate of growth can sometimes testify to bad policies of the past rather than good policies of the present" (189), and by Olson (1996), who noted, "poorer countries that adopt relatively good economic policies and institutions enjoy rapid catch-up growth" (20). The coefficients for a hypothesized causal relationship between *Political Institutions*, *Economic Development*, and *Scope of Public Sector* might differ between poor countries and richer ones.

In any event, we regard La Porta *et al.* as a stimulating and valuable contribution, yet at this point our priors about big government remain.

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[4] The formula is: $$Y = \sum_{i=1}^{n} x_i \Big/ n$$

[5] Factor analysis was also attempted, but the result did not provide plausible classifications. The possible explanation for this is probably due to the correlations between the indicators for *Political Institutions*, *Scope of Public Sector*, and *Economic Development*.

APPENDIX

Data

The variables used are indicators of *Political Institutions*, *Economic Development* and *Scope of Public Sector*, available from different sources for different years. Data for 1980, 1985, 1990, 1995, and 2000 were collected. Combining a large number of data sets that have different numbers of observations and restricted by data comparability across different years left us 47 observations. Table A1 shows the availability of observations. Table A3 lists the mean value and standard deviation of each indicator for 47 countries. The definitions and sources for all the variables used in this research are summarized as follows:

Endogenous indicators

Property rights index: A rating of property rights in each country (on a scale from 1 to 10). "The more protection private property receives, the higher the score" (La Porta *et al.* 1999, 235). This index is based on five sub-factors: (1) "judicial independence: the judiciary is independent and not subject to interference by the government or parties in disputes;" (2) "impartial court: a trusted legal framework exists for private businesses to challenge the legality of government actions or regulation;" (3) "protection of intellectual property;" (4) "military interference in rule of law and the political process;" (5) "integrity of the legal system." This index value comes from the "Index of Economic Freedom."[6]

Business regulation index: This rating index is based on five sub-factors as well. 1) the presence of price controls; 2) whether administrative procedures are an important obstacle to starting a new business; 3) time taken up by government bureaucracy; 4) whether it is generally easy to start a new business; 5) whether the "irregular, additional payments connected with import and export permits, business licenses, exchange controls, tax assessments, police protection, or loan applications"[6] are not common. It also ranges from 1 to 10. Higher scores mean that regulations are

[6] Gwartney, J. G., and Lawson, R. A. (2003), *Economic Freedom of the World 2003 Annual Report,* available from http://www.freetheworld.com/2003/1EFW2003ch1.pdf, p24-32. Data are available from http://www.freetheworld.com/2003/EFW2003Dataset.xls

straightforward and applied uniformly to all businesses and the regulations are less of a burden to business. Index value is from the "Index of Economic Freedom."

Political rights index: This index comes from "Freedom in the World,"[7] published annually by Freedom House since 1978. Political rights enable people to participate freely in the political process. It includes the right to vote and compete for public office and to elect representatives who have a decisive vote on public policies. The rating ranges from 1 to 7. The higher the rating, the less freedom.

Civil liberties: This index also comes from "Freedom in the World."[8] It indicates the freedom to develop opinions, institutions, and personal autonomy without interference from the state. The rating ranges from 1 to 7. The higher the rating, the less civil rights the public can expect.

Transfers and subsidies: Transfers and subsidies as a share of GDP. The rating ranges from 1 to 10. Lower ratings refer to a larger proportion of transfers and subsidies from the GDP. The data source is the "Index of Economic Freedom."

Government consumption: General government consumption as a share of total consumption. The rating ranges from 1 to 10 and is negatively related to government consumption. The data source is the "Index of Economic Freedom."

SOEs in the economy: These data are also from the "Index of Economic Freedom". Information on the number, composition, and share of output supplied by State-Operated Enterprises (SOEs), and government investment as a share of total investment were used to construct 0-to-10 ratings. Countries with more government enterprises and government investment received lower ratings.

Infant mortality: This value comes from the *World Development Indicators 2003* (World Bank 2003). It refers to the infant mortality rate per 1,000 live births.

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[7] Gastil, R. D., *Freedom in the World: PoliticalRights and Civil Liberties*, New York: Freedom House, 1978, 1981, 1983-1984-1985/1986, 1987/1988, 1990/1991, 1992/1993-1993/1994, 1996/1997-1999/2000, 2001/2002-2003.

GDP per capita: This is an adjusted GDP value based on constant 1995 US dollars. Data are from *World Development Indicators 2003*.

Urbanization: This is a measure for the percent of the urban population as a fraction of the country's total population. Data are from *World Development Indicators 2003*.

Imports/Exports of goods and services: The percentage of imports/exports of goods and services in GDP. Data are from *World Development Indicators 2003*.

Exogenous variables[8]

Ethnolinguistic fractionalization:[9] This is the average value of five different indices, ranging from 0 to 1. "The five component indices are: 1) index of ethnolinguistic fractionalization in 1960, which measures the probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group (the index is based on the number and size of population groups as distinguished by their ethnic and linguistic status); 2) probability of two randomly selected individuals speaking different languages; 3) probability of two randomly selected individuals do not speak the same language; 4) percent of the population not speaking the official language; and 5) percent of the population not speaking the most widely used language" (La Porta *et al.* 1999, 238).

Religion: "(T)he percentage of the population of each country that belonged to three most widely spread religious formation:" (1) Roman Catholic; (2) Protestant; (3) Muslim. The data are available for 1990-1995 and are also from La Porta *et al.* (1999).

Legal Origin: Five possible legal originations are identified: (1) English Common law; (2) French Commercial Code; (3) German Commercial

[8] Data source for exogenous variables comes from: La Porta *et al.* (1999).

[9] Original data source: Easterly and Levine (1997). The sources of the components of the average index are: (1) Atlas Narodov Mira (1964); (2) Muller (1964); (3) Roberts (1962); (4) and (5) Gunnemark (1991), see page 238 in La Porta *et al* (1999).

Code; (4) Scandinavian Commercial Code; and (5) Socialist/Communist laws. The source is La Porta *et al.* (1999).

Data Analysis

Of the variables used in this study, the property rights index, the business regulation index, the political rights index and the civil liberties index are mainly concerned with the political policies which define the "rules of game," or in other words, define the *Political Institutions* relevant for socioeconomic activities. Transfers and subsides, government consumption, SOEs could be the proxies for the *Scope of Public Sector,* similar to the definition of "*Size of Government*" in La Porta *et al.* The performance of *Economic Development* could be inferred from GDP per capita, urbanization, the infant mortality rate, exports and imports. In order to specify these three variables: *Political Institutions, Scope of Public Sector, and Economic Development*, a summary index[10] is constructed as follows:

$$A_{cn} = \frac{1}{2}\sum_{i=1}^{m}\sum_{j=1}^{m}(1-\left|\gamma_{n.ij}\right|/2)\times(X_{cn.i}+X_{cn.j}) \qquad i \neq j$$

where,

A_{cn} ---represents the calculated index value for latent factors in country *c* and in specific time *n*. Latent variables refer to

[10] We have defined a weighted index. Gwartney and Lawson (2003) acknowledge the problems of defining a proper index:" Over the years, we have struggled with how to assign weights to various components and areas to construct a summary index. After experimenting with three different weighting schemes in the first edition, we finally settled on using principle component analysis to assign weights statistically. Although principle component analysis has the advantage of being value-neutral, it does create problems of its own. In particular, when two components are closely correlated, as often happens, then principle component analysis tends to assign low weights to one or both of these components. In essence, the principle component analysis wants to drop out the interrelated components. But, we often want to include these componentseven if they are correlated with other components in order to offset measurement error in the data and to increase the number of countries we can rate. We, therefore, decided to return to using a simple average to combine the components into area ratings and the area ratings into summary ratings in the 2002 report. Although this edition of the index uses averages, we do not mean to imply that all components and areas of economic freedom are equally important in whatever sense. Readers who want to reweigh the components and areas to suit themselves are invited to do so" (Gwartney and Lawson 2003, 22).

Political Institutions, Scope of Public Sector, and *Economic Development*.

i, j---refers the number of observable variables.

Economic Development has 5 observable variables, including: GDP per capita; infant mortality[11]; urbanization; exports and imports;

Political Institutions includes 4 observable variables: business regulation index; property rights index; political rights index and civil liberties;

Scope of Public Sector includes 3 observable variables: transfer and subsides; SOEs; and government consumption shares.

$\gamma_{n.ij}$ ---represents the correlation value in time *n* between each two observable variables *X*.

$X_{cn.i}$, $X_{cn.i}$ --represents the normalized value[12] in country *c* and in specific time *n* for observable variables.

The correlation value for the original data and for three newly generated index values is displayed in the Table A4 and Table A5. From Table A4, most of the correlation values are statistically significant, especially, the correlation between political rights and civil liberties (0.897), between GDP per capita and infant mortality rate (0.831), between GDP per capita and property rights (0.802) is noteworthy. As for the exogenous variables, Muslim religion and ethnolinguistic fraction displayed significant and negative correlation with the regulation index, property rights index, political rights, and civil liberties. This may indicate that predominance of Muslim religion or higher ethnolinguistic fraction could come with less economic freedom. Legal origins[13] has positive correlation with the regulation and property rights indices, which suggests that common law could be associated with the better political institutions. From Table A5, there are three interesting findings:

[11] The value for infant mortality rate, political rights index, and civil liberties index is inversed before aggregation in order to make higher value indicate better health situation, stronger civil liberties and political freedom.

[12] The value for indicators is normalized for 1-10 scales (GDP per capita value is normalized based on its natural log value).

[13] In this paper, English common law is assigned value 4, German Commercial Code and Scandinavian Commercial Code are assigned value 3, French Commercial Code is assigned 2, and Socialist/Communist laws are assigned value 1.

1. *Economic Development*, *Political Institutions*, and *Scope of Public Sector* have significant path dependencies. For example, the correlation between the *Scope of Public Sector* in year 2000 and in 1995 is 0.923. We can also see that the longer the time gaps, the smaller the correlation, which might be an indication that there could exist other factors besides performance itself coming into play during the passage of time. We can also observe that the correlation between *Political Institutions* and *Economic Development* across time persists more strongly by itself—the decrease of correlation with elapsed time is smaller than that of *Scope of Public Sector*.

2. Another interesting observation is that the correlation between *Economic Development* and *Political Institutions* is stronger than the correlation between *Scope of Public Sector* and *Political Institutions* or *Economic Development*.

3. For the exogenous variables, Muslim and Ethnolinguistic fraction have strong negative correlations with *Political Institutions*, while the Protestant religion has a positive correlation with *Political Institutions*. Legal origin seems to have weaker correlations with *Political Institutions*.

Based on these observations, two simultaneous equation models are suggested to estimate the significance of each factor's influence.

$$\begin{cases} P_n = \alpha_p + \gamma_p P_{n-1} + \beta_{p1} I_n + \beta_{p2} E_n \\ I_n = \alpha_i + \gamma_i I_{n-1} + \beta_{i1} P_n + \beta_{i2} E_n \\ E_n = \alpha_e + \gamma_e E_{n-1} + \beta_{e1} P_n + \beta_{e2} I_n \end{cases} \tag{2}$$

$$\begin{cases} P_n = \alpha_p + \gamma_p P_{n-1} + \beta_{p1} I_n + \beta_{p2} E_n + \lambda_{11} Eth + \lambda_{12} Legal + \lambda_{13} \mathrm{Prote} + \lambda_{14} Cath + \lambda_{15} Muslm + \lambda_{16} Oth \\ I_n = \alpha_i + \gamma_i I_{n-1} + \beta_{i1} P_n + \beta_{i2} E_n + \lambda_{21} Eth + \lambda_{22} Legal + \lambda_{23} \mathrm{Prote} + \lambda_{24} Cath + \lambda_{25} Muslm + \lambda_{26} Oth \\ E_n = \alpha_e + \gamma_e E_{n-1} + \beta_{e1} P_n + \beta_{e2} I_n + \lambda_{31} Eth + \lambda_{32} Legal + \lambda_{33} \mathrm{Prote} + \lambda_{34} Cath + \lambda_{35} Muslm + \lambda_{36} Oth \end{cases} \tag{3}$$

where,

n: refers to time, measured in five-year period,
P: refers to *Scope of Public Sector*,
I: refers to *Political Institutions*,
E: refers to *Economic Development*,
Eth: refers to *Ethnolinguistic Fraction* value,
Legal: Legal Origin,
Prote, Cath, Muslm, and Other: refers proportion value for Protestant, Roman Catholic, Muslim and Other religions.

α -- are regression intercepts

β , λ --are regression coefficients

The reason for using a simultaneous equation model in this research is to try to capture the causal forces between the variables based on available data sources. More specifically, what is interesting about the simultaneous equation model is that the variable of *Political Institutions* is one of the suspected causes of another variable like *Economic Development*; at the same time, *Economic Development* is one of the suspected causes of *Political Institutions*. Based on theoretical arguments from institutional economics, the simultaneous equation model might be able to provide a more comprehensive understanding of the relationship between the factors. In this investigation, models (2) and (3) assume that all the countries have the same path dependency pattern in terms of the relationship between *Economic Development*, *Political Institutions*, and *Scope of Public Sector*. Regression results are displayed in Table 2.

From Table 2, the results shown for Model 1 and Model 2 corroborate the idea that *Economic Development*, *Political Institutions*, and *Scope of Public Sector* have significant path dependencies. For example, in Model 1, improvement of one unit on *Political Institutions* in year *n-1* would cause a 0.77 unit of improvement on *Political Institutions* in year *n*.

For cross sectional influence, we see that *Political Institutions* has an important and positive effect on *Economic Development*. The influence of *Political Institutions* on *Economic Development* in Model 1 and Model 2 is 0.14 and 0.28 respectively. On the other hand, *Economic Development* in both models shows that one unit improvement on economic performance could well induce 0.1 unit of institutional change. *Scope of Public Sector* doesn't significantly affect either one.

Table A1: Data Availability

Variable	Data Availability, No. of Countries				
	Year 1980	Year 1985	Year 1990	Year 1995	Year 2000
Business Regulation index[1]	103	106	118	123	123
Property Rights index[1]	90	110	111	123	123
Political Rights index[3]	109	112	115	123	123
Civil Liberties[3]	109	112	115	123	123
Transfers and Subsidies[1]	85	90	96	103	99
SOE[1]	113	114	114	122	123
Government Consumption Share[1]	113	115	120	122	122
GDP per Capita (US Dollars '95)[2]	105	108	115	115	113
Infant Mortality[2]	116	116	116	116	116
Urbanization[2]	115	116	115	115	115
Exports of Goods and Services[2]	101	104	115	115	111
Imports of Goods and Services[2]	103	104	115	115	111
Ethnolinguistic Fractionalization[4]	107	107	107	107	107
Religion[4]	123	123	123	123	123
Legal Origin[4]	119	119	119	119	119
1. Gwartney and Lawson (2003): http://www.freetheworld.com/2003/EFW2003Dataset.xls					
2. World Bank, World Development Indicators 2003, Washington: World Bank.					
3. Raymond D. Gastil, Freedom in the world : political rights and civil liberties, New York : Freedom House, 1981, 1983-1984-1985/1986, 1990/1991, 1992/1993-1993/1994, 1996/1997-1999/2000, 2001/2002-2003).					
4. La Porta *et al.* (1999)					

Table A2: 47 Observations Used in This Study

COUNTRIES	Region	Legal Origin	Protestant	Catholic	Muslim	Other
Australia	Australia	English	23.5	29.6	0.2	46.7
Austria	Europe	German	6.5	88.8	0.6	4.1
Belgium	Europe	French	0.4	90	1.1	8.5
Brazil	S. America	French	4	87.8	0.1	8.1
Cameroon	West Africa	French	19.1	35	22	24.9
Canada	N. America	English	29.6	46.6	0.6	23.2
Chile	S. America	French	1.9	82.1	0	16
Colombia	S. America	French	0.9	96.6	0.2	2.3
Costa Rica	S. America	French	5.8	90.5	0	3.7
Denmark	Europe	Scandin	95.2	0.6	0.2	4
Domin. Rep	S. America	French	1.4	96.6	0	2
Ecuador	S. America	French	1.9	96.4	0	1.7
Egypt	Middle East	French	0.2	0.2	81.8	17.8
Finland	Europe	Scandin	93.1	0.1	0	6.8
France	Europe	French	2.4	76.4	3	18.2
Greece	Europe	French	0.1	0.4	1.5	98
Guatemala	S. America	French	4.9	94	0	1.1
Iceland	Europe	Scandin	96.6	0.7	0	2.7
India	South Asia	English	1.1	1.3	11.6	86
Indonesia	SE Asia	French	4.8	2.7	43.4	49.1
Israel	Middle East	English	0.2	1	8	90.8
Italy	Europe	French	0.4	83.2	0.1	16.3
Jordan	Middle East	French	0.3	1.7	93	5
Kenya	East Africa	English	19.3	26.4	6	48.3
Malaysia	South Asia	English	1.4	2.8	49.4	46.4
Mexico	S. America	French	1.2	94.7	0	4.1
Morocco	N. Africa	French	0	0.2	99.4	0.4
Netherlands	Europe	French	42.4	42.6	1	14
New Zealand	Australian	English	37.9	18.7	0	43.4
Norway	Europe	Scandin	97.8	0.3	0.1	1.8
Pakistan	South Asia	English	0.8	0.5	96.8	1.9
Panama	S. America	French	5.2	85	4.5	5.3
Philippines	SE Asia	French	3.8	84.1	4.3	7.8
Portugal	Europe	French	1.1	94.1	0	4.8
South Africa	S. Africa	English	39	10.4	1.3	49.3
Spain	Europe	French	0.1	96.9	0	3
Sri Lanka	South Asia	English	0.4	6.8	7.2	85.6
Sweden	Europe	Scandin	68.4	1.4	0.1	30.1
Switzerland	Europe	German	43.2	52.8	0.3	3.7
Trinidad & Tob	S. America	English	13.2	35.8	6.5	44.5
Tunisia	N. Africa	French	0	0.1	99.4	0.5

Turkey	Europe	French	0	0.1	99.2	0.7
U. Kingdom	Europe	English	16.1	13.1	1.4	69.4
U. States	N. America	English	43.6	30	0.8	25.6
Uruguay	Middle Af.	French	1.9	59.5	0	38.6
Zambia	Middle Af.	English	31.9	26.2	0.3	41.6
Zimbabwe	Middle Af.	English	21.4	14.4	0.9	63.3
Data source: La Porta, et al. (1999) Appendix B.						

Table A3: Average and Standard Deviation
(47 Observations Used in This Study)

	2000		1995		1990	
	Ave.	Std	Ave.	Std	Ave.	Std
Regulation Index	6.31	0.93	6.19	1	5.6	0.68
Property Rights	6.67	2.04	6.58	1.8	5.92	2.06
Political Rights	2.45	1.97	2.49	1.84	2.55	1.84
Civil Liberties	2.7	1.55	2.91	1.73	2.6	1.6
Trans & Sub.	7.14	2.2	6.89	2.54	7.02	2.38
SOEs	5.7	2.77	5.23	2.64	4.66	2.54
Govt. Consump.	5.65	2.58	5.46	2.3	5.42	2.28
GDP Per Capita	12925.05	13743.55	11374.6	12109.25	10800.39	11789.91
Mortality	25.05	27.36	27.7	27.48	31.31	28.05
Urbanization	66.01	19.34	64.26	19.91	61.99	20.51
Exports	36.72	19.77	32.22	15.16	29.69	14.39
Imports	37.16	16.93	33.47	15.54	31.29	16.05

	1985		1980	
	Average	Std	Average	Std
Regulation Index	5.55	0.87	5.49	0.83
Property Rights	5.75	1.78	5.64	1.77
Political Rights	2.64	1.75	2.85	1.85
Civil Liberties	2.89	1.82	2.91	1.77
Trans & Sub.	6.87	2.32	7.15	2.16
SOEs	3.89	2.54	3.13	2.68
Govt. Consump.	6.58	2.12	7.2	2.08
GDP Per Capita	9770.4	10606.31	9165.67	9779.44
Mortality	37.44	31.62	43.99	35.55
Urbanization	59.91	21.29	57.86	22.13
Exports	28.79	12.96	28.35	13.02
Imports	30.21	14.4	32.29	15.03

Data source: see Table A1.

Table A4: Correlations, All Indicators Used in This Study

	REGU	PROP RIGT	Political rights	civil liberty	TRASF SUB	SOE	GOV COS
REGUL	1						
PROP RIGT	.441 **	1					
Political rights	.355 **	.667 **	1				
Civil liberty	.370 **	.695 **	.897 **	1			
TRASF SUB	-.136 *	-.683 **	-.618 **	-.655 **	1		
SOE	.433 **	.315 **	.388 **	.376 **	-.188 **	1	
GOV COS	-.192 **	-.491 **	-.329 **	-.358 **	.604 **	-.073	1
GDPC	.352 **	.802 **	.736 **	.776 **	-.793 **	.381 **	-.509 **
MORTA	.424 **	.649 **	.695 **	.688 **	-.640 **	.397 **	-.456 **
URBAN	.326 **	.621 **	.597 **	.631 **	-.630 **	.360 **	-.499 **
EXP	-.003	.099	.000	.090	-.217 **	-.105	-.181 **
IMP	.039	.020	-.065	-.016	-.126	-.138 *	-.276 **
ETHOF	-.176 **	-.389 **	-.502 **	-.531 **	.494 **	-.218 **	.231 **
LAW	.270 **	.180 **	.076	.091	.001	-.096	-.224 **
Protestnt	.277 **	.516 **	.317 **	.422 **	-.364 **	.192 **	-.385 **
Catholic	.035	-.040	.212 **	.200 **	-.033	.208 **	.260 **
Muslim	-.243 **	-.353 **	-.511 **	-.528 **	.347 **	-.303 **	.112
OTHER	-.052	-.066	-.032	-.104	.020	-.139 *	-.098

Table A4: Correlations (cont.)

	GDPC	MORTA	URBAN	EXP	IMP	ETHOF	LAW
GDPC	1						
MORTA	.831 **	1					
URBAN	.795 **	.701 **	1				
EXP	.210 **	.247 **	.179 **	1			
IMP	.086	.189 **	.114	.837 **	1		
ETHOF	-.584 **	-.604 **	-.618 **	.000	-.049	1	
LAW	.012	.002	-.102	.047	.000	.384 **	1
Protestnt	.498 **	.313 **	.296 **	.141 *	-.019	-.121	.305 **
Catholic	.084	.151 *	.149 *	-.074	-.141 *	-.196 **	-.506 **
Muslim	-.412 **	-.438 **	-.292 **	.004	.205 **	.060	-.152 *
OTHER	-.154 *	-.028	-.177 **	-.046	-.021	.333 **	.573 **

	Protestant	CATHOLIC	MUSLIM	OTHER
Protestnt	1			
Catholic	-.392 **	1		
Muslim	-.301 **	-.469 **	1	
OTHER	-.130 *	-.458 **	-.192 **	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table A5: Correlations, Three Index Values Used in This Study

	SCP00	SCP95	SCP90	SCP85	SCP80	INT00	INT95
SCP00	1						
SCP95	.923 **	1					
SCP90	.860 **	.920 **	1				
SCP85	.764 **	.805 **	.885 **	1			
SCP80	.567 **	.644 **	.619 **	.556 **	1		
INST00	-.232	-.280	-.222	-.165	-.445 **	1	
INST95	-.228	-.297 *	-.230	-.152	-.466 **	.957 **	1
INST90	-.145	-.225	-.146	-.094	-.413 **	.903 **	.923 **
INST85	-.252	-.333 *	-.246	-.188	-.443 **	.853 **	.868 **
INST80	-.144	-.251	-.192	-.156	-.384 **	.783 **	.805 **
ECO00	-.319 *	-.324 *	-.212	-.237	-.499 **	.724 **	.728 **
ECO95	-.374 **	-.376 **	-.269	-.290 *	-.538 **	.718 **	.732 **
ECO90	-.412 **	-.415 **	-.315 *	-.326 *	-.571 **	.730 **	.747 **
ECO85	-.466 **	-.478 **	-.389 **	-.383 **	-.627 **	.776 **	.794 **
ECO80	-.460 **	-.479 **	-.408 **	-.417 **	-.620 **	.742 **	.752 **
ETHOF	.218	.240	.136	.164	.240	-.502 **	-.520 **
LAW	-.106	-.184	-.277	-.235	-.088	.138	.167
Protestnt	-.224	-.263	-.254	-.047	-.372 **	.484 **	.515 **
Catholic	.210	.267	.361 *	.334 *	.101	.141	.169
Muslim	.009	-.018	-.039	-.083	.211	-.565 **	-.559 **
OTHER	-.074	-.083	-.200	-.324 *	-.003	-.043	-.120

Table A5: Correlations (cont.)

	INT90	INT85	INT80	ECO00	ECO95	ECO90	ECO85
INST90	1						
INST85	.936 **	1					
INST80	.853 **	.921 **	1				
ECO00	.744 **	.708 **	.639 **	1			
ECO95	.717 **	.686 **	.617 **	.989 **	1		
ECO90	.705 **	.673 **	.594 **	.968 **	.986 **	1	
ECO85	.732 **	.709 **	.631 **	.936 **	.956 **	.978 **	1
ECO80	.662 **	.651 **	.573 **	.896 **	.930 **	.955 **	.976 **
ETHOF	-.609 **	-.550 **	-.437 **	-.561 **	-.563 **	-.582 **	-.545 **
LAW	.023	.161	.234	-.077	-.025	-.055	.002
Protestant	.404 **	.414 **	.424 **	.293 *	.328 *	.329 *	.409 **
Catholic	.228	.132	.125	.110	.074	.085	.048
Muslim	-.507 **	-.480 **	-.522 **	-.254	-.259	-.255	-.334 *
OTHER	-.150	-.057	-.006	-.162	-.142	-.163	-.102
	ECO80	ETHF	LAW	Protestnt	Catholic	Muslim	OTHER
ECO80	1						
ETHOF	-.486 **	1					
LAW	.075	.384 **	1				
Protestnt	.426 **	-.121	.305 *	1			
Catholic	.012	-.196	-.506 **	-.392 **	1		
Muslim	-.351 *	.060	-.152	-.301 *	-.469 **	1	
OTHER	-.049	.333 *	.573 **	-.130	-.458 **	-.192	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

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