



# Economic Systems of Developing Nations

FREDERIC L PRYOR<sup>1</sup>

Swarthmore College, Swarthmore, PA 19081, USA. E-mail: fpryor1@swarthmore.edu

This essay employs a database of covering 31 different types of economic institutions for 41 developing nations. Defining an economic system in terms of clusters of complementary institutions and performing a cluster analysis, I derive four different types of economic systems. Then I explore the impact of the economic system on the economic growth, inflation rate, and production volatility of the nations with each system.

*Comparative Economic Studies* (2006) **48**, 77–99. doi:10.1057/palgrave.ces.8100072

---

**Keywords:** economic system, institutions, all developing nations

**JEL Classifications:** O-110, O-579, P-510

In the analysis of economic systems and their consequences, most discussion in the literature focuses on industrialised nations. In this short exploratory essay, I explore how economic systems of developing nations can be defined in terms of complementary institutions and, once such a classification is derived from a cluster analysis, explore briefly how the different economic system in these nations significantly affect their economic performance.

In the first section, I discuss the statistical technique used for deriving an economic system in terms of its institutional structure and conjecture why, up to now, the systems of developing nations have not received a great deal of attention. In the following section, I carry out a cluster analysis of 31 different variables reflecting different economic institutions in 41 nations to determine the economic system of each. In the third section, I explore whether the systems variable has any impact on three indicators of economic

<sup>1</sup>I thank Walter Park, Dennis Quinn, and A Maria Toyoda for supplying data. I am grateful to Stephen A O'Connell and Zora Pryor for commenting on an early draft of this paper.



performance, namely growth of per capita GDP, inflation, and production volatility in the last 2 decades of the 20th century.

## DEFINING THE ECONOMIC SYSTEM

### Methodological observations

An economic system comprises the configuration of institutions and organisations that specify property relations within a given society or that channel and influence the distribution of goods and services. This type of standard definition focuses attention on economic institutions, which, according to Douglass C North (1998, p.79) are:

‘... the humanly devised constraints that structure human interaction. They are made up of formal constraints (e.g., rules, laws, constitutions), informal constraints (e.g., norms of behavior, conventions, self-imposed codes of conduct) and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies.’

They also facilitate the organisation and conduct of transactions between members of the society and, crucial to their effectiveness, employ various enforcement mechanisms, which can be based on habits, rules of morality, customs, rights, or coercion. Institutions influence beliefs and behaviours of individuals and groups, and thus the preferences and priorities expressed through both public decisions (Engerman and Sokoloff, 2003).

Most analysts select arbitrarily one or two key institutions with which to specify the economic system, for instance, market *versus* planned economy, the share of government ownership in the means of production, the relative importance of government expenditures or regulation, the dominant ideology, the most important economic values (individualistic, social, communitarian), the most common structure of enterprises, and so forth.<sup>2</sup> Some social scientists have developed certain models and then classified countries according to how closely they approximate these ‘ideal types.’ But, as Richard Grassby sourly notes (1999, p. 2), ideal types are ‘fictive generalizations about the predominant characteristics of a particular society, projected from selected historical facts and intended to serve as a basis for universal analysis.’

---

<sup>2</sup> A 19th century example is found in the work of Bruno Hildebrand, who classified economic systems according to their reliance on barter, money, or credit in their transfer of goods and services. Bert F Hoselitz (1960) notes the ambiguity of this type of analysis: do these categories represent phases of a temporal sequence (*economic stages*), *ideal types* of economic system, or the most important *economic principles* underlying the functioning of an economy?



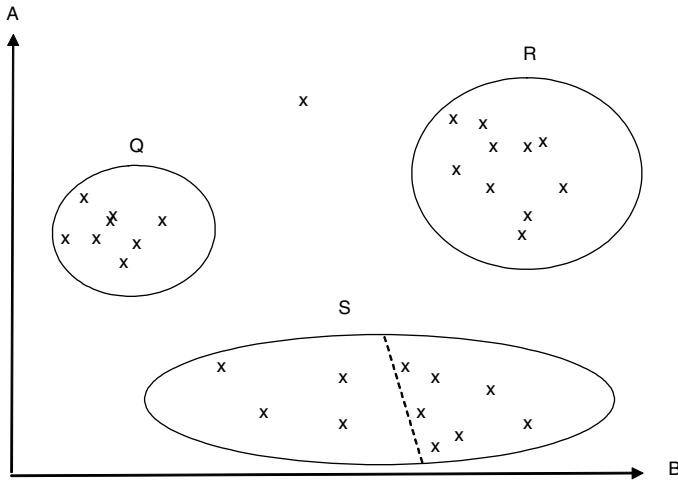
Moreover, we cannot be sure that the most important institutions and organisations in the economy are taken into account since only two or three features are singled out as crucial. Another problem in using these *ad hoc* procedures is that little attempt is made to link the selected criteria with the full range of other economic institutions and organisations that structure the society in question. Such approaches can be justified, however, when the analyst cannot get adequate data on the society's full range of economic institutions, although the results must be accepted with caution.

My approach is different. I start with variables representing a series of institutions and organisations and define each as a dimension of the economic system, an approach that allows multidimensional statistical techniques to be employed. I focus on institutions and organisations that might have an important impact on the economy (at least as suggested by case studies of particular nations) and that are related to the system of property or distribution. Given these various dimensions, I then look for cluster of nations with similar configurations of economic institutions and organisations.

More technically, I calculate the distances in this multidimensional space defined by the selected institutions and organisations between each society and every other society and employ a pattern recognition technique called cluster analysis to determine which societies are nearest to each other. This allows us, in turn, to determine which institutions and organisations cluster together. The clusters of economies which appear most similar define, in turn, the different types of economic systems.

Chart 1 presents a simplified example in a two-dimensional space. To be very concrete, let us assume that all economic systems have different degrees of only two institutions, protection of the job rights of workers (A) and government expenditures as a ratio of GDP (B). For each society we can designate this configuration by an *x* on the graph. At first glance, the economies fall into three clusters, whose boundaries I have sketched. These clusters are bunched somewhat differently, with cluster Q the most tightly packed; and cluster S, the most loosely. One economy, in the upper middle portion of the graph, does not fall clearly into any of the three clusters; different estimations of the clusters might put it in either Q or R. This kind of problem arises more often when examining the economies of agricultural societies than for either foraging (hunting, gathering, and fishing) societies or industrial/service economies.<sup>3</sup>

<sup>3</sup> For a similar analysis carried out with foraging, agricultural societies, and industrial/service economies, see Pryor (2003, 2005a, b).



**Chart 1:** Designation of clusters.

*Note:* The axes A and B, respectively, represent the two possible institutions in this simplified example, relative protection of job rights of workers and the ratio of government expenditures to GDP. The position of each society (×) is determined by the degree to which these two institutions play a part in its economy. Q, R, and S represent the derived clusters.

The chart illustrates another problem, however, that is quite common in this procedure. Might it be better to consider cluster S as really two clusters, with the dashed line marking the boundaries of each? We face a tradeoff. On the one hand, according to the principle of Occam's razor, entities (types of economic systems in this case) should not be multiplied unnecessarily, and we should have as few clusters as possible.<sup>4</sup> On the other hand, increasing the number of clusters reduces the error in defining each cluster. Obviously, if we have 29 societies (each with an × on the graph) we will have no error in our description if we define 29 clusters. If, however, eight x's cluster near each other and another nine x's are also close to each other, but not near to the first group, and a third group of 11 x's also form a distinct cluster, we lose relatively little information about the grouping of economic systems by reducing the 29 clusters to three.

At this juncture it is useful to draw upon the principle of the *minimum description length* (MDL), defined by Jorma Rissanen (1989, p.79ff.; 2001), who worked from a 'stochastic information-theoretic' approach. This

<sup>4</sup>In modern information theory, this means that we should keep theoretical complexity to a minimum, where complexity is defined mathematically as the number of bits used to represent the model generating the clusters. A model with 10 parameters, each with two possible values (1 or 0), would be of equal complexity to a model with one parameter with 1,024 potential values.



technique combines the positive value of additional information gained by increasing the number of clusters with the negative value of the resulting greater theoretical complexity (both determined using information theory) and thereby arrives at a description length used for determining the optimal number of clusters. More specifically, the first step is to calculate the description length associated with each of various numbers of clusters for the data under examination. The optimal number of clusters (minimum description length) is simply where the gain in information is exactly counterbalanced by the increase in complexity. A computer program (written by Bruce Maxwell and described in Maxwell *et al.*, 2002) allows an easy calculation of the MDL over a range of numbers of clusters. Once the optimal number of clusters (the number of economic systems) is selected, the program prints out the list of economies in each, as well as certain properties of each cluster, so that we can gain a quantitative idea of how often particular institutions occur together.

The optimal number of clusters, I must emphasise, may not be very helpful if the isolated clusters are very broad (in terms of Chart 1, if the lines defining the clusters encompass a very large area). A useful statistic to investigate this matter compares the variance of the distance of every point (a nation) with every other point in the sample and then compares it with the variance of the distance of every point within a given cluster with every other point in the same cluster for each cluster. Such a calculation tells us how much of the differences among the various economies is explained by the calculated clusters. Thus, if the MDL calculations determines that three clusters are optimal and if, within each of these clusters, all countries have the same institutional configuration, the reduction-in-variance is 100 percent. By way of contrast, if the points to be clustered are randomly scattered over the multidimensional space, the calculated reduction-in-variance may be only 10 percent and distinctive economic systems cannot be meaningfully determined, a situation that, fortunately, I did not encounter. It is worth noting, however, that the percentage of variance explained by the clusters (economic systems) is less for the developing economies than industrial/service economies.

I suspect that two reasons can explain why the economic systems of developing nations have received so little attention. Among the developing nations more societies appear close to the border separating economic systems. Moreover, the systems boundaries are relatively broad and explain less of the variance than we might wish. Although I do not believe that any economist has carried out a cluster analysis to arrive at these conclusions, analysts have intuitively perceived that the delineations of economic systems in developing nations would be difficult.



Finally, I must emphasise that although such an approach appears ‘objective, it cannot be used heedlessly. The analyst must base the calculations on unbiased information and select judiciously the dimensions by which the clusters are to be defined (in the example of Chart 1, relative protection of the job rights of labour and the ratio of government expenditures to the GDP). The number of relevant institutions and organisations is, of course, related to the complexity of the economy.

### **The sample and derivation of the clusters**

I define ‘developing countries’ as those nations which, in 1990, had a per capita GDP of \$10,000 or less in a set of common prices (Maddison, 2003). For this group I collected data on economic institutions and organisations that were not highly specialised in one sector and that had some relevance either to distribution of goods and services or to property relations in many sectors. For such data I could draw upon three different types of indicators: Some of the 31 indicators I selected were derived from the laws defining the institutions (for instance, various types of government regulations or patent protection); from statistics about their activities (for instance, centralisation of banks or the percentage of workers covered by collective bargaining contracts); while still others, from expert opinion (for instance, the level of the economy – enterprise, industry, or national – at which wages are most often bargained or the competitiveness of the economic environment). When I present the summary data below, I also specify which of the three types of indicators are involved.<sup>5</sup>

These indicators (discussed in detail in Appendix A) are grouped into five categories: (a) those reporting the ways in which the product market functioned in the different countries (nine indicators); (b) those describing aspects of the labour market and various types of labour institutions (five indicators); (c) those referring to various characteristics of enterprises and the system of production (four indicators); (d) those detailing the relative importance of different types of governmental activities (six indicators); (e) and, finally, those reporting particular aspects of the financial system (seven indicators). Some of these indicators overlap in certain respects, but all reflect what I believe to be crucial aspects of the property and distribution institutions of the societies.

<sup>5</sup>The development of these indicators has been carried out principally by four teams: a primarily Harvard-based team composed of a shifting combination of Juan Botero, Simeon Djankov, Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W Vishny; a World Bank team composed of Daniel Kaufmann, Aart Kraay, M Mastruzzi, and Pablo Zoldo-Lobatón; an OECD team of Giuseppe Nicoletti, Stefano Scarpetta, and Olivier Boylaud; and an independent team of Peter A Hall and David Soskice. My intellectual debts to them should be readily apparent.



**Table 1:** Developing countries in the 1990 sample arranged by economic system (clusters)

Chile	Argentina	Brazil?	Bangladesh
Korea, South	Bolivia?	Costa Rica?	Dominican Republic
Malaysia	Colombia	Egypt	El Salvador?
South Africa	Ecuador	Ghana?	Honduras
Taiwan	Indonesia?	India?	Nigeria
Thailand	Mexico	Jamaica	Pakistan
	Panama	Jordan	Senegal
	Paraguay	Kenya	Tanzania
	Peru	Mauritius	Uganda
	Philippines?	Morocco?	Zambia?
	Turkey?	Sri Lanka	
	Uruguay	Trinidad	
	Venezuela	Tunisia	

*Note:* The derivation of the economic systems is discussed in the text. The question mark indicates that the country is placed in that cluster less than 70 percent of the runs and, therefore, must be considered as lying close to the border with another cluster. None of the Marxist nations in transition to a more market-oriented economy are included in this calculation.

Relevant data could be found for 41 nations (listed in Table 1). The minimum description length analysis pointed toward four clusters (economic systems) as optimal number. After specifying this number, the cluster analysis program then randomly selects the same number of nations, and calculates in an iterative fashion the nations in those clusters. Given the randomness of the initial selection of nations, it was necessary to run the program a number of times and average the results. For this reason I also specified that each run of the program include the average of 100 such calculations and each calculation be carried out with 200 iterations. Then I carried out such a procedure 10 times, so that a total of 1000 different sets of calculations of the clusters were used in the reported results. If a given nation did not fall at least 70 percent of the time in one cluster, I considered it to lie away from the core of the cluster and towards the boundary. In Table 1, I add a question mark after the name of these 10 countries and, for the estimation of the properties of each economic system in Table 2, exclude them from the calculation.<sup>6</sup>

The percentage of countries close to the boundaries of the clusters among the developing nations is much larger than in a similar analysis of industrialised nations. Nevertheless, the results seem serviceable for further exploration.<sup>7</sup>

<sup>6</sup> I do, however, include them in the calculation of the income elasticity since the economic system is not a variable in the equation.

<sup>7</sup> More specifically, the cluster analysis explains 36 percent of the average multidimensional variance of the distance of one country from all others in the sample.

**Table 2:** Defining characteristics of economic systems of developing nations in 1990

	Features		Indicator	Range	Devel. elasticity	Averages				Total sample
						Economic systems				
	A	B			Business oriented	Labour oriented	Statist	Traditional		
<i>Product market</i>										
1.	X	D	Freedom from product market regs.	-0.56-1.2*	<b>0.40</b>	<b>0.677</b> <sup>+</sup>	0.393	0.039	-0.394	0.150
2.	L	P	Protection of patent rights	0-1	-0.01	0.566	<b>0.342</b> <sup>-</sup>	0.445	0.481	0.444
3.	L	P	Good legal environment for markets	-1.1-1.2*	<b>0.51</b>	0.753	<b>-0.150</b> <sup>-</sup>	0.112	<b>-0.644</b> <sup>-</sup>	-0.030
4.	LS	PD	Barriers to starting new businesses	0-upwds	<b>-0.51</b>	0.259 <sup>-</sup>	0.548	0.578	2.269	0.874
5.	S	D	Ratio of government subsidies to GDP	0-1	0.40	0.018	0.023	0.017	<b>0.006</b> <sup>-</sup>	0.017
6.	S	D	Foreign trade barriers	0-1	0.26	0.864	0.792	0.772	0.703	0.779
7.	XL	D	Freedom to set prices	0-1	<b>0.20</b>	0.658	<b>0.472</b> <sup>?</sup>	0.534	0.489	0.530
8.	X	D	Product market competition	0-1	-0.03	0.667	0.519	0.628	—	0.595
9.	X	PD	Presence of business clusters	0-1	0.15	<b>0.547</b> <sup>+</sup>	<b>0.386</b> <sup>-</sup>	0.417	—	0.457
<i>Labor market</i>										
1.	L	D	Legal protection: workers, employment	0-1	0.08	<b>0.464</b> <sup>-</sup>	<b>0.627</b> <sup>+</sup>	0.480	0.517	0.528
2.	L	D	Legal protection: labor bargaining rights	0-1	<b>0.24</b>	0.516	<b>0.733</b> <sup>+</sup>	0.435	0.415	0.537
3.	X	D	Level of economy where wages bargained	0-1	0.00	<b>0.000</b> <sup>-</sup>	0.333	0.500	<b>0.167</b> <sup>-</sup>	0.235
4.	S	D	Union density	0-1	0.07	0.145	0.185	<b>0.227</b> <sup>+</sup>	0.128	0.170
5.	S	DP	Years of education of average worker	0-upwds	<b>0.32</b>	7.461	6.604	<b>6.597</b> <sup>+</sup>	3.451	5.974
<i>Production and business sector</i>										
1.	L	P	Shareholder rights	0-1	<b>-0.25</b> <sup>?</sup>	<b>0.700</b> <sup>+</sup>	0.457	0.450	0.800	0.568
2.	L	P	Creditor rights	0-1	-0.26	0.350	<b>0.217</b> <sup>-</sup>	0.400	0.400	0.318
3.	L	P	Significant worker role in firm's decisions	0-1	-0.03	0.111	0.075	0.200	0.080	0.118
4.	S	P	Inequality of land holdings	0-1	0.07	<b>0.468</b> <sup>-?</sup>	<b>0.827</b> <sup>+</sup>	0.694	0.595	0.691

**Table 2:** Defining characteristics of economic systems of developing nations in 1990

Features		Indicator	Range	Devel. elasticity	Averages				Total sample	
A	B				Economic systems					
				Business oriented	Labour oriented	Statist	Traditional			
<i>Government sector</i>										
1.	S	D	Government share of total consumption	0–1	<b>0.18</b>	0.188	<b>0.134</b> <sup>-?</sup>	<b>0.191</b> <sup>+</sup>	<b>0.117</b> <sup>-</sup>	0.157
2.	S	D	Ratio of govt. transfers to GDP	0–1	0.25	0.026	0.046	0.038	—	0.036
3.	L	D	Coverage of social security system	0–1	<b>0.56</b>	0.543	<b>0.640</b> <sup>+</sup> ?	0.406	0.353	0.494
4.	X	P	Security of government contracts	0–1	<b>0.26</b>	0.780	0.605	0.573	0.419	0.588
5.	X	P	Security from govt. expropriations	0–1	<b>0.11</b>	0.786	<b>0.646</b> <sup>-?</sup>	0.631	0.563	0.651
6.	S	P	Importance, state owned enterprises	0–1	-0.17	0.124	0.092	<b>0.230</b> <sup>+</sup>	0.128	0.136
<i>Financial sector</i>										
1.	L	D	Central bank independence	0–1	-0.05	0.399	0.432	0.400	0.455	0.423
2.	L	PD	Restrictions on bank activities	0–1	0.00	0.400	<b>0.611</b> <sup>+</sup> ?	0.250	0.460	0.479
3.	L	D	Openness of external capital flows	0–4	<b>0.25</b>	0.515	<b>0.689</b> <sup>+</sup>	<b>0.378</b> <sup>-</sup>	0.458	0.521
4.	S	PD	Comprehensiveness of accounting stds.	0–1	0.01	<b>0.720</b> <sup>+</sup>	<b>0.489</b> <sup>-?</sup>	—	—	0.584
5.	S	P	Bank concentration	0–1	-0.13	0.520	0.570	<b>0.775</b> <sup>+</sup>	0.725	0.652
6.	S	D	Relative size of financial sector	0–upwds	<b>0.35</b>	<b>1.265</b> <sup>+</sup> ?	<b>0.293</b> <sup>-</sup>	0.577	0.311	0.595
7.	S	D	Stock market activity/bank activity	0–upwds	0.40	<b>0.835</b> <sup>+</sup> ?	0.235	0.237	<b>0.112</b> <sup>-</sup>	0.347
Number of countries in the 'core' of the economic system						6	9	8	8	
Average per capita GDP (1990 \$)						6453	5200	3977	1280	4111

*Notes:* Features: Column A designates if the indicator is based on legal definitions (L), statistics (S), or expert (X) or some combination thereof. Column B designates whether the indicator refers primarily to property (P) or distribution (D). A dash in columns 4–8 indicates no data or data only for one country available. *Range:* An asterisk designates that the range is not absolute, but is based on the highest and lowest recorded values. *Development elasticity* designates the percentage change of the indicator resulting from a 1 percent change in the per capita GDP. The second through fifth data columns present averages (excluding the countries specified in the text). The level of significance is determined when per capita income is held constant, and the sign of the coefficient in this regression is designated in a superscript. A statistically significant result at the 0.05 level is boldfaced, with a question mark placed as a superscript if the level of significance is 0.10. Sources and exact meaning of the data are discussed in Appendix A.





## RESULTS OF THE CLUSTER ANALYSIS

### The economic systems

Table 2 presents the averages of the four economic systems for the 31 institutional characteristics. The economic systems are arranged in terms of their declining average per capita GDP. The table shows not only the average values of the institutional variables but also whether the system was significantly different from the other systems when per capita GDP is held constant, a procedure that allows us to separate out the effects of the relative level of economic development from the system itself.<sup>8</sup> For instance, the countries with the 'business-oriented' system had the most favourable legal environment for a market economy, a characteristic, which increases as the level of economic development rises. If we factor out the impact of the higher level of development of the nations with business-oriented economic systems; however, this particular institutional feature does not distinguish the nations with this type of economic system. In brief, such a table allows us to label the systems and see how they differ from each other.

The countries with a business-oriented economic system had a significantly higher per capita GDP than the other developing nations in the sample. Holding the level of per capita GDP constant, these nations were significantly different from the others by their greater freedom from product market regulations, lower barriers for starting new businesses, less legal protection of workers and their employment, bargaining for wages at the enterprise level (rather than at the industry or national level), more shareholder rights in comparison to those of management, more equal distribution of agricultural land, greater comprehensiveness of accounting standards for business, a larger financial sector (in comparison to the GDP) and a larger role of the stock market in enterprise finance than in the other countries. As a result of their higher level of economic development, they also had a better legal environment for markets, greater freedom to set prices, more product market competition, and greater security both of government contracts and from governmental expropriation. From Table 1, we see that among the six countries in this cluster were four in east Asia (South Korea, Malaysia, Taiwan, and Thailand), one in

<sup>8</sup> More specifically, I calculated regressions of the following type:  $EcSys = a + b \text{ DevLev} + c I$ , where  $EcSys$  is a dummy variable, which is equal to 1 if the society has the specified economic system and equal to 0 if it does not;  $DevLev$  is the level of economic development;  $I$  is the indicator under examination; and  $a$ ,  $b$ , and  $c$  are the calculated regression coefficients. For 31 indicators and 4 economic systems, this required calculating 124 regressions. Since the variable to be explained is equal to either to 1 or 0, I used a probit regression technique.



Latin America (Chile), and one in Africa (South Africa). We might conjecture that the nations with this economic system would have experienced faster growth than the other nations in the sample, an expectation that is validated below.

At the opposite extreme were the countries with the 'traditional' economic system. These nations had a significantly lower per capita GDP than the other nations. Among their relatively few distinguishing characteristics were a worse legal environment for market activity and a relatively small role of the stock market. Owing to their lower level of economic development, they also had more government regulation, higher barriers for starting new businesses, a lower union density, more poorly educated workers, less security of government contracts or from governmental expropriation, and a smaller financial sector. From Table 1, we see that among the eight nations lying near the core of this economic system, four were in Sub-Saharan Africa (Nigeria, Senegal, Tanzania, and Uganda); two, in the Caribbean area (Dominican Republic and Honduras); and two, in Asia (Bangladesh and Pakistan).

The nations with a 'labour-oriented' economic system had significantly higher legal protection of workers and their employment, as well as collective bargaining rights. They also had significantly worse protection of patent rights, a poor legal environment for markets, few rights of creditors, greater inequality of land holdings, greater coverage of social security, more restrictions on bank activities, less comprehensive accounting standards, a smaller financial sector but, surprisingly, fewer restrictions on flows of foreign capital. They also had a lower ratio of government consumption expenditures to the GDP than the other nations. Among the nine nations lying near the core of this economic system, all were in Latin America (Argentina, Columbia, Ecuador, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela).

Finally, the nations with a 'statist' economic system had relatively few significant differences with the other nations. These did, however, include more educated workers, a higher government share in total consumption, greater importance of state-owned enterprises, less openness to external capital flows, higher concentration of banks, and a higher union density (share of non-agricultural workers in labour unions). From Table 1, we see that among the eight nations lying at the core of this economic system, three were in the Circum-Mediterranean area (Egypt, Lebanon, and Tunisia); two, in the Caribbean area (Jamaica and Trinidad); two in Sub-Saharan Africa (Kenya and Mauritius); and one in Asia (Sri Lanka).



### General features of the results

Aside from information about the relevance of particular institutional indicators for the four economic systems, several more general aspects of the results deserve brief attention.

- *Size of the government sector:* The government, of course, played an important causal role in many of these institutional indicators. Nevertheless, the six indicators for the size of the government sector turned out to be no more likely to distinguish the types of economic systems in a statistically significant manner than any of the other four classes of indicators. Indeed, the highest percentage of distinguishing features occurred in the various indicators of the financial sector. This suggests that the traditional focus on the size of the government sector as an exclusive way of categorising an economic system is misplaced, and that we must pay just as much attention to other economic institutions.
- *Unimportant indicators:* A number of the indicators, which I had assumed would differentiate between the economic systems, did not play such a role. Among others, these included the ratio of government subsidies to the GDP, product market competition, a significant role of workers in firm decision-making, the ratio of governmental transfers to the GDP, the security of government contracts, and central bank independence.
- *Diffusion of economic institutions:* Countries with close geographical proximity or historical ties often have the same types of economic institutions. This is seen most clearly in the countries with a labour-oriented system: all nine of the nations within the core of the system are in Latin America, where both the geographical and historical criteria for ‘closeness’ are met. As noted above, two-thirds of the countries with a business-oriented system are in Asia; one-half of the countries with a traditional economic system were in Africa (and five-eighths were former British colonies); and in the countries with a statist economic system, three-quarters were former British colonies.
- *Systemic differences with industrialised nations:* When a similar analysis is carried out for the OECD nations with roughly the same institutional indicators (Pryor, 2005), the particular configuration of institutions defining the four economic systems are very different. This seems to be due to two factors. First, the various institutions have quite different income elasticities so that they change at different rates as per capita GDP rises. Second, the functional requirements for the operation of an industrialised economy are different from those of semi-industrialised or agricultural societies. In brief, the economic system of a nation is not frozen in time; rather, the configuration of its institutions changes as its level of per capita GDP rises.



- *Systemic change*: The results reported in Tables 1 and 2 are for 1990. At least in industrialised nations, the configuration of economic institutions comprising the economic system changes considerably in the medium-run. For instance, the Scandinavian nations are distinguished by higher ratios of government consumption expenditures to the GDP than other nations in the OECD, but this particular systemic characteristic only became apparent in the late 1950s. The stability of the institutional composition of the economic systems in the developing nations is yet to be determined. Given the rapidly changing world economic environment, however, some medium-run changes appear inevitable.

### IMPACT OF THE ECONOMIC SYSTEMS

To what extent does the economic system have an important impact on the performance of the economy? Table 3 presents data on two aspects of performance, namely average annual growth of per capita GDP, prices (as measured by the GDP deflator) and volatility of the GDP.

For investigating the impact of the economic system on economic growth, I hold constant the per capita GDP at the beginning of the period under investigation, the average level of education of those in the labour force in the same year, and the average ratio of gross fixed capital investment to the GDP

**Table 3:** Performance indicators for economic systems of developing nations

Economic systems	Of developing nation			
	Business-oriented	Labour oriented	Statist	Traditional
Average annual growth of per capita GDP, 1980–2000	<b>4.07%</b> <sup>+</sup>	0.98%	1.48%	1.14%
Average annual growth of GDP deflator, 1980–2000	7.12	<b>44.46%</b> <sup>+</sup>	9.83	16.61
Volatility of GDP (standard deviation of annual growth rate)	3.49	<b>6.41%</b> <sup>+</sup>	3.79	3.45

*Note:* Regressions of the following form were calculated:  
 $Indicator = a + b \text{ GDP/capita} + c \text{ Economic system (1 if the system was of the specified type, 0 if otherwise)} + d \text{ other variables}$ . For the growth equation the other variables included in the regression were per capita GDP in 1980, average years of education of those in the labour force in 1980, and the average ratio of gross fixed investment to the GDP from 1975 through 1995. For the inflation and volatility equations, only the per capita GDP in 1980 was included. A bold-faced coefficient indicates statistical significance at the 0.05 level; and the plus in the subscript indicates that it is significantly higher than the others. The data for per capita GDP, the GDP deflator, and the average ratio of gross fixed investment to the GDP came from the World Bank (2004). The per capita GDP in a common set of prices for 1980 came from Maddison (2003). The average years of education of workers in 1980 came from Prezeworski *et al.* (2000a, b).



in the 1975–1995 period (to take account of lags in the completion of investment projects). These variables, according to Levine and Renelt (1992), constitute the minimum variables necessary to hold constant in testing a growth model.<sup>9</sup> This kind of test, in which the groups of institutional variables constituting an economic system are held constant, has certain advantages over testing the impact of a single institution.

According to this test, the countries with a business-oriented economic system have a significantly higher rate of economic growth; and the countries with a labour-oriented economic system have a significantly higher degree of inflation and production volatility. These results have two important implications:

- *Growth related to the level of economic development:* The fact that the nations with this economic system have a significantly higher initial GDP per capita than the other developing nations may well be a function of the fact that their economic system has provided the environment for faster growth in the past as well.
- *Systemic contrast with industrialised nations:* In contrast to the developing countries, none of the four economic systems of OECD nations are associated with higher growth in the 1980–2000 period (Pryor, 2005). This suggests (i) that the economically developed nations all had a business-oriented economic system during the course of their industrialisation; (ii) or that the slow-growing OECD nations adopted some of the economic institutions of their fast-growing neighbours to raise their own growth rates.

Table 3 also shows that the nations (all from Latin America) with a labour-oriented economic system have much higher inflation and GDP volatility than the nations with other economic systems. This result is puzzling, because none of the variables reflecting their financial institutions (Table 2) points in this direction. For instance, the independence of their central banks is roughly the same as the other nations. Two interpretations of these negative results come immediately to mind:

- *Impact of other variables:* The institutions constituting the economic system may have had nothing to do with the results. Rather, the higher inflation may have been the result of bad policies, occasioned, perhaps, by a combination of common political factors. These could stem from the fact that all were former Spanish colonies and featured large income inequalities, high corruption, strong leftist ideologies, and economies with a heavy emphasis

---

<sup>9</sup>Rodrik *et al.* (2002) present various regressions showing that to explain economic growth, geographical, and trade variables have little explanatory power when institutional variables are also included. Given the relatively small size of my sample, I have, therefore, omitted such variables in my regression exploring the determinants of economic growth.



on mineral extraction or export of agricultural goods produced on plantations (reflected in their greater inequality of land ownership). The greater GDP volatility might be a function of particular aspects of their foreign trade or poorly chosen trade or exchange rate policies. A detailed exploration of these topics would, unfortunately, take us far from the major theme of this short essay.

- *Impact of sub-systemic institutions*: These results may be the consequence of institutions which I have not included in Table 2, either because no data were available or because they seemed too specialised to include in the analysis. In order to explore the latter possibility, it would be necessary to examine particular institutions dealing with fiscal and monetary policy in much greater detail than the relatively macroview that I have provided.

## A BRIEF OVERVIEW

In this preliminary exploration of economic systems of developing nations, I define such systems in terms of clusters of complementary institutions, using 31 indicators of economic institutions to derive four quite different economic systems. To a considerable extent, the countries with particular economic systems are either geographically close to each other or were colonies of the same nation. These economic systems appeared to have had an impact on certain indicators of economic performance, for instance, the countries with the business-oriented economic system, which had the most secure property rights and other features most conducive for economic growth, also had the highest growth rate of per capita GDP, other factors held constant. The countries with a labour-oriented economic system (all in Latin America) had the highest rate of inflation and production volatility.

## REFERENCES

- Barro, RJ and Lee, J-W. 1994: Data Set for a Panel of 138 Countries, <[www.nber.org/pub/barro.lee](http://www.nber.org/pub/barro.lee)>.
- Barth, JR, Caprio Jr, G and Levine, R. 2001: Banking systems around the globe: do regulation and ownership affect performance and stability? In: Mishkin, FS (ed). *Prudential supervision: What Works and What Doesn't*. Chicago. University of Chicago Press, Chicago.
- Botero, J, Djanksv, S, La Porta, R, Lopez-de-Silanes, F and Shleifer, A. 2003: The regulation of labor  
NBER Working paper no. 9756.
- Cukierman, A. 1992: *Central Bank strategy, credibility, and independence: Theory and evidence*. MIT Press: Cambridge, MA.
- Deininger, K and Olinto, P. 2000: *Asset distribution, inequality, and growth*. World Bank Working paper 2375.



- Demirgüç-Kunt, A and Levine, R. (eds). 2001: *Financial structure and economic growth: A cross-country comparison of banks, markets, and development*. MIT Press: Cambridge, MA.
- Djankov, S, La Porta, R, Lopez-de-Silanes, F and Shleifer, A. 2002a: *Courts: The Lex Mundi project*. NBER Working paper 8890.
- Djankov, S, La Porta, R, Lopez-de-Silanes, F and Shleifer, A. 2002b: The regulation of entry. *Quarterly Journal of Economics* 117(1): 1–39.
- Engerman, S and Sokoloff, KL. 2003: Institutional and non-institutional explanations of economic differences NBER Working paper no. 9989. National Bureau of Economic Research: Cambridge, MA.
- Ginarte, JC and Park, WG. 1997: Determinants of patent rights: A cross-national study. *Research Policy* 26: 283–301.
- Grassby, R. 1999: *The idea of capitalism before the industrial revolution*. Rowman & Littlefield: Lanham, MD.
- Gwartney, JD and Lawson, RA. 1997: *Economic freedom of the world: 1997 annual report*. Fraser Institute: Vancouver.
- Hoselitz, BF. 1960: Theories of stages of economic growth. In: Hoselitz, et al (eds). *Theories of Economic Growth*. Free Press: Glencoe, Illinois, pp. 193–239.
- Kaufmann, D, Kraay, A and Mastruzzi, M. 2003: Governance indicators for 1996–2002. <[www.worldbank.org/wbi/governance/pubs/govmatters3.html](http://www.worldbank.org/wbi/governance/pubs/govmatters3.html)>.
- La Porta, R, Lopez-de-Silanes, F, Shleifer, A and Vishny, RW. 1996: *Law and finance*. NBER Working paper no 5661.
- La Porta, R, Lopez-de-Silanes, F, Shleifer, A and Vishny, RW. 1997: *Legal determinants of external finance*. NBER Working paper 5879.
- Levine, R and Renelt, D. 1992: A sensitivity analysis of cross-country growth regressions. *American Economic Review* 82: 942–964.
- Maddison, A. 2003: *The world economy: historical statistics*. OECD: Paris.
- Marcano, G. 1998: Measuring central bank independence: A tale of subjectivity and its consequence. *Oxford Economic Papers* 50: 468–492.
- Maxwell, BA, Pryor, FL and Smith, C. 2002: Cluster analysis in cross-cultural research. *World Cultures* 13: 22–39.
- North, DC. 1998: Economic performance through Time. In: Eicher, CK and Staatz, JM (eds). *International Agricultural Development*. Johns Hopkins University Press: Baltimore, 3rd Edition. pp. 78–90.
- Pryor, FL. 2003: Economic systems of foragers. *Cross-Cultural Research* 37: 393–427.
- Pryor, FL. 2005: Defining economic systems, forthcoming.
- Przeworski, A, Alvarez, ME, Cheibub, JA and Limongi, F. 2000a: *Democracy and development*. Cambridge University Press: New York.
- Przeworski, A, Alvarez, ME, Cheibub, JA and Limongi, F. 2000b: Database. <<http://pantheon.yale.edu/~jac236/Research.htm>>.
- Quinn, D and Toyota, M. 2003: Unpublished monograph.
- Republic of China. 2003: Statistical abstract of national income in Taiwan area, Republic of China <<http://61.60.106.83/nis/enisd.htm>>.
- Rissanen, J. 1989: *Stochastic complexity in statistical inquiry*. World Scientific Publishing Co.: Singapore.
- Rissanen, J. 2001: Information, complexity and the MDL principle. In: Punzo, LF (ed). *Cycles, growth and structural change: Theories and empirical evidence*. Routledge: New York.
- Rodrik, D, Subramanian, A and Trebbi, F. 2002: Institutions rule: The primacy of institutions over geography and integration in economic development Centre for Economic Policy Research paper no. 3643, London.



- Sachs, JD and Warner, A. 1995: Economic reform and the process of global integration. *Brookings Papers on Economic Activity* 1: 1–119.
- United Nations. 2000: *National account statistics: main aggregates and detailed tables, 1996–1997*. UN: New York.
- World Bank. 1995: *Bureaucrats in business: The economics and politics of government ownership*. Oxford University Press: New York.
- World Bank. 2004: *World development indicators 2004*. <www.worldbank.org>.
- World Economic Forum. 1991: *World competitiveness report 1991*. World Economic Forum: Lausanne and Geneva.
- World Economic Forum. 2000: *The global competitiveness report 2000*. Oxford University Press: New York.

## APPENDIX A: SOURCES OF SYSTEM INDICATORS FOR DEVELOPING NATIONS

Most of the institutional variables are roughly the same as those used in a study of economic systems of the OECD nations (Pryor, 2005). Unfortunately, some of these had to be omitted because data were not available for more than half of the countries in the 41 nation samples. The numbering of the variables correspond to those used in Table 2.

### Market institutions

1. *Regulation of product market*: The data refer to the 1996 data and come from subjective indicators reported by Kaufmann *et al.* (2003).
2. *Protection of patent rights*: This index, calculated for 1990 by Ginarte and Park (1997), of five different categories of patent laws containing a total of 16 legal provisions of the patent laws in 110 nations. They combined these indicators using subjective weights. The authors also tried to measure actual protection by listing the number of complaints about patent enforcement in foreign countries that were made to the US. Trade Representative or the US International Trade Commission in the period from 1986–1995; none of the OECD nations, however, were on the list, even though complains were made about the provisions of the patent laws in some of these nations. The data in my index are based on slightly revised data supplied by Walter G. Park. The Ginarte–Park scale, which ran from 0 through 5, was transformed into a scale running from 0 through 1.
3. *Good legal environment for markets*: This indicator consists of four components, each rescaled from 0 (poor) to 1 (good) and equally weighted, (a) One component, calculated by Djankov *et al.* (2002a) is a measure of the costs of legal procedures in the late 1990s and, in turn,



consists of two parts of a hypothetical law case revolving around a commercial dispute to collect the funds from a check that had been returned for non-payment, namely the number of procedural actions of the plaintiff and the number of days required to resolve the case. (b) A second component is a measure of the efficiency of the judicial system, which represents an average from 1980 to 1993 of investor assessments. The data come from La Porta *et al.* (1996) and were drawn from the data base of Business International Corporation, a risk-rating agency, (c) The third component is an assessment of the risk of contract repudiation by the government. The original data are an average for April and October between 1982 and 1995 and are reported by La Porta *et al.* (d) The final component is an index of the 'rule of law,' as presented by Kaufmann *et al.* (2003).

4. *Barriers for starting new businesses:* This indicator for 1999 focuses on the total costs (both in time and money) of meeting the various legal requirements to be able to set up a new business (defined in terms of a 'standardised firm'). These costs are measured as a percentage of the average per capita GDP. The legal requirements include safety and health, environmental, tax, labour, and various screening regulations. The data come from Djankov *et al.* (2002b).
5. *Ratio of governmental subsidies to GDP:* These data are the average ratios of governmental subsidies to the domestic economy to the GDP, both in current price, for the period from 1988 through 1992. For the various countries the data come from United Nations (2000). For Taiwan, the data come from Republic of China (2003).
6. *Foreign trade barriers:* This is a weighted index of four series, the first three of which are drawn from Barro and Lee (1994) and the final from Sachs and Warner (1995). These series (with their weights in parentheses) are: black market premium, 1985–1989 (5%); average import tariffs on capital and intermediate goods (45%); average quota coverage (45%); and presence of governmental export marketing boards (5%).
7. *Freedom to set prices:* This series is the arithmetic average of two estimates, both for 1990. The first is variable 3.40 from the World Economic Forum (1991), variable 3.40; and represents the 'freedom of companies to set competitive prices,' with a high score representing fewer controls. The second comes from Gwartney and Lawson (1997, p. 244) and represents 'the extent countries imposed price controls on various goods and services,' with a high score representing few controls. Their calculation is based partly on their own data and partly on data from Price, Waterhouse.
8. *Product market competition:* This indicator represents the percentage of business respondents in 1999 agreeing with the statement 'Competition in



the local market is intense and market shares fluctuate constantly.' The data, drawn from indicator 10.01 (local competition) from World Economic Forum (2000), are based on a 7-point scale and were rescaled from 0 to 1.

9. *Pervasiveness of business clusters*: The data come from a survey of business people who were asked whether they strongly agreed or disagreed with the following statement: 'Clusters are present in most international industries and include not only suppliers, but specialised institutions such as university research programs and training provides.' The answers refer to 1999 and are drawn from World Economic Forum (2000), variable 10.16.

### Labour market

1. *Protection of labour and employment*: This is a summary index of 29 different indicators of protection of labour and employment. The data refer to 1997 and come from Botero *et al.* (2003); they have been rescaled to run from 0 to 1.
2. *Strength and protection of labour in collective bargaining*: This index consists of 16 indicators of labour union power, measures for legal protection of the right to collective bargaining, legality of strikes, absence of procedural restrictions to the right to strike, compulsory third-party arbitration during disputes, and absence of strong powers of employers during collective dispute. The data come from Botero *et al.* (2003); I have, however, omitted their indicators of labour's right to appoint directors or to participate in worker councils. This index has also been rescaled to run from 0 to 1.
3. *Dominant level of wage bargaining*: These data from the ILO (1997, pp. 246–247) reflect their evaluation of the dominant level of bargaining over the 1985–1995 decade: 0 = company level, 0.5 = sector level, and 1.0 = national level. When the ILO designated several levels, the scores were averaged.
4. *Union density*: Data on union membership as a percentage of the non-agricultural labour in 1990 or, in some cases, mid-1990s come from International Labour Office (1997–1998). Where data were available, I averaged union density for 1985 and 1995; in cases where the data for the former year were not available, I used the latter data only.
5. *Years of education average worker*: These data come from Przeworski *et al.* (2000a, b), who drew upon an unpublished data of Surjit S Bhalla.



## ENTERPRISES AND PRODUCTION

1. *Shareholder rights (investor protection)*: This index, by La Porta *et al.* (1996, 1997) is composed of five equally weighted rights of stockholders: against management including rights that support the voting mechanisms against interference by the insiders (anti-director rights that make it easier to vote out directors), and remedial rights (for instance, suing directors). The original data, which run from 0 through 5, are rescaled to run from 0 to 1. The data from the two cited articles are slightly different in several cases from those published on their website: <http://iicg.som.yale.edu/data/datasets.shtml>.
2. *Creditor rights*: This index, by La Porta *et al.* (1996), is composed of five equally weighted rights of creditors in contrast to rights of management in management during bankruptcy proceedings. To the four listed by the authors I have added a fifth, which specifies whether the company must hold a monetary reserve for creditors that is at least 10 percent of the capital of the firm. The series was rescaled to run from 0 to 1.
3. *Worker participation in firm decisions*: This index includes three indicators, each scored 0 or 1 for presence of the characteristic: Workers and/or union have a right to appoint members to the boards of directors (weight = 40%). Worker councils (institutions of employees and workers created for discussion of a company's policies affecting workers at the company level; the employer has sole rights to decide on operations of company, but must negotiate and decide all matters affecting workers within the framework of the council) mandated by law (weight = 4). Legal rights to participate in management written into the nation's constitution (= 10% if expressly granted by constitution; = 6.7% if described as a matter of public policy or public interest, or mentioned within the constitutional chapter on rights; = 3.3% if participation in management is otherwise mentioned in the constitution) (weight = 20%). The original data pertain to 1997 and come from Botero *et al.* (2003); however, I have used a different weighting system than they.
4. *Inequality of land holdings*: These are Gini coefficients from Deininger and Olinto (2000).

## Government

1. *Government share of total consumption*: These data are the share of current government consumption of goods and services to total private and governmental consumption. For the various countries the data come from



- United Nations (2000). For Taiwan, the data come from Republic of China (2003).
2. *Government domestic transfer payments as a percent of current GDP*: These are the average ratios to GDP of total transfers excluding subsidies and transfers abroad for 1988–1992. The data come from United Nations (2000). For Taiwan, the data come from Republic of China (2003).
  3. *Coverage of social security system*: These data draw on 12 provisions of the various legal provisions for governmental old age, disability, sickness, death, and unemployment benefits that are calculated by Botero *et al.* (2003).
  4. *Security of government contracts*: This variable, drawn from Demirgüç-Kunt and Levine (2001) (and originally from the International Country Risk Guide) indicates the relative safety from a ‘modification in a contract taking the form of a repudiation, postponement, or scaling down’ due to ‘budget cutbacks, indigenization pressure, a change in government, or a change in government economic and social priorities.’ The score ranges from 0 to 1 with a low score indicating a high risk; and the data are an average from 1982 to the early 1990s.
  5. *Security from governmental expropriation*: This variable, also drawn from Demirgüç-Kunt and Levine (2001) (and originally from the International Country Risk Guide) indicates the security from ‘outright confiscation’ or ‘forced nationalization’. The score ranges from 0 to 1 with a low score indicating a high risk; and the data are an average from 1982 to the early 1990s.
  6. *Importance of state-owned enterprises in nonagricultural economic activity*: These data come from World Bank (1995, Table A-2). These data represent an estimated average from 1986 to 1991.

## Financial sector

1. *Central bank independence*: As Marcano (1998) warns us, measuring central bank independence contains some subjective elements, both in establishing the criteria for independence and then measuring them. My index, based completely on data from Cukierman (1992, pp. 396–411) has three major components (weights in parentheses):
  - a. *Legal (formal) independence* (45%) is an unweighted index of six indicators of legal independence during the 1980s. These include his four variables about top personnel, the bank’s monopoly position in making monetary policy, and the bank’s official objectives regarding price stability.



- b. *Policy tools and independence* (45%) is an unweighted index seven indicators of policymaking independence during the 1980s. These included authority in decision-making in disputes with other government agencies and six indicators of various constraints on lending.
- c. *Annual turnover of central bank directors* (10%) is, according to Cukierman, a crude indicator of the lack of actual political independence of the central bank director. The data come from his estimates (p. 384) for the period from 1950 to 1989 and rescaled to run from 0 to 1, where the value points in the same direction as the other two components of the index.
2. *Restrictedness of bank activities*: The original data set is based on a determination of whether banks can engage in insurance underwriting and selling, real estate investments, and can own and control nonfinancial firms. I have combined these three scales and have rescaled the combined results so that they run from 0 to 1. The data come from the CD-rom accompanying Demirgüç-Kunt and Levine (2001) (and originally came from Barth *et al.* 2001).
  3. *Openness of external finance*: These data are averages for the period 1988–1992 and come from Dennis Quinn and Maria Toyota (2003), who have used IMF data on restrictions on the capital account and have coded two equally weighted indicators: openness of inward receipts and of outward payments.
  4. *Completeness of accounting reports to the public*: An index created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items in their balance sheets and income statements. The data come from the CD-data rom accompanying Demirgüç-Kunt and Levine (2001) and were rescaled to run from 0 to 1. The original data were drawn from research published by the Center for International Financial Analysis and Research, Inc.
  5. *Bank concentration*: This is the share in 1990 of the assets of the three largest banks in total banking assets, rescaled from 0 to 1. The data come from the CD-rom accompanying Demirgüç-Kunt and Levine (2001).
  6. *Relative size of financial system*: This is the ratio of deposit money bank assets and stock market capitalisation for the period from 1980 to 1995. The results are rescaled with 0 and 1 representing, respectively, the lowest and highest and lowest shares of any country in the sample. These data come from the 'overall size variable' on the CD-rom accompanying Demirgüç-Kunt and Levine (2001).
  7. *Stock market activity/bank activity*: This series has two components, both reflecting the size of the stock market to the size of the banking sector. The first part measures size in terms of total capitalisation (stock market) or



assets (banks). The second part measures size in terms of total ratio of the annual value of stock traded (stock market) and annual claims of private sector by deposit money banks (banks). The two series were scaled from 0 to 1, with the end points representing, respectively, the lowest and highest ratios. The data are for the period 1980–1995. The data come from the CD-ROM accompanying Demirgüç-Kunt and Levine (2001).