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Credibility of Rules and Economic Growth: Evidence from a Worldwide Survey of the Private Sector

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A business environment characterized by "incredible" rules such as unclear property rights, constant policy surprises and reversals, uncertain contract enforcement, and high corruption most likely translates into lower investment and growth. The literature on growth and policies has suggested different ways to measure the relevant uncertainties. This article proposes a new measurement approach based on firm-level surveys and an indicator of the "credibility of rules." Using data from a private sector survey conducted in 73 countries and covering more than 3,800 enterprises, standard cross-country growth and investment analysis indicates that low credibility of rules is associated with lower rates of investment and growth. The survey was designed to capture local entrepreneurs' views of the predictability of changes in laws and policies, of the reliability of law enforcement, of the impact of discretionary and corrupt bureaucracies, and of the danger of policy reversals due to changes in governments. Confidence in the reliability of the survey results opens many avenues for further research that could exploit the micro dimensions of this data set.

The general idea that an unstable political framework reduces growth is hardly controversial. It would be expected that a business environment characterized by "incredible" rules such as unclear property rights, constant policy surprises and reversals, uncertain contract enforcement, and high corruption would translate into lower investment and growth. In such an uncertain environment, entrepreneurs are reluctant to commit resources especially in projects that are characterized by large sunk cost (see, for example, Dixit and Pindyck 1994 and Aizenman

and Marion 1993). This reaction of the private sector not only reduces aggregate investment but also distorts the allocation of resources and reduces economic growth.

How to measure the relevant uncertainties is less clear. Early papers in the recent wave of empirical growth analysis include measures of political instability, proxied for instance by the number of coups and revolutions (see, in particular, the influential paper by Barro 1991; Brunetti 1997 provides an updated survey). Such measures have the advantage of being universally observable and therefore objective, but they are also very crude measures of the kind of uncertainties that affect private entrepreneurs. Subjective measures have been used to proxy for property rights insecurity and corruption by relying on country risk indicators according to expert opinions (see Mauro 1995 and Knack and Keefer 1995). These indicators are likely to reflect the concerns of entrepreneurs more closely than the overall measures of political instability. However, they are based on the perceptions of country experts and not on those of local entrepreneurs themselves.

In this article we propose a new measurement approach based on firm-level surveys, and we construct an indicator of the "credibility of rules" to be used in growth regressions. The data are from a private sector survey conducted in 73 countries and covering more than 3,800 enterprises.[1] The survey was designed to capture local entrepreneurs' views of the predictability of changes in laws and policies, of the reliability of law enforcement, of the extent of discretionary and corrupt bureaucracies, and of the danger of policy reversals due to changes in governments. We test this indicator and its various components in standard cross-country growth and investment regressions and find that low credibility of rules is associated with lower rates of investment and growth.

Section I discusses how the existing measures of political uncertainty might be incomplete and why we designed a different measurement. Section II presents the survey approach, gives information on the firms surveyed, and discusses possible problems with selection bias and measurement error. Section III explains the construction of the overall indicator of credibility and its various subindicators and gives some regional information on them. Section IV presents the empirical approach, and section V provides details on the results of growth and investment regressions for the credibility indicator and its components for the 51 countries with reliable data.

I. A NEW APPROACH FOR MEASURING POLICY UNCERTAINTY

At the most general level, we can distinguish two channels through which policies may influence economic growth: efficiency and reliability. The first branch of

1. The data for 67 countries in the *World Development Report 1997* survey can be downloaded from www.worldbank.org/html/prdmg/grlhweb/wdr.html. An expanded data set of the *World Development Report* survey, including surveys that were conducted after completion of the report, can be downloaded from www.unibas.ch/wwz/wifor/survey.

the existing literature on policies and growth focuses on the efficiency of policies. It explains differences in growth with differences in macro- and microeconomic policies. Many studies have found fiscal policy variables (for example, Easterly and Rebelo 1993), monetary policy variables (for example, Fischer 1993), or trade policy variables (for example, Edwards 1992) to be related to differences in cross-country growth performance. For a survey, see Barro and Sala-i-Martin (1995), and for a comparative analysis, see Levine and Renelt (1992).

The second branch of the literature emphasizes the reliability of policies, that is, their stability and uncertainties surrounding their implementation. Within this branch, most studies use "objective" measures of political instability to proxy for uncertainties. For example, Alesina and others (1996) and Barro (1991) use average numbers of violent political events such as riots or political assassinations. Londregan and Poole (1990) and Cukierman, Edwards, and Tabellini (1992) use the number of orderly or disorderly changes in government or an estimated probability of a change in government. Aizenman and Marion (1993), Easterly and Rebelo (1993), and Hausmann and Gavin (1996) use the standard deviations of inflation or tax incomes as indicators of the volatility of macroeconomic policies.

Clearly, these "objective" variables are incomplete proxies for the variety of institutional uncertainties that confront entrepreneurs in their daily business operations. For instance, these proxies disregard more micro aspects that entrepreneurs consider important such as uncertainties in tax legislation, large and unpredictable changes in labor regulations, uncertain and arbitrary decisions of courts, or unclear proceedings in the allocation of all sorts of licenses. Borner, Brunetti, and Weder (1995) provide reports on interviews on these issues conducted with private business owners in 10 developing countries. Two examples help make the point. The first case is Thailand (see Brunetti and Weder 1995). Indicators of political instability that are based on counting the number of coups would characterize Thailand as a country with high political uncertainty. But the interviews we conducted with entrepreneurs suggest that the coups did not affect the credibility of the institutional framework and that entrepreneurs did not fear wide-ranging policy swings or reversals. The second and opposite case is Peru in the 1980s (see Keefer 1990). Despite the apparent stability of the government, legislation through executive and emergency decrees was so extensive that the private sector faced a much more uncertain environment than could be captured by measures of the number of changes in government. These examples highlight two problems of all objective indicators of political instability as proxies for policy reliability. First, they concentrate on events that the private sector may not perceive as important. Second, they fail to capture many uncertainties that the private sector may perceive as crucial.

In essence, the disadvantage of "objective" variables is that they measure instability and not uncertainty. Instability can be objectively observed, whereas uncertainty is subjective to the individual investor. Because investment decisions are based on the subjective evaluations of entrepreneurs, a variable that captures

these perceptions would seem more promising for explaining investment and growth.

The subjective measures of political uncertainty that have been used in the literature are based on the opinions of external experts (see Mauro 1995 and Knack and Keefer 1995). Companies that specialize in assessing a country's risks provide such indicators. The drawback of these indicators is that they are aimed at foreign firms, and the problems for foreign investors and local entrepreneurs may differ quite substantially. For instance, to a large degree these indicators reflect risks of nationalization and impediments to repatriation of revenues that do not arise in similar intensity for domestic entrepreneurs. Also, the degree to which investors are kept abreast of regulatory changes may differ significantly for multinational and domestic firms. Finally, multinationals may receive very different treatment from politicians and bureaucrats than the large majority of small local firms. Given that in most countries the development of the private sector depends mainly on local investors, an indicator based on their percep-tions would seem a promising way to obtain a more encompassing measurement of political uncertainty and its effects on investment and growth.

In this article, we aim to fill this gap by constructing a measure of the credibil-ity of rules based on a survey of domestic entrepreneurs in the private sector. In this respect, our survey extends to the cross-country level the research based on country-level interviews with domestic firms done at the World Bank (see, for example, Stone, Levy, and Paredes 1992).

II. THE PRIVATE SECTOR SURVEY

This section gives a short overview of the survey. We discuss the structure of the questionnaire, explain how the survey was implemented, give an overview of the characteristics of responding firms, and discuss possible problems in the data.

Questionnaire, Survey Implementation, and Sample Characteristics

The survey instrument was developed over the past five years. It started with a large number of interviews of private entrepreneurs in different Latin Ameri-can countries that resulted in a short multiple-choice questionnaire and small-scale survey. Results are reported in Borner, Brunetti, and Weder (1995). Based on the results of this pretest, the survey instrument was refined and expanded. In preparation for the survey sponsored by the *World Development Report 1997: The State in a Changing World*, the expanded questionnaire was discussed with a number of country experts at the World Bank and the International Finance Corporation. After these discussions, the questionnaire was revised and final-ized, resulting in the survey presented in this article.

The purpose of the questionnaire was to capture all relevant forms of policy uncertainties related to the development and enforcement of laws, regulations, and policies. In preparatory interviews and tests of this questionnaire, firms that were confronted with unpredictable state action usually came up with very dif-

ferent examples of such uncertainties. These answers ranged from surprising executive decrees to unpredictable court decisions, from uncertainty on the severity of tax audits to unpredictable customs procedures, and from policy reversals whenever a new minister was appointed to uncertainty about whether a bribe would lead to blackmailing by government officials. The questionnaire tries to cover the most important forms of such uncertainties.

The main part of the questionnaire consisted of 25 mainly multiple-choice questions. We use a subset of these questions in the empirical sections of this article. In addition, we asked respondents to judge the situation 10 years ago; this allows us to construct 10-year averages of the indicators used in the econometric work.

The process of implementing the survey began in August 1996 and ended in June 1997. At the survey's conclusion, 73 countries had participated (see appendix A). In 60 of these countries, the questionnaires were distributed through World Bank missions or local consulting companies. The survey of industrial countries was undertaken at the end of 1996, as a separate exercise under our direction at the University of Basel. It covered nine European countries: Austria, France, Germany, Ireland, Italy, Portugal, Spain, Switzerland, and the United Kingdom. Because the coverage of Southeast Asian economies proved to be rather poor, we later conducted surveys using the same method in four additional economies: Hong Kong (China), the Republic of Korea, Singapore, and Thailand.

Companies were selected based on stratification criteria including firm size, geographic location within the country, and foreign participation. The survey was conducted by direct mail where possible. In countries where mail delivery systems were unreliable, hand delivery was used. The average rate of return on the mailed survey in developing countries was 30 percent. The response rate in high-income industrial countries was considerably lower, at 18 percent on average. For regional details on rates of response, see Brunetti, Kisunko, and Weder (1997). Due to various constraints, not all the country surveys were based on a random sample of companies. Nevertheless, the stratification criteria should ensure a reasonable coverage.

Table 1 shows regional averages and some descriptive statistics on response patterns. Over all countries, the average number of questionnaires is 53, and the median is 50. The average number of responses is lowest in the industrial countries. The minimum number of questionnaires is 13, and the maximum is 124. Appendix B provides regional information about the standard deviations and coefficients of variation.

Table 2 gives regional information including the distribution of size, geographic location, and ownership of responding firms. About 40 percent of firms are small (less than 50 employees), about 30 percent are large (more than 200 employees), and the remaining 30 percent are of medium size. The sample, therefore, is reasonably diversified according to this criterion. The regional decomposition shows considerable variation in the percentage of firm size. This reflects differences in economic development and in the development of the private sec-

Table 1. *Descriptive Statistics of Returned Questionnaires, by Region*
(numbers)

Region	Surveyed		Returned questionnaires in each region			
	Countries	Firms	Average	Median	Minimum	Maximum
All countries	73	3,883	53	50	13	124
High-income industrial countries	11	254	23	20	14	56
South and Southeast Asia	7	337	48	43	29	88
Middle East and North Africa	3	109	36	42	15	52
Central and Eastern Europe	11	771	70	70	46	114
Latin America and the Caribbean	9	474	53	47	17	87
Sub-Saharan Africa	22	1,288	59	48	13	124
Commonwealth of Independent States	10	650	65	62	31	91

Note: See appendix A for the list of countries by region.
Source: Authors' calculations.

tor itself. Services and manufacturing are represented about equally, and agriculture is underrepresented in all regions. Regarding geographical location, there is a bias toward the capital city; however, in many countries this reflects the distribution of firms. About two-thirds of the surveyed companies do not have any foreign participation—they are purely local. This contrasts with earlier subjective measurements of investment climate that concentrate entirely on the perceptions of multinational firms.

Possible Problems with Selection Bias and Measurement Error

Before turning to empirical results, we discuss possible selection biases and measurement errors in our approach. In most cases, we believe that they do not seriously affect the quality of the results.

A possible source of selection bias is that for most of the 60 countries surveyed by World Bank contacts, governments had to be asked if firms in their country could participate in the survey. This introduces the problem that the countries with low credibility and low growth could choose not to participate in the survey because their governments might fear having this fact exposed. This bias would exclude the worst cases of low credibility. Not all countries were asked in the first place because the most important constraint in determining which countries were covered was the internal administrative capacity of the World Bank to organize the survey in a short time. Of the countries that were asked, in only five did the government explicitly choose not to participate and in five more there was no official response or the resident mission preferred not to conduct the survey; this bias, therefore, does not seem to be too strong.

The fact that the questionnaire involved some delicate questions on the firm's relationship with the government might be another source of selection bias. There could be two possible problems. Entrepreneurs who are completely ex-

Table 2. *Description of Responding Companies, by Region*

(percentage of all responses in the region)

Indicator	All countries	High-income industrial countries	South and Southeast Asia	Middle East and North Africa	Central and Eastern Europe	Latin America and the Caribbean	Sub-Saharan Africa	Commonwealth of Independent States
Company size (number of employees)								
Fewer than 50	39	26	32	35	40	27	43	61
Between 50 and 200	31	45	28	35	28	29	31	23
More than 200	28	28	40	26	31	42	24	15
Industry								
Manufacturing	49	69	52	51	48	41	46	35
Services	41	27	43	42	41	47	39	57
Agriculture	8	2	4	1	10	9	11	7
Location of management								
Capital city	48	23	49	42	37	59	58	61
Large city	28	29	24	40	36	25	26	21
Small city or countryside	21	48	11	12	27	13	13	18
Foreign participation								
Yes	35	33	47	34	26	30	42	25
No	63	65	52	62	73	67	56	73
Exports								
Yes	49	73	55	37	51	44	46	28
No	51	27	45	63	49	56	54	72

Note: See appendix A for the list of countries by region.
Source: Authors' calculations.

asperated with their government might take the opportunity to vent their anger, while entrepreneurs who feel reasonably happy might choose not to answer the survey. In this case, the bias would be consistently to underestimate credibility. The other possibility is that entrepreneurs who are desperate have given up and do not even care to submit a questionnaire. This would lead to an overestimation of credibility. Similarly, some entrepreneurs might fear that their government could discover their responses and therefore present too rosy a picture. In order to temper this fear, we conducted the survey anonymously and asked for no company-specific data that would allow identification of the responder. All in all, the direction of a possible company-level bias is not evident: it could lead to under- as well as overestimation of our variables of interest.

A more serious source of measurement error could be that purely local entrepreneurs might not have the experience to put their answers in relation to the situation in other countries. About 60 percent of the total sample of enterprises were purely local, that is, they had no foreign participation and did not export. Of course, entrepreneurs might still have had good knowledge of other countries (through imports, or they might even have been nationals of other countries), but in the smaller enterprises the entrepreneurs probably were purely local. On the one hand, this is exactly what we wanted, because the threat of uncertainty would affect a local entrepreneur's investment behavior in the country. On the other hand, if serious, this problem would compromise the comparability of country surveys, and we would not find any association between uncertainty indicators and economic performance, even though such an association might exist. The fact that we do find strong associations between economic performance and indicators derived from the survey is, therefore, indirect proof of the validity of the instrument.

Another possible measurement problem would occur if the survey were nothing but an indirect measure of the private investment rate. It is conceivable that entrepreneurs would respond to questions about the business environment with their general gut feeling, that their responses would reflect not their opinion about the institutional framework but rather whether they invested or not. In this case, we would expect that entrepreneurs would respond more or less the same to all questions. In other words, if the firm had recently invested in the country, the entrepreneur would answer all the questions positively and vice versa. It seems that this was not the case. Entrepreneurs seemed to distinguish clearly between, say, the perceived political stability and the level of corruption. The degree of differentiation in the answers of the same respondents to different questions is comforting.

III. THE CREDIBILITY INDICATOR AND ITS COMPONENTS

This section explains the construction of the credibility indicator and presents some regional statistics on the credibility indicator and its components.

Construction of the Credibility Indicator

The multiple-choice questions used in the survey had six standardized responses. For instance, in question number 1 entrepreneurs were asked whether they had to cope regularly with unexpected changes in rules and regulations that could seriously affect their business. The six answers ranged from changes in laws and policies are "completely predictable" to "completely unpredictable." Based on such standardized answers, we constructed indexes for every question. Entrepreneurs were also asked to rate the situation 10 years ago. We constructed a 10-year average using the average of the response for 10 years earlier and the value for 1996 (for the transition economies, only 5-year averages were considered). For the indicators of security of property, judiciary enforcement, and perceived political instability, we asked directly how the rating was 10 years ago. For the indicators of predictability and corruption, we asked one overall question on developments over time.

The credibility indicator was designed as a broad measure of the reliability of the institutional framework averaging the information from many such questions. It encompasses several different sources of uncertainty in the interaction between the government and the private sector and summarizes them into one global indicator. The credibility indicator is constructed as the simple mean of the average answers for five subindicators. For the individual questions used to construct these subindicators, see appendix C. The five subindicators are the following.

- *Predictability of rule making.* This subindicator measures the extent to which entrepreneurs have to cope with unexpected changes in rules and policies and whether they expect their governments to stick to announced major policies. It encompasses the degree to which entrepreneurs are usually informed about important changes in rules and whether they can voice their concerns when planned changes affect their business. It is the average of questions 1–4.
- *Subjective perception of political instability.* This subindicator reflects whether government changes (constitutional and unconstitutional) are perceived to be accompanied by far-reaching policy surprises that could have serious effects on the private sector. It is the average of questions 5 and 6.
- *Security of persons and property.* This subindicator reflects whether entrepreneurs feel confident that the authorities would protect them and their property from criminal actions and whether theft and crime represent serious problems for business operations. It is the average of questions 7 and 8.
- *Predictability of judicial enforcement.* This subindicator captures the uncertainty arising from arbitrary enforcement of rules by the judiciary and whether such unpredictability presents a problem for doing business. It is question 9.

- *Corruption.* This subindicator asks whether it is common for private entrepreneurs to have to pay some irregular additional payments to government agents to get things done. It is question 10.

Regional Statistics for the Credibility Indicator and Its Components

Figure 1 shows regional averages of the credibility indicator, which ranges in value from 1 (no credibility) to 6 (perfect credibility). The high-income industrial countries overall prove to have the most favorable institutional framework. Their firms clearly assign the highest credibility rating. The high-growth South and Southeast Asian countries have very good credibility ratings as well. At the lower end of the regional averages, we find the Commonwealth of Independent States and the Sub-Saharan African countries.

Table 3 gives more detailed information by showing the regional averages for all of the five subindicators that are used to calculate the overall credibility indicator. Again, the high-income industrial countries have the best rating for all of these indicators. This is especially apparent for corruption, where this region has an extremely favorable rating of 5.04, which is much higher than the next-best value of 4.12 for the South and Southeast Asian region. For all of these indicators, the region of the Commonwealth of Independent States has very low ratings. In particular, political violence and the lack of a reliable judiciary seem to be major problems in this region.

Figure 1. *Regional Averages of the Credibility Index*
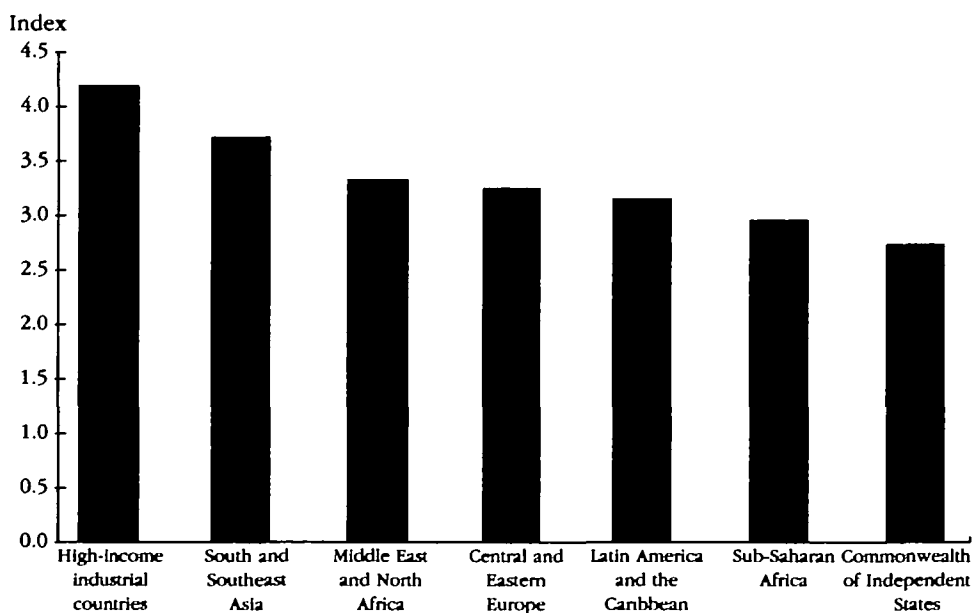
Note: See appendix A for the list of countries by region.
Source: Authors' calculations.

Table 3. *Regional Averages of the Credibility Indicator and Its Components*

Region	Credibility indicator	Components of the credibility indicator				
		Predictability	Political stability	Violence	Reliability of judiciary	Lack of corruption
All countries	3.23	3.21	3.25	2.80	3.04	3.86
High-income industrial countries	4.15	3.85	4.27	3.64	3.98	5.04
South and Southeast Asia	3.69	3.55	3.56	3.28	3.94	4.12
Middle East and North Africa	3.28	3.36	2.86	3.57	2.61	4.01
Central and Eastern Europe	3.22	2.93	3.51	2.72	3.14	3.82
Latin America and the Caribbean	3.12	3.17	3.60	2.43	2.63	3.79
Sub-Saharan Africa	2.91	3.06	2.57	2.59	2.76	3.55
Commonwealth of Independent States	2.69	2.87	2.91	2.16	2.35	3.16

Note: See appendix A for the list of countries by region. See text section III and appendix C for details on the components of the credibility indicator.
Source: Authors' calculations.

As instructive as such regional comparisons are, we cannot derive any strong conclusions because a lot of information on cross-country differences is averaged out. Therefore, in the next sections we turn to an econometric analysis of the data set that can take advantage of individual-country ratings.

IV. SPECIFICATION AND DATA SOURCES FOR THE EMPIRICAL ANALYSIS

In the empirical analysis, we use cross-sectional regressions to evaluate the hypothesis that high credibility is associated with higher growth rates and higher rates of investment. Starting with the contributions by Kormendi and Meguire (1985) and in particular Barro (1991), this has become the standard method for analyzing the sources of cross-country differences in economic performance.

Our indicator and subindicators of credibility are added as additional explanatory variables in the most common specification of such growth regressions. This specification regresses the average rate of growth on the starting levels of per capita gross domestic product (GDP) and human capital. The starting level of per capita GDP controls for the convergence effect predicted by neoclassical growth theory. That is, the higher initial GDP per capita is, the lower the growth rate is, other things being equal, because decreasing returns to capital reduce the growth effects of additional capital. According to this argument, a country starting with a low level of GDP should grow faster and gradually converge to the levels of industrial countries. The problem with this approach is that it does not work for country samples that include developing and industrial countries (see Barro and Sala-i-Martin 1992). Mankiw, Romer,

and Weil (1992) have argued that the neoclassical growth model predicts not absolute but rather conditional convergence. Each country does converge, not to a common steady state but to its own steady state, which depends on country characteristics, most prominently the level of human capital. As a consequence, more recent cross-country growth regression analysis has included, as we do, at least one measure of human capital as an additional right-hand variable in the basic specification.

In addition to testing the credibility measure in this basic specification, we check whether the results are sensitive to adding individual additional explanatory variables that are frequently used in the empirical growth analysis. The specification we test, therefore, has the following form:

(1) $\text{Growth}8092 = a_0 + a_1 \text{ GDP80} + a_2 \text{ SEC80} + a_3 \text{ Credibility} + a_4 \text{ } X + u.$

Growth8092 is the average per capita growth rate for 1980–92 calculated from the updated data set provided by Summers and Heston (1991). GDP80 is per capita GDP in 1980 from the same data set. SEC80 is the enrollment ratio in secondary school in 1980 from the UNESCO *Statistical Yearbook*. Credibility is the average indicator calculated from our survey approach for the last decade. X is an additional variable that is drawn from a set of standard explanatory economic and political variables for economic growth; appendix D provides precise definitions and data sources.

We use 1980–92 because this is the most recent period for which Summers and Heston data are available on the Internet. A potential problem with this approach is that this period includes the "lost decade" in the aftermath of the debt crisis. Other empirical growth studies have used averages for longer periods, arguing that institutional variables are fundamental country characteristics that do not change much over time. To test if the time period has any effect on our results, we run regressions with macro variables for 1970–92. The fit of the regressions and the significance of the credibility indicator improve in every case. As in all cross-sectional growth analysis, this raises the issue of causality. Due to the notorious problem of finding adequate instruments, this issue is very hard to address. For a discussion, see Mankiw (1995).

As control variables, we include the following frequently used measures: the average rate of inflation in 1980–92 calculated from World Bank data, the average rate of government consumption as a percentage of GDP in 1980–92 provided by Summers and Heston, the average degree of openness to international trade measured as the sum of exports and imports as a percentage of GDP in 1980–92 calculated from Summers and Heston, and the average level of liquid liabilities in GDP in the 1980s from King and Levine (1993).

In addition we analyze how credibility affects economic growth. Credibility can influence growth either by affecting the accumulation of capital or by affecting the allocation of capital. We try to disentangle these effects by separately estimating investment and growth regressions. The investment regressions measure the effect of credibility on accumulation.

V. REGRESSION RESULTS

This section presents the results of the cross-country regression analysis in four steps. The first subsection presents the basic results of the overall credibility indicator in the growth and investment regressions for 51 countries for which we have reliable data (see appendix A for the country list).[2] The second subsection individually tests each of the five subindicators that together make up the credibility indicator. The third subsection compares the credibility indicator with other political variables. Finally, in the last subsection, we do some exploratory analysis with data from 18 transition economies in our sample.

Basic Growth and Investment Results

We first test the relation between the aggregate indicator of credibility and average per capita growth rates for 1980–92. A higher value of this indicator means a more credible institutional framework. Therefore we expect a positive relationship. The simple scatter plot is shown in figure 2.

Table 4 displays multivariate regression results. The first regression shows that the sign of the coefficient is positive in the basic specification that contains GDP per capita and secondary school enrollment as additional right-hand variables. The coefficient is significant at the 1 percent confidence level. Regressions 2 to 5 test whether this result is sensitive to the inclusion of additional explanatory variables. Controlling for the rate of government consumption and the rate of inflation, the coefficient of the credibility indicator has the expected positive sign and remains highly significant. If we include the extent of international trade, the coefficient of the indicator is significant only at the 5 percent confidence level. In the last regression, we control for the level of financial depth, meaning the level of liquid liabilities of the banking system. In this case, credibility is not significant. However, credibility and financial depth are highly correlated (simple correlation of 0.80). Appendix E provides the correlation matrix of the survey indicators with all economic variables.

The high correlation between credibility and financial depth might be no coincidence because the two variables might be measuring the same phenomenon. Clague and others (1996) suggest that the depth of the financial system can also be interpreted as a variable of contract enforcement. The less confidence there is in contract enforcement, the less intermediation occurs through the banking system. If this interpretation is correct, the fact that credibility becomes insignificant when controlling for liquid liabilities of the banking system is not a cause for great concern. Therefore, in the following regressions, we exclude this measure as a control variable.

2. We drop one country (Jordan), although we have the necessary macroeconomic data because it is an extreme outlier in several dimensions. Including Jordan leads to specification problems because the main control variables (GDP in the base year and secondary school enrollment) are not significant. The significance of the credibility indicator is also reduced a bit when including this country, but all results nevertheless hold.

Figure 2. *Growth in Per Capita GDP and the Credibility Indicator for 49 Countries, 1980–92*

Average annual growth in per capita GDP (percent)

Credibility indicator
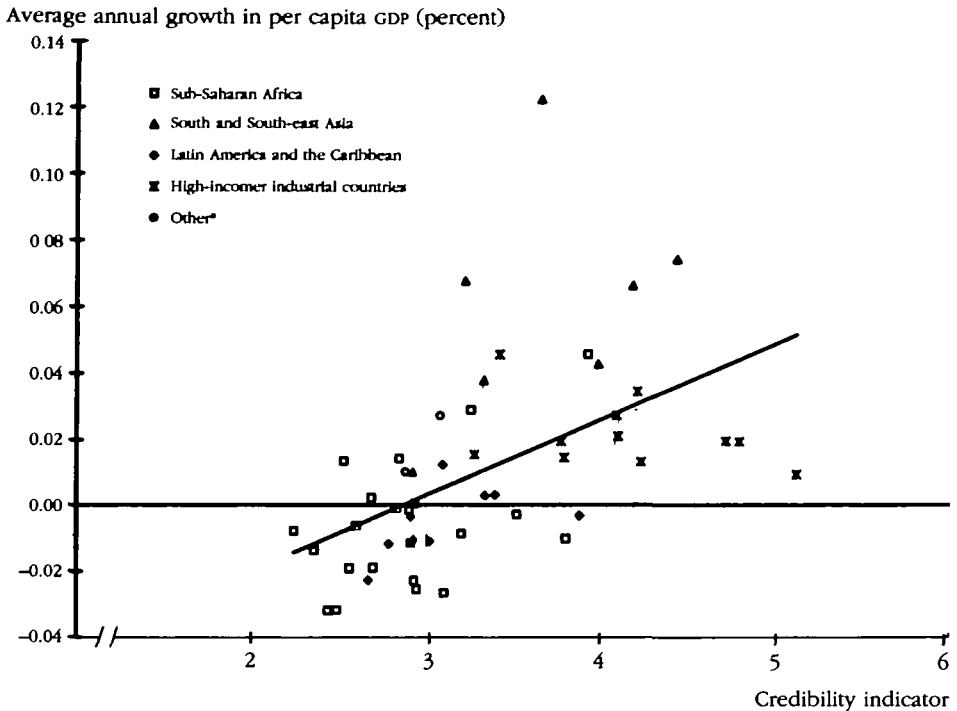
Note: Each point represents a country. See appendix A for the list of countries by region; all the countries with asterisks are included except Morocco and Turkey.

a. Other includes the Middle East and North Africa and the Commonwealth of Independent States.

Source: Authors' calculations; see appendix D.

We proceed to check whether credibility has a positive impact on growth through higher rates of investment. Figure 3 shows that investment and credibility are highly correlated.

Table 5 presents regression results for the impact on investment using the same set of variables as in the growth regression. Regression 1 in table 5 shows that the coefficient of credibility has the expected positive sign and is significant at the 1 percent level. Together with the variables for initial human capital and GDP per capita, this minimal specification explains 65 percent of the cross-country variation in investment rates. The result proves to be quite robust, as can be seen in the extended specifications tested in regressions 2 to 4. When controlling for government consumption and inflation, credibility remains positive and significant at the 1 percent level of confidence. If we include the extent of international trade, the significance of the credibility indicator drops to the 5 percent level.

The investment regressions test for the effect of credibility on the accumulation of resources. In order to test the allocation channel, we include investment as a control variable in the growth regression. Credibility keeps its positive sign

Table 4. *The Impact of the Credibility Indicator on Growth in Per Capita GDP for 51 Countries, 1980–92*

Variable	1	2	3	4	5
Constant	−0.07***	−0.06**	−0.06***	−0.06***	−0.04*
	(−3.88)	(−2.66)	(−3.24)	(−3.5)	(−2.1)
GDP per capita in 1980	−2.65 E–6*	−2.69 E–6*	−2.97 E–6**	−2.2 E–6	−3.68 E–6**
	(−1.90)	(−1.92)	(−2.06)	(−1.6)	(−2.6)
Secondary school enrollment rate in 1980	0.037*	0.029	0.043**	0.036*	0.05**
	(1.85)	(1.34)	(2.06)	(1.87)	(2.5)
Government consumption/ GDP average in 1980–92		−0.0005			
		(−0.94)			
Inflation rate average in 1980–92			−0.01		
			(−1.55)		
Trade in 1980–92		.		0.0001**	
				(2.03)	
Liquid liabilities in 1980–90					0.038**
					(2.28)
Credibility indicator	0.022***	0.022***	0.021***	0.017**	0.08
	(3.35)	(3.36)	(2.95)	(2.48)	(1.04)
Number of observations	51	51	49	51	47
Adjusted R^2	0.35	0.35	0.37	0.39	0.38

Note: The dependent variable is growth in GDP per capita in 1980–92. The regressions are estimated using ordinary least squares. See appendix A for the list of countries by region and appendix D for variable descriptions. *t*-statistics are in parentheses.
  * Significant at 10 percent.
 ** Significant at 5 percent.
  *** Significant at 1 percent.
Source: Authors' calculations; see appendix D.

in these regressions but becomes insignificant (results not shown). This result suggests that higher credibility affects growth mainly through investment, that is, by raising the rate of capital accumulation.

Subcomponents of the Credibility Indicator

Table 6 presents results for the individual subcomponents of the credibility indicator for the basic growth regressions in 1980–92 and 1970–92. Each entry in this table presents the results from a separate equation. We only report the coefficients and *t*-statistics of the institutional variable, but in the regression we control for GDP per capita in 1980 and secondary school enrollment in 1980. We have shown that credibility affects growth mainly through the accumulation channel. Table 6 also shows results for the investment regressions.

Three of the five subcomponents are significant in all regressions. The most robust one is the indicator of predictability of judiciary enforcement, which is significant at the 1 percent level in all regressions. The indicator of the security of persons and property rights is highly significant in both growth regressions and remains significant in the investment regressions, albeit at a lower level of confidence. The reverse is true for the indicator of perceived political instability. The indicator of the predictability of rule making is the most fragile of all the subcomponents. It is only significant in the growth regression for the longer

Figure 3. *Investment and the Credibility Indicator for 49 Countries, 1980-92*
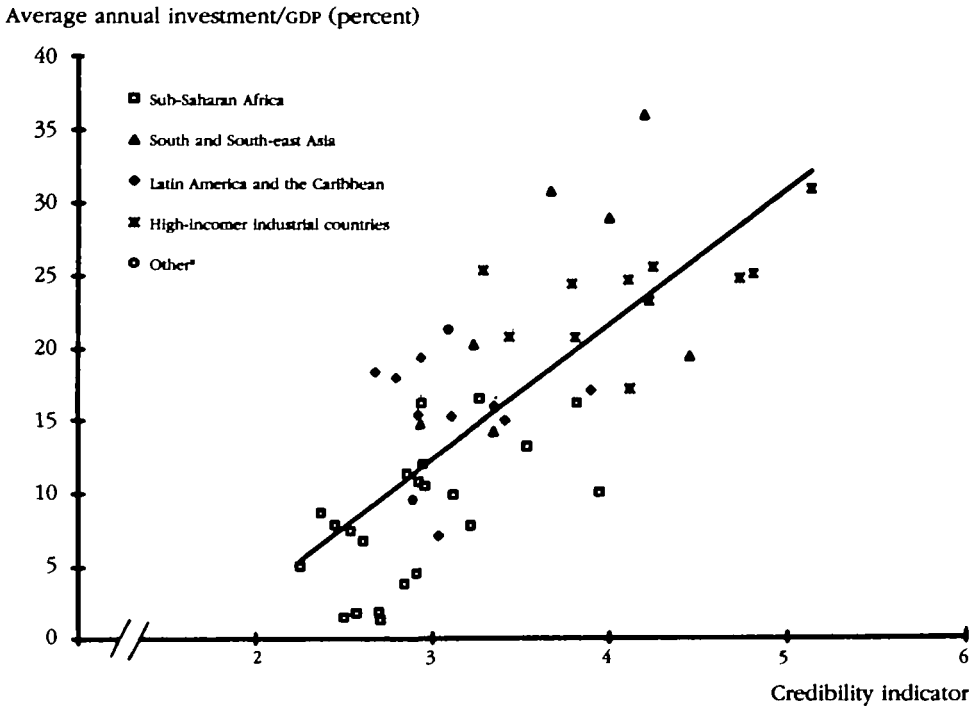
Average annual investment/GDP (percent)

Note: Eact point represents a country. See appendix A for the list of countries by region; all the countries with asterisks are included except Morocco and Turkey.

a. Other includes the Middle East and North Africa and the Commonwealth of Independent States.

Source: Authors' calculations; see appendix D.

period. The opposite pattern applies to the indicator of corruption: it is significantly associated with investment but only weakly with growth. It is interesting to note that Mauro (1995) obtains the same result. He uses business expert data and a different sample of countries but also finds that corruption directly affects investment but not growth. The last row in table 6 shows that the results for the overall credibility indicator are not specific to the 1980s. Credibility is highly significant in both the investment and growth regressions for the longer period.

Comparison with Other Political Variables

Our next step is to compare the credibility indicator with other political variables that are frequently used in cross-country growth analysis. Table 7 shows the results for the base growth regressions for 1980–92. Each regression includes four right-hand variables: initial level of GDP per capita and secondary school enrollment (coefficients are not shown in the table), credibility, and one other political variable.

Table 7 shows that credibility remains significant in all but one regression. The other political variables are all insignificant. The first political variable is

Table 5. *Impact of the Credibility Indicator on Investment/GDP for 51 Countries, 1980–92*

Variable	1	2	3	4
Constant	−8.10	−4.18	−7.77	−6.34
	(−1.78)	(−0.76)	(−1.50)	(−1.40)
GDP per capita in 1980	−2.5 E-4	−2.7 E-4	−2.4 E-4	−1.5 E-4
	(−0.72)	(−0.76)	(−0.65)	(−0.42)
Secondary school enrollment	16.58***	13.97**	16.58***	16.44***
rate in 1980	(3.30)	(2.59)	(3.04)	(3.36)
Government consumption/GDP		−0.15*		
average in 1980–92		(−1.26)		
Inflation rate average in 1980–92			−0.40	
			(−0.22)	
Trade in 1980–92				0.026*
				(1.89)
Credibility indicator	5.38***	5.40***	5.29***	4.18**
	(3.28)	(3.33)	(2.93)	(2.45)
Number of observations	51	51	49	51
Adjusted R^2	0.65	0.65	0.62	0.67

Note: The dependent variable is the average investment rate in 1980–92. The regressions are estimated using ordinary least squares. See appendix A for the list of countries by region and appendix D for variable descriptions. *t*-statistics are in parentheses.
  * Significant at 10 percent.
  ** Significant at 5 percent.
  *** Significant at 1 percent.
Source: Authors' calculations; see appendix D.

Table 6. *Coefficients for the Credibility Indicator and Its Subcomponents in Growth and Investment Regressions for 51 Countries, 1980–92 and 1970–92*

	Dependent variable			
	Growth in per capita GDP		Investment/GDP	
Indicator	1980–92	1970–92	1980–92	1970–92
Predictability of rule making	0.013	0.017**	2.50	3.73
	(1.32)	(2.17)	(1.03)	(1.54)
Perceived political instability	0.008*	0.01**	2.74**	3.57***
	(1.77)	(2.65)	(2.51)	(3.33)
Security of persons and property rights	0.021***	0.018***	3.06**	3.40**
	(4.18)	(4.13)	(2.17)	(2.39)
Reliability of judiciary enforcement	0.013***	0.09***	2.81***	2.97***
	(3.79)	(3.16)	(3.13)	(3.27)
Corruption	0.004	0.07	2.26**	3.84***
	(0.71)	(1.60)	(1.97)	(3.21)
Credibility indicator	0.023***	0.019***	5.36***	6.16***
	(3.35)	(3.81)	(3.28)	(4.03)

Note: Each coefficient reported in the table is from estimation of a separate equation in which the dependent variable is regressed on the indicator, GDP per capita in 1980, and the secondary school enrollment rate in 1980. The regressions are estimated using ordinary least squares. See appendix A for the list of countries by region. See text section III and appendix C for details on the indicators. *t*-statistics are in parentheses.
  * Significant at 10 percent.
  ** Significant at 5 percent.
  *** Significant at 1 percent.
Source: Authors' calculations; see appendix D.

Table 7. *Impact of the Credibility Indicator and Other Political Indicators on Growth in GDP for 51 Countries, 1980–92*

Variable	1	2	3	4	5
Political rights	−0.002 (−0.85)				
Assassinations		−120.8 (−0.92)			
Coups			0.01 (1.19)		
Wars				−0.003 (−0.45)	
Institutional quality					0.007 (1.4)
Credibility indicator	0.019*** (2.89)	0.021*** (3.12)	0.02*** (2.97)	0.022*** (3.34)	0.01 (1.43)
Number of observations	50	49	49	51	42

Note: The dependent variable is growth in GDP per capita in 1980–92. Each regression includes two additional right-hand variables: GDP per capita in 1980 and the secondary school enrollment rate in 1980. The regressions are estimated using ordinary least squares. See appendix A for the list of countries by region and appendix D for variable descriptions. *t*-statistics are in parentheses.

*** Significant at 1 percent.

Source: Authors' calculations; see appendix D.

the indicator of political rights compiled by Freedom House (on the internet). It is used as a measure of the level of democracy and ranges from a high of 1 to a low of 7. A negative sign on the coefficient therefore means that more democracy is associated with higher growth. From a theoretical point of view, it is not clear whether a more democratic system necessarily leads to more growth than a less democratic system. Empirically, the recent cross-country analysis has found no significant association between the level of democracy in a country and its long-term growth performance (see Brunetti and Weder 1995 for a survey of the literature on democracy and growth). This result is reproduced in our sample; the coefficient of the indicator is not significant at the 10 percent level. When we control for political rights, credibility remains significant and has the expected sign. The simple correlation between credibility and political rights is fairly high (−0.67), which indicates that democracy and credibility often go together. See appendix F for the correlation matrix of all political variables.

The next three variables are objective indicators of political stability taken from Easterly and Levine (1997). We would expect negative signs on all of the coefficients. However, all three variables are not even close to significance. Credibility, by contrast, remains significantly associated with growth. The simple correlation between credibility and these three indicators is very low, ranging from 0.07 to −0.17.

The last political variable is a subjective indicator of institutional quality compiled by International Country Risk Guide (ICRG), a professional risk-rating company (see Knack and Keefer 1995 for details). The indicator we use is an average of corruption, rule of law, and quality of the bureaucracy. The institutional

quality indicator is the one most readily comparable with the credibility indicator. It tries to capture similar problems, albeit by asking country experts rather than the local private sector. The results of this regression are not fully comparable with the results of the other regressions in table 7 because the ICRG indicator was available only for 42 countries in our sample. The regression shows that institutional quality has the expected sign but is not significant. Credibility loses significance in this specification because the two indicators are very highly correlated. The simple correlation is 0.83. This is an interesting result in itself because it provides an indirect check on the validity of the survey method. It shows that local private sectors have on average expressed views similar to those of country experts. The advantage of the surveys are that they provide much more disaggregated information than risk-assessment companies do.

Results for an Extended Sample of Transition Economies

Here we present results for a set of transition economies for which data could be gathered. The figure shown should be regarded as tentative mainly because of data limitations in transition economies. The results are not directly comparable with the previous sections because we have to work with different growth data than for the sample of 51 countries. In addition, given that 10-year averages are not very sensible in the case of transition economies, we look at the average growth rate for 1990–95 (provided by the World Bank). The scatter plot of credibility and growth is shown in figure 4.

The scatter plot indicates that credibility may also contribute to explaining differences in growth performance in the transition economies. However, the results for this sample have to be interpreted with caution mainly because of the short observed time period, as well as intrinsic problems of measuring and explaining growth in countries that went through such a major systemic change. Therefore, we do not perform a more formal econometric analysis.

VI. CONCLUSIONS AND DIRECTIONS FOR FURTHER RESEARCH

This article has analyzed a new data set and some results that indicate a close association between indicators of institutional uncertainty derived from this data set and economic growth. The two premises of the research were that institutional uncertainty should be crucial in explaining cross-country differences in economic performance and that existing measures of this relationship are incomplete or crude. We suggested that indicators of the subjective perceptions of private entrepreneurs could be a promising way of measuring the relevant uncertainties.

Our results seem to support the propositions. We constructed an overall indicator of credibility based on survey data and tested whether it contributes to explaining differences in growth and investment across countries. We found that credibility was significantly associated with cross-country differences in growth and investment in a sample of 51 countries for which comparable data were available. This result was strengthened when we looked at an extended time

Figure 4. *Growth in Per Capita GDP and the Credibility Indicator for 18 Transition Economies, 1990–95*

Average annual growth in per capita GDP (percent)
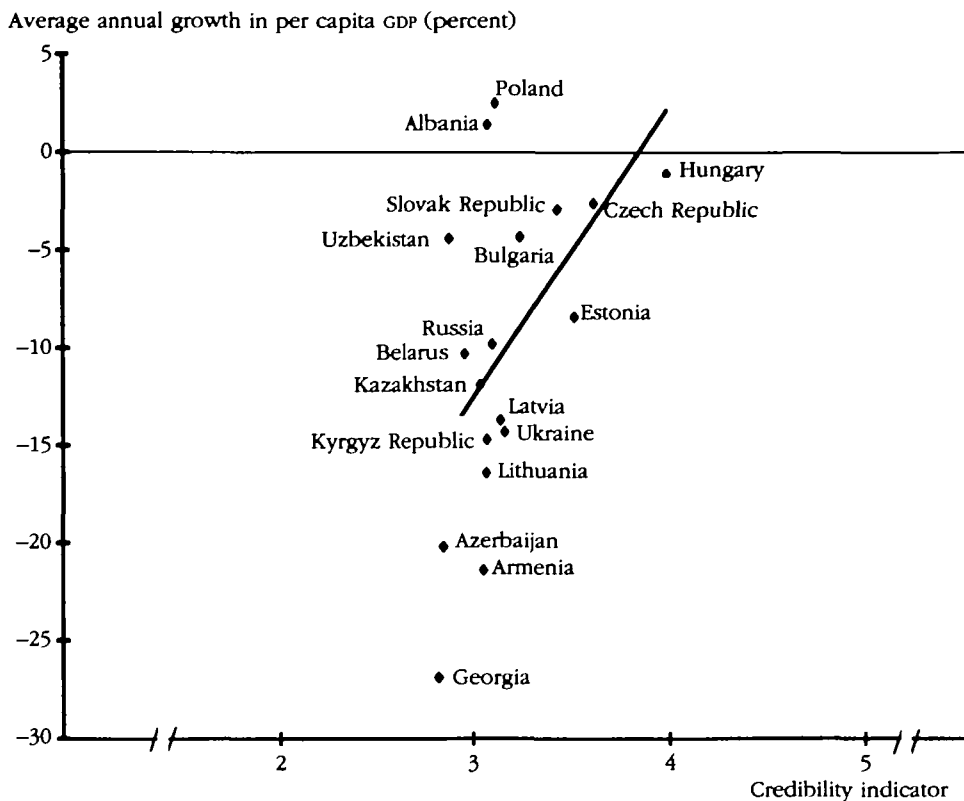
period that might capture the long-term relationship between institutions and growth more adequately.

In addition to testing whether institutions matter for growth, this study was also a first test of the quality of the new data. Although there are many potential problems with subjective indicators derived from surveys that are uniformly conducted in very diverse settings, the close association with economic performance suggests that these indicators are quite reliable. Furthermore, the credibility indicator proves to be highly correlated with indicators of institutional quality provided by risk-assessment companies. This can be interpreted as a further confirmation of the quality of the survey data.

Confidence in the reliability of the survey results opens many avenues for further research that could exploit the micro dimensions of this data set. Possible research questions include whether we can say more about the effects of different uncertainties. For instance, is corruption more harmful than judiciary uncertainty? Are there important regional differences in uncertainties? Are firms of different sizes affected differently by uncertainties? How can we explain differences in institutional variables across countries?

APPENDIX A. COUNTRY LIST

The 51 countries used in the econometric analysis are marked with an asterisk
(*).

Sub-Saharan Africa
Benin*
Cameroon*
Chad*
Congo*
Ghana*
Guinea*
Guinea-Bissau*
Côte d'Ivoire*
Kenya*
Madagascar*
Malawi*
Mali*
Mauritius*
Mozambique*
Nigeria*
Senegal*
South Africa*
Tanzania*
Togo*
Uganda*
Zambia*
Zimbabwe*

South and Southeast Asia
Fiji*
Hong Kong (China)*
India*
Korea, Rep. of*
Malaysia*
Singapore*
Thailand*

Latin America and the Caribbean
Bolivia*
Colombia*
Costa Rica*
Ecuador*
Jamaica*
Mexico*
Paraguay*
Peru*
Venezuela*

High-income industrial countries
Austria*
Canada*
France*
Germany*
Ireland*
Italy*
Portugal*
Spain*
Switzerland*
United Kingdom*
United States*

Middle East and North Africa
Jordan
Morocco*
West Bank and Gaza

Commonwealth of Independent
 States
Armenia
Azerbaijan
Belarus
Georgia
Kazakhstan
Kyrgyz Republic
Moldova
Russia
Ukraine
Uzbekistan

Central and Eastern Europe
Albania
Bulgaria
Czech Republic
Estonia
Hungary
Latvia
Lithuania
Macedonia
Poland
Slovak Republic
Turkey*

APPENDIX B. REGIONAL VARIABILITY OF POLITICAL INDICATORS

Region	Credibility	Predictability	Political stability	Violence	Reliability of judiciary	Lack of corruption
Standard deviation						
All countries	0.63	0.46	0.86	0.65	0.93	0.86
High-income industrial countries	0.57	0.46	0.88	0.48	0.79	0.72
South and Southeast Asia	0.56	0.47	0.76	0.52	0.83	1.03
Middle East and North Africa	0.49	0.23	0.65	0.72	1.02	0.67
Central and Eastern Europe	0.42	0.30	0.70	0.49	0.91	0.61
Latin America and the Caribbean	0.38	0.28	0.41	0.48	0.83	0.40
Sub-Saharan Africa	0.44	0.33	0.60	0.41	0.73	0.73
Commonwealth of Independent States	0.15	0.18	0.33	0.15	0.29	0.37
Coefficient of variation						
All countries	0.20	0.14	0.26	0.23	0.31	0.22
High-income industrial countries	0.14	0.12	0.21	0.13	0.20	0.14
South and Southeast Asia	0.15	0.13	0.21	0.16	0.21	0.25
Middle East and North Africa	0.15	0.07	0.23	0.20	0.39	0.17
Central and Eastern Europe	0.13	0.10	0.20	0.18	0.29	0.16
Latin America and the Caribbean	0.12	0.09	0.11	0.20	0.32	0.11
Sub-Saharan Africa	0.15	0.11	0.23	0.16	0.26	0.20
Commonwealth of Independent States	0.06	0.06	0.11	0.07	0.12	0.12

Note: See appendix A for the list of countries by region. See text section III and appendix C for details on the indicators.
Source: Authors' calculations.

APPENDIX C. QUESTIONS USED TO CONSTRUCT THE CREDIBILITY INDICATOR

Section III in the text explains the components of the credibility indicator. They were calculated by assigning a 1 for the least favorable and a 6 for the most favorable rating for the answer to each question.

1. Do you regularly have to cope with unexpected changes in rules, laws, or policies that materially affect your business? Changes in laws and policies are
    (1)   Completely predictable
    (2)   Highly predictable
    (3)   Fairly predictable
    (4)   Fairly unpredictable
    (5)   Highly unpredictable
    (6)   Completely unpredictable

2. Do you expect the government to stick to announced major policies?
    (1)   Always
    (2)   Mostly
    (3)   Frequently
    (4)   Sometimes
    (5)   Seldom
    (6)   Never

3. "The process of developing new rules or policies is usually such that affected businesses are informed." This is true
    (1)   Always
    (2)   Mostly
    (3)   Frequently
    (4)   Sometimes
    (5)   Seldom
    (6)   Never

4. "In case of important changes in laws or policies affecting my business operation, the government takes into account concerns voiced either by me or by my business association." This is true
    (1)   Always
    (2)   Mostly
    (3)   Frequently
    (4)   Sometimes
    (5)   Seldom
    (6)   Never

5. "*Constitutional changes of government* (as a result of elections) are usually accompanied by large changes in rules and regulations that have an impact on my business." To what degree do you agree with this statement?
    (1)   Fully agree
    (2)   Agree in most cases
    (3)   Tend to agree
    (4)   Tend to disagree
    (5)   Disagree in most cases

(6)   Strongly disagree
___   Does not apply

6. "I constantly fear *unconstitutional government changes* (i.e., coups) that are accompanied by far-reaching policy surprises with significant impact on my business." To what degree do you agree with this statement?
(1)   Fully agree
(2)   Agree in most cases
(3)   Tend to agree
(4)   Tend to disagree
(5)   Disagree in most cases
(6)   Strongly disagree
___   Does not apply

7. "Theft and crime are serious problems that can substantially increase the costs of doing business." To what degree do you agree with this statement?
(1)   Fully agree
(2)   Agree in most cases
(3)   Tend to agree
(4)   Tend to disagree
(5)   Disagree in most cases
(6)   Strongly disagree

8. "I am not confident that the state authorities protect my person and my property from criminal actions." To what degree do you agree with this statement?
(1)   Fully agree
(2)   Agree in most cases
(3)   Tend to agree
(4)   Tend to disagree
(5)   Disagree in most cases
(6)   Strongly disagree

9. "Unpredictability of the judiciary presents a major problem for my business operations." To what degree do you agree with this statement?
(1)   Fully agree
(2)   Agree in most cases
(3)   Tend to agree
(4)   Tend to disagree
(5)   Disagree in most cases
(6)   Strongly disagree

10. "It is common for firms in my line of business to have to pay some irregular 'additional payments' to get things done." This is true
(1)   Always
(2)   Mostly
(3)   Frequently
(4)   Sometimes
(5)   Seldom
(6)   Never

Variable	Description	Period	Source
Growth in GDP per capita	Average annual growth of real GDP per capita	1980–92, 1970–92	Penn World Tables 5.6
GDP	Real GDP per capita in base year	1980, 1970	Penn World Tables 5.6
Secondary school enrollment rate	Secondary school enrollment in base year	1980, 1970	Penn World Tables 5.6
Government consumption	Annual average of government consumption as a percentage of GDP	1980–92, 1970–92	Penn World Tables 5.6
Inflation	Annual average of inflation	1980–92, 1970–92	World Bank data
Trade	Annual average of the sum of exports and imports as a percentage of GDP	1980–92, 1970–92	Penn World Tables 5.6
Investment	Annual average of investment as a percentage of GDP	1980–92, 1970–92	Penn World Tables 5.6
Liquid liabilities	Annual average of the ratio of liquid liabilities over GDP	1980–90	King and Levine (1993)
Political rights	Annual average of indicator for political rights: 1 (high) to 7 (low)	1984–93	Freedom House (various years)
Assassinations	Annual average number of assassinations per million population	1980–89	Easterly and Levine (1997)
Coups	Number of coups	1980–89	Easterly and Levine (1997)
Wars	Dummy for war in period	1980–89	Easterly and Levine (1997)
Institutional quality	Subjective expert opinion on corruption, rule of law, and quality of bureaucracy: 0 (low) to 6 (high)	1980–92	Knack and Keefer (1995)

APPENDIX E. CORRELATION MATRIX FOR SURVEY DATA AND ECONOMIC VARIABLES

Variable or indicator	*Credibility*	*Predictability*	*Political stability*	*Violence*	*Judiciary*
Credibility	1.00				
Predictability	0.83	1.00			
Political stability	0.87	0.69	1.00		
Violence	0.80	0.58	0.62	1.00	
Judiciary	0.90	0.64	0.68	0.74	1.00
Corruption	0.88	0.78	0.69	0.54	0.73
Growth, 1970–92	0.47	0.35	0.41	0.50	0.49
Growth, 1980–92	0.52	0.35	0.43	0.59	0.58
Investment, 1970–92	0.75	0.60	0.70	0.57	0.63
Investment, 1980–92	0.75	0.60	0.69	0.60	0.66
GDP per capita, 1970	0.69	0.69	0.62	0.50	0.49
GDP per capita, 1980	0.76	0.74	0.67	0.57	0.56
School, 1970	0.71	0.69	0.67	0.52	0.52
School, 1980	0.74	0.69	0.69	0.56	0.57
Inflation, 1970–92	–0.23	–0.28	–0.03	–0.25	–0.27
Inflation, 1980–92	–0.26	–0.30	–0.10	–0.27	–0.28
Government, 1970–92	–0.49	–0.52	–0.51	–0.37	–0.33
Government, 1980–92	–0.47	–0.50	–0.50	–0.36	–0.33
Trade, 1970–92	0.33	0.35	0.22	0.17	0.36
Trade, 1980–92	0.35	0.37	0.23	0.19	0.38
Liquid liabilities	0.80	0.69	0.69	0.69	0.69

Note: See appendix D for descriptions of the variables and text section III and appendix C for details on the credibility indicator and its components. Correlations are for 51 countries for all variables with the exception of inflation in 1970–92 and 1980–92 (45 countries) and liquid liabilities (47 countries).

Source: Authors' calculations; see appendix D.

Corruption	Growth		Investment		GDP per capita	
	1970–92	1980–92	1970–92	1980–92	1970	1980
1.00						
0.27	1.00					
0.29	0.89	1.00				
0.68	0.58	0.55	1.00			
0.65	0.64	0.62	0.97	1.00		
0.71	0.10	0.19	0.60	0.59	1.00	
0.75	0.27	0.30	0.68	0.68	0.97	1.00
0.66	0.36	0.44	0.71	0.69	0.84	0.87
0.67	0.42	0.45	0.76	0.77	0.81	0.86
–0.17	–0.21	–0.23	–0.04	–0.09	–0.13	–0.17
–0.21	–0.25	–0.25	–0.10	–0.14	–0.15	–0.19
–0.42	–0.49	–0.39	–0.54	–0.59	–0.49	–0.56
–0.39	–0.49	–0.39	–0.53	–0.58	–0.49	–0.57
0.33	0.60	0.41	0.35	0.35	–0.01	0.13
0.34	0.64	0.45	0.37	0.38	0.00	0.14
0.68	0.45	0.49	0.76	0.77	0.67	0.71

APPENDIX E. (*continued*)

Variable or indicator	School 1970	School 1980	Inflation 1970–92	Inflation 1980–92
Credibility				
Predictability				
Political stability				
Violence				
Judiciary				
Corruption				
Growth, 1970–92				
Growth, 1980–92				
Investment, 1970–92				
Investment, 1980–92				
GDP per capita, 1970				
GDP per capita, 1980				
School, 1970	1.00			
School, 1980	0.91	1.00		
Inflation, 1970–92	–0.10	0.01	1.00	
Inflation, 1980–92	–0.14	–0.06	0.99	1.00
Government, 1970–92	–0.53	–0.64	–0.05	0.02
Government, 1980–92	–0.53	–0.65	–0.07	–0.01
Trade, 1970–92	0.15	0.16	–0.22	–0.22
Trade, 1980–92	0.17	0.18	–0.22	–0.22
Liquid liabilities	0.67	0.62	–0.31	–0.31

Government		Trade		Liquid
1970–92	*1980–92*	*1970–92*	*1980–92*	*liabilities*
1.00				
0.98	1.00			
–0.17	–0.18	1.00		
–0.22	–0.23	1.00	1.00	
–0.44	–0.40	0.35	0.38	1.00

Appendix F. Correlation Matrix for All Political Variables

Variable or indicator	Credibility	Predictability	Political stability	Violence	Judiciary	Corruption	Political rights	Assassinations	Coups	Wars	Institutional quality
Credibility	1.00										
Predictability	0.83	1.00									
Political stability	0.87	0.69	1.00								
Violence	0.80	0.58	0.62	1.00							
Judiciary	0.90	0.64	0.68	0.74	1.00						
Corruption	0.88	0.78	0.69	0.54	0.73	1.00					
Political rights	−0.67	−0.57	−0.77	−0.53	−0.45	−0.54	1.00				
Assassinations	0.07	−0.04	0.17	−0.10	0.02	0.15	−0.16	1.00			
Coups	−0.12	−0.20	−0.18	−0.02	−0.05	−0.07	0.05	0.11	1.00		
Wars	−0.17	−0.19	−0.11	−0.28	−0.09	−0.13	0.19	0.38	0.16	1.00	
Institutional quality	0.83	0.77	0.67	0.66	0.73	0.81	−0.65	−0.14	−0.28	−0.33	1.00

Note: The first six indicators are calculated from the survey results. Correlations for these are for 51 countries. The institutional quality variable is only available for 41 countries, political rights and wars for 50, assassinations for 49, and coups for 48. See appendix D for descriptions of the variables and text section III and appendix C for details on the credibility indicator and its components.

Source: Authors' calculations; see appendix D.

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