

OCCASIONAL  
PAPERS

*Number 53*

PN-ABS-415

ECONOMIC GROWTH,  
POLITICAL AND  
CIVIL LIBERTIES

John C. McMillan, Gordon C. Rausser,  
and Stanley R. Johnson

INTERNATIONAL  
CENTER FOR  
ECONOMIC GROWTH

Since 1985 the International Center for Economic Growth, a nonprofit international policy institute, has contributed to economic growth and human development in developing and post-socialist countries by strengthening the capacity of indigenous research institutes to provide leadership in policy debates. To accomplish this the Center sponsors a wide range of programs—including research, publications, conferences, seminars, and special projects advising governments—through a network of over 300 correspondent institutes worldwide.

The Center is affiliated with the Institute for Contemporary Studies and is headquartered in Panama with the administrative office in San Francisco, California.

For further information, please contact the International Center for Economic Growth, 720 Market Street, Fifth Floor, San Francisco, California 94102, USA. Phone (415) 981-5353; fax (415) 433-6841.

## ICEG Board of Overseers

- |  |   |  |
|--|---|--|
| Y. Seyyid Abdulai<br><i>OPEC Fund for<br/>International<br/>Development, Austria</i>       | Pierre Claver Damiba<br><i>African Capacity<br/>Building Foundation,<br/>Burkina Faso</i> | Tomás Pastoriza<br><i>Banco de Desarrollo<br/>Dominicano, S.A.,<br/>Dominican Republic</i> |
| Abdalatif Al-Hamad<br><i>Arab Fund for Economic<br/>and Social Development,<br/>Kuwait</i> | Antonio Garrigues Walker<br><i>J &amp; A Garrigues, Spain</i>                             | John Petty<br><i>American Czech &amp; Slovak<br/>Enterprise Fund, USA</i>                  |
| Nicolás Ardito-Barletta<br><i>Chairman, ICEG, Panama</i>                                   | Toyoo Gyohten<br><i>The Bank of Tokyo, Ltd.,<br/>Japan</i>                                | William Ryrie<br><i>International Finance<br/>Corporation, USA</i>                         |
| Roy Ash<br><i>Ash Capital Partnership,<br/>USA</i>   | Mahbub ul-Haq<br><i>United Nations<br/>Development Programme,<br/>Pakistan</i>            | Mohammad Sadli<br><i>Indonesian Chamber of<br/>Commerce and Industry,<br/>Indonesia</i>    |
| Bruce Babbitt (on leave)<br><i>USA</i>   | Robert B. Hawkins, Jr.<br><i>Institute for<br/>Contemporary Studies,<br/>USA</i>          | Terry Sanford<br><i>Duke University, USA</i>   |
| Raymond Barre<br><i>France</i>   | Ivan Head<br><i>University of British<br/>Columbia, Canada</i>                            | Stephan Schmidheiny<br><i>Anova A. G., Switzerland</i>                                     |
| William Brock<br><i>The Brock Group, USA</i>   | Robert W. Kasten<br><i>Kasten &amp; Company,<br/>USA</i>                                  | Hari Shankar Singhania<br><i>J. K. Organization, India</i>                                 |
| Roberto Campos<br><i>National Senator, Brazil</i>  | Woo-Choong Kim<br><i>Daewoo Corp., Korea</i>  | Ellen Johnson Sirleaf<br><i>United Nations<br/>Development Programme,<br/>Liberia</i>      |
| Carlos Manuel Castillo<br><i>Costa Rica</i>  | Adalbert Krieger Vasena<br><i>Argentina</i>   | Anthony M. Solomon<br><i>Institute for East-West<br/>Security Studies, USA</i>             |
| A. Lawrence Chickering<br><i>ICTG, USA</i>   | Pedro Pablo Kuczynski<br><i>Peru</i>  | Ernest Stern<br><i>World Bank, USA</i>   |
| B. T. G. Chidzero<br><i>Ministry of Finance,<br/>Zimbabwe</i>                              | Agustín Legorreta<br><i>Inverlat S.A., Mexico</i>   | J. J. Vallarino<br><i>Consejo Interamericano de<br/>Comercio y Producción,<br/>Panama</i>  |
| Gustavo Cisneros<br><i>Organización Cisneros,<br/>Venezuela</i>                            | Sol Linowitz<br><i>Coudert Brothers, USA</i>  | Amnuay Viravan<br><i>Government of Thailand,<br/>Thailand</i>                              |
| Roberto Cívita<br><i>Editora Abril, Brazil</i>   | J. W. Marriott, Jr.<br><i>Marriott Corporation,<br/>USA</i>                               | Paul A. Volcker<br><i>James D. Wolfensohn,<br/>Inc., USA</i>                               |
| A. W. Clausen<br><i>BankAmerica Corp., USA</i>   |   |  |

P2-ABS-415

# **Economic Growth, Political and Civil Liberties**

John C. McMillan, Gordon C. Rausser,  
and Stanley R. Johnson



An International Center for Economic Growth Publication

**ICSPRESS**

San Francisco, California

a'

This Occasional Paper presents research originally issued by the Institute for Policy Reform and distributed under IPR's Working Paper Series, to a readership distinct from the individuals and organizations that receive ICEG publications. Reprinted by permission.

Research fellows and policy practitioners are engaged by IPR to expand the analytical core of the reform process. IPR recognizes cultural, political, economic, and environmental elements as crucial dimensions of the policy reform process. The Working Paper was prepared under a cooperative agreement between the Institute for Policy Reform (IPR) and the U.S. Agency for International Development (AID). Cooperative Agreement No. PDC#0095-A-00-1126-00. Views expressed in the paper are those of the authors and not necessarily those of IPR or AID.

© 1994 Institute for Contemporary Studies

Printed in the United States of America. All rights reserved. No part of this publication may be used or reproduced in any manner without written permission except in the case of brief quotations in critical articles and reviews.

Publication of this Occasional Paper was funded by the United States Agency for International Development (AID).

Publication signifies that the International Center for Economic Growth believes a work to be a competent treatment worthy of public consideration. The findings, interpretations, and conclusions of a work are entirely those of the authors and should not be attributed to ICEG, its affiliated organizations, its Board of Overseers, or organizations that support ICEG.

Inquiries, book orders, and catalog requests should be addressed to ICS Press, 720 Market Street, San Francisco, California 94102, U.S.A. Telephone: (415) 981-5353; fax (415) 986-4878. For book orders and catalog requests, call toll-free in the contiguous United States: (800) 326-0263.

#### Library of Congress Cataloging-in-Publication Data

McMillan, John C.

Economic growth, political and civil liberties / John C. McMillan,  
Gordon C. Rausser, and Stanley R. Johnson.

p. cm. — (Occasional Papers ; no 38)

ISBN 1-55815-355-1

1. Economic development. 2. Developing countries—Social  
conditions. 3. Developing countries—Economic conditions.

I. Rausser, Gordon C. II. Johnson, Stanley R., 1938–

III. Title. IV. Series: Occasional papers (International Center for  
Economic Growth) ; no. 38.

HD75.M355 1994

338.9—dc20

94-6152  
CIP

v.

## PREFACE

We are pleased to publish *Economic Growth, Political and Civil Liberties* by John C. McMillan, Gordon C. Rausser, and Stanley R. Johnson as the fifty-third in our series of Occasional Papers, which present reflections on broad policy issues by noted scholars and policy makers.

In this paper, the authors examine the relationship between institutional reforms, measured by changes in political or civil rights, and economic growth. In investigating the empirical foundation for policy reform prescriptions that arise from the institutional approach to economic growth, they modify previous models, adding a temporal element that allows them to estimate the timing of benefits following a reform.

The authors' analysis supports the idea that reforms protecting political and civil rights can cause increases in economic growth. Five major implications emerge from their investigation: (1) The economic benefits of freedom reforms are systematic and significant. (2) After a lag, economic growth increases following initiation of a reform in political rights or civil liberties. (3) If reforms in civil liberties are to be sustained, they eventually require a reform in political rights. (4) Changes in the capital-labor ratio have a larger effect on economic growth in the short-run than in the long-run, but (5) there is still significant and unexplained regional variation in the short-run effects of changes in this ratio.

The work described in this Occasional Paper was conducted under the auspices of the Institute for Policy Reform, whose objective is to enhance the foundation for broad-based economic growth in developing countries. Through its research, education, and training activities, IPR encourages active participation in the dialogue on policy reform, focusing on changes that stimulate and sustain economic development.

The authors bring to their investigation combined expertise in a wide range of economics and policy disciplines, including agricultural and development economics, econometrics, and institutional analysis. The findings of their study should be of intense interest to all those concerned with encouraging the growth of freedom and democracy, along with economic growth, in developing countries.

Nicolás Ardito-Barletta  
General Director  
International Center for Economic Growth

Panama City, Panama  
April, 1994

A handwritten signature in black ink, located in the bottom right corner of the page. The signature is stylized and appears to be the initials 'J' followed by a flourish.

## ABOUT THE AUTHORS

John C. McMillan is an economist whose work is currently focused on econometrics, economic policy, technological change and economic growth, and institutions and economic growth. Dr. McMillan has been associated with the Institute for Policy Reform and with the University of Chicago, where he received his Ph.D. in 1991.

Gordon C. Rausser is Robert Gordon Sproul Distinguished Professor and chairman of the Department of Agricultural and Resource Economics at the University of California at Berkeley. He is co-founder and current president of the Institute for Policy Reform and principal of the Law and Economics Consulting Group. He has also served as chief economist of the U.S. Agency for International Development, as senior staff economist of the president's Council of Economic Advisers, and in a wide range of other academic and policy positions. Dr. Rausser is the recipient of a number of honors and awards in economics.

Stanley R. Johnson is Charles F. Curtiss Distinguished Professor in the Department of Economics and director of the Center for Agricultural and Rural Development at Iowa State University. He is also executive director of the Food and Agricultural Policy Research Institute and chairman of the Institute for Policy Reform. Dr. Johnson is chairman of the board of the Midwest Agribusiness Trade Research and Information Center and is recognized especially for his work in agricultural and trade policy, both in the United States and abroad.

---

JOHN C. McMILLAN, GORDON C. RAUSSER,  
AND STANLEY R. JOHNSON

---

## **Economic Growth, Political and Civil Liberties**

Although economists have for decades researched and studied the topic, and although donor agencies and foundations have committed hundreds of billions of dollars to technical assistance promoting it, sure-fire recipes for accelerated and sustained national economic growth and development remain substantially a mystery. Recent evidence for the lower income economies that have benefitted from donor support is discouraging (World Bank 1991, U.S. Agency for International Development 1989). During the decade of the 1980's the lower income nations made little progress in improving their economic status. Moreover, there is no widely accepted empirical basis for distinguishing between those nations that did grow and develop and those that did not. In short, despite an abundance of anecdotal evidence and armchair theorizing, the policy disciplines have not solved the puzzle of sustained economic growth.

Available theories on economic growth and development have generated a number of hypotheses on potential determinants. In the contemporary literature, for example, different theories have for periods captured the imagination of the policy disciplines, and of the policy professionals responsible for programming development assistance. Institutions (Commons 1934), technological change (Solow 1957), human capital (Schultz 1964), infrastructure (Mellor 1976), economic policy (Balassa 1971 and Johnson 1973), and increasing external returns to knowledge (Lucas 1988) are examples. More recently, the research on

economic growth and development has focused on institutions and contracts, returning to the themes of Commons and his contemporaries (de Soto 1989, Olson 1982, North 1990, Clague and Rausser 1991, Williamson 1991).

These modern approaches have presented a widened lens linking political rights, civil rights, and economic rights with results on the organization and functioning of competing interest groups and the fuller understanding of the roles of incentives, incentive compatibility, contracts, and credibility (Clague and Rausser 1991). The new democracy initiative of the U.S. Agency for International Development (USAID) and the attention given to processes of policy reform by the donor organizations exemplify the implicit support for the modern institutional approach to programming for economic growth and development.

The empirical results in this paper respond to the challenge of the new institutional approach to economic growth and development policy. The analysis utilizes a set of indices on political and civil rights to measure the impact of reforms on national economic performance for 125 countries during the period, 1972–1988. Exploratory work correlating these liberty indices with variables describing economic performance has already been conducted (Scully 1988, Grier and Tullock 1989, Barro 1991). In contrast to earlier work, our analysis allows an assessment of the causal relationships between political and civil freedoms and the dynamics of economic growth. Moreover, our framework admits a measurement of the size and timing of the benefits realized from reforms of institutional rights.

## **Institutions and Economic Growth**

The modern theory for linking institutions, broadly conceived as both the rules of the game and organizations, to economic growth and development is just emerging (Buchanan 1989, North 1991, Olson 1991, Ruttan 1991, Rausser 1982, 1990). At the heart of the new theory of institutional economics is the idea that the setting in which policies are made or formulated or the “rules by which rules are made,” or the “policy culture,” are a critical determinant of sustained economic growth and development. This theory goes beyond the idea of rent

seeking (Krueger 1974) to identify both productive and predatory roles for interest groups and government (Rausser 1982). In concept, the constitutional setting, the legal and regulatory framework, the authority and history of the bureaucracy (Allison 1971) and the political, civil, and economic rights implied by this complex set of factors govern the possibilities for sustained national economic growth and development.

Research to expand the analytical basis for applying the ideas from this new institutional approach has taken a number of directions. Game theory models have been used to study the strategies of interest groups or agents in competing situations (Rausser and Zusman 1992). Economic functions have been dissected to understand the impacts of ownership and control on the behavior of economic agents, and the principal agent problem. Complexities of the operations of large and multifunction economic units have been evaluated for impacts on behavior (Williamson 1985). And the incentives in differing types of contracts and contracting arrangements have been analyzed (Tirole and Laffont 1990). A major contribution of these results to date has been to seriously question existing theories of economic growth. The more conventional theories have in large measure taken as "given" the very aspects of the national political and economic systems that are the focus of the analysis on institutional-constitutional economics (Buchanan 1989).

Formal economic growth models have been extended to improve explanations of sustained economic growth (Lucas 1988, Romer 1986). Traditional models of economic growth which emphasize capital accumulation predict growth until a zero-growth-rate steady state is reached—a prediction in contrast to the experience of sustained growth in developed economies. Rather than rely on exogenous technological change as an "explanation" of sustained growth, these more recent approaches search for specifications which generate sustained nonzero equilibrium growth rates. A change in institutional technologies can potentially be an important explanation of an economic growth.

### **Empirical Approach**

In many recent empirical growth models,<sup>1</sup> average rates of economic growth conditioned by production function arguments have been related to indices of political and civil rights recorded at particular points in time

(Scully 1988, Barro 1991, Grier and Tullock 1989). These studies have produced promising results, showing an association between higher growth and enhanced political and civil rights. However, these findings are also consistent with an alternative hypothesis: that richer countries can afford more liberal political and civil rights systems. Clearly, differentiation between these two causal hypotheses has far-reaching implications for development assistance and national strategies for economic growth. If the direction of causality is from economic growth to institutions, programs which attempt to produce growth through changed policies and institutions are flawed. However, if economic growth is produced by changes in political, civil, and economic institutions, then initiatives addressing these fundamental features of societal organization can be successful.

Previous empirical work measuring economic growth models has exclusively utilized cross-section data, an approach that has become standard in this area of empirical research. Scully uses ninety-five countries and averages gross domestic product (GDP) growth rates over twenty-five years and Freedom House institutional measures over fifteen years. Barro uses ninety-eight countries and averages country data on growth and on revolutions and assassinations over twenty-six years. DeLong and Summers use twenty-five countries and average their economic data over twenty-six years, and match these averages with policy and institutional measures from the *World Competitiveness Report* in 1983, from the World Bank *World Development Report* in 1983 and 1987, and with information on import barriers measured by Barbine in 1988. Murphy, Shleifer, and Vishny (1991) augment Barro's data set (data averaged over the period 1960–1985) with college enrollment ratios measured in 1970. The empirical results from these and other studies of cross-sectional economic performance are reviewed in Levine and Renelt (1992). While these authors conclude that the most important determinant of economic growth is investment, an alternative methodology provides justification for including measures of institutional rights.<sup>2</sup>

Presumably there are two justifications for the cross-section studies. The first is that economic growth is a long-run phenomenon, best measured through averages over long time periods, and that annual data are contaminated with short-run "noise." A corollary is that there are

no interesting or measurable short-run relationships between institutions, policies, and economic performance. A second justification is that political, institutional, and policy measures have little temporal variation within countries and that measurements across countries capture the main sources of variation.

Unfortunately, the existing cross-sectional approach can be used to measure neither causality nor the timing of responses to reforms in institutions. An alternative to identifying long-run features through averaging the data over long time periods is to utilize time-series econometric methods to decompose annual data into their "permanent" and "transitory" components. This approach has the advantage of utilizing temporal variations in these data to provide evidence on causality and timing issues.

Our alternative approach is to decompose annual observations of per capita GDP growth into two components, permanent and transitory. The two resulting time series are alternatively used as dependent variables in regressions on a set of economic and political variables. The regression utilizing the permanent component as a dependent variable will identify the long-run relationship between growth and economic, political, and reform variables while the regression utilizing the transitory component as a dependent variable will identify the short-run relationship between growth and economic, political, and reform variables. An autoregressive moving average (ARMA) time series model is used to perform the decomposition of GDP growth rates into their permanent and transitory components.

The statistical framework relates the growth rate of aggregate output to the growth rates and levels of physical capital, labor, and shifters of the production function. Our statistical approach is a two-step procedure where the first step is the decomposition of the growth series and the second step is an empirical model which uses the components from the first step as dependent variables and economic and quantified institutional features as explanatory variables.

## **Data**

The data for the empirical analysis are Freedom House indices of political and civil rights (Gastil 1987) and the Penn World Table da-

tabase on national income accounts (Heston and Summers 1992). The sample covers the period from 1972 (the earliest year for which Freedom House indices are available) to 1988 (the last year for which economic data are available in version IV of Heston and Summers Penn World Tables). Annual national capital stocks are estimated from the Penn World Table data.

The dependent variables in empirical estimations are alternatively the permanent and transitory components of annual per capita GDP growth rates. The independent variables are grouped by class. The first class, economic and demographic variables include:

GDP	Per capita gross domestic product, parity purchasing power corrected in 1980 U.S. dollars
GROWKL	The difference in the logarithms of the capital/labor ratio between the current and previous years
POPCHG	The difference in the logarithms of population between the current and previous years
RGDPTT	The level of real gross domestic product (with terms of trade adjustment)

The second group of variables measure levels of the institutional features. These ratings are constructed by the Freedom House through a simple averaging of ratings for different features of a nation's political rights or civil rights (seven features for political rights and thirteen features for civil rights). The political-rights rating measures the degree of representativeness or democratization of a particular government. The civil-rights rating measures whether basic liberties are protected. Each item or point in the list is given a score of 0, 1, or 2 based on a set of procedures that is standard across countries and years. These raw scores are then averaged and represented by a 7-point scale, with 1 being the most free or with the most rights and 7 being the least free or with the most restrictions on rights.

For the political rights most western European democracies are 1's while nations ruled by despots who feel little constraint from public opinion or popular tradition are 7's. Civil rights are 1's for nations in which publication and expression are not closed, especially if the intent is to influence legitimate political processes. The scale level of 7 is for

nations where there is pervasive fear, little independent expression, and a police-state environment.

The qualitative variables measuring institutional features are:

- PIOR2 Takes the value 1, if the political rights have a scale value of 1 or 2; 0 otherwise
- P3TO5 Takes the value 1, if the political rights have a scale value of 3 to 5; 0 otherwise
- CIOR2 Takes the value 1, if the civil rights have a scale value of 1 or 2; 0 otherwise
- C3TO5 Takes a value of 1, if the civil rights have a scale value of 3 to 5; 0 otherwise

Thus, the Freedom House indices were compressed into 3 instead of 7 scale values. Also, to avoid singularity by construction, the qualitative variables representing the scaled values of 6 and 7 were omitted.

Table 1 summarizes annual means and standard deviations of economic and institutional variables for 125 countries. The institutional measures are annual ratings of political and civil rights produced by the Freedom House. These measures are discussed later in greater detail. Table 1 suggests that there is significant temporal variation in these institutional variables within a given country. The empirical approach of this research utilizes these additional sources of variation in identifying relationships between institutional measures of freedoms and economic performance.

The last group of variables are again qualitative and designed to permit estimation of the timing and magnitude of the institutional changes for each of the countries:

- RPD1 Takes the value 1, if the nation has had a political rights scale value less than the historically highest for one year; 0 otherwise
- RPD2–RPD5 Similarly defined variables with the number of years political rights had a scale value less than the historically highest indicated by the identifiers 2 through 5
- RCD1–RCD5 Defined using the same procedures as for political rights, but for civil rights.

TABLE 1 Country Annual Means and Standard Deviations for Selected Variables, 1972-1988

	GDP growth mean	GDP growth std. dev.	KL growth mean	KL growth std. dev.	Pol. rights mean	Pol. rights std. dev.	Civil lib. mean	Civil lib. std. dev.
Afghanistan	-0.0021	0.055	0.0001	0.016	6.8	0.75	6.5	0.62
Algeria	0.0315	0.101	0.0538	0.031	6.0	0.35	6.0	0.00
Angola	-0.0574	0.146	-0.0192	0.019	6.8	0.40	6.6	0.81
Argentina	-0.0086	0.047	0.0063	0.023	3.7	1.99	3.3	1.69
Australia	0.0122	0.024	0.0125	0.005	1.0	0.00	1.0	0.00
Austria	0.0217	0.020	0.0398	0.010	1.0	0.00	1.0	0.00
Bahamas	0.0542	0.072	0.0262	0.023	1.5	0.51	2.1	0.33
Bahrain	0.0433	0.122	0.0081	0.020	5.4	0.61	4.6	0.51
Bangladesh	0.0209	0.028	-0.0101	0.027	4.5	1.46	4.4	0.70
Barbados	0.0142	0.043	0.0243	0.010	1.0	0.00	1.2	0.39
Belgium	0.0135	0.031	0.0239	0.014	1.0	0.00	1.0	0.00
Benin	-0.0110	0.057	0.0148	0.036	7.0	0.00	6.5	0.72
Bolivia	-0.0190	0.049	-0.0012	0.036	4.1	2.03	3.7	0.85
Botswana	0.0410	0.091	0.0797	0.071	2.1	0.24	3.1	0.24
Brazil	0.0178	0.052	0.0327	0.029	3.5	0.94	3.5	1.18
Burkina Faso	0.0216	0.048	0.0158	0.017	5.4	1.80	4.8	1.03
Burma	0.0322	0.020	0.0276	0.024	6.9	0.33	6.2	0.73
Burundi	0.0121	0.057	0.0515	0.038	6.9	0.24	6.2	0.44
Cameroon	0.0208	0.069	0.0362	0.028	6.1	0.24	5.5	1.07
Canada	0.0250	0.034	0.0265	0.008	1.0	0.00	1.0	0.00
Cape Verde	0.0574	0.069	0.0059	0.019	5.7	0.48	6.1	0.57
Cent. Afr. Rep.	-0.0126	0.062	0.0234	0.017	6.9	0.33	6.3	0.69
Chad	-0.0217	0.109	0.0310	0.030	6.6	0.51	6.5	0.51
Chile	-0.0012	0.093	-0.0052	0.022	5.9	1.39	4.8	0.75
China	0.0571	0.046	0.0480	0.027	6.3	0.47	6.2	0.56
Colombia	0.0166	0.024	0.0126	0.007	2.0	0.00	2.8	0.39
Congo	0.0217	0.152	0.0146	0.038	6.5	0.87	6.2	0.39
Costa Rica	0.0091	0.056	0.0235	0.023	1.0	0.00	1.0	0.00
Cyprus	0.0282	0.106	0.0235	0.016	2.1	1.14	2.9	0.93
Denmark	0.0087	0.035	0.0148	0.015	1.0	0.00	1.0	0.00
Dominican Rep.	0.0010	0.043	0.0468	0.027	2.2	1.24	2.6	0.51
Ecuador	0.0170	0.065	0.0261	0.029	3.8	2.30	3.2	1.25
Egypt	0.0427	0.085	0.0481	0.028	5.1	0.66	4.6	0.80
El Salvador	-0.0091	0.072	0.0057	0.027	3.2	1.24	3.7	0.77
Ethiopia	0.0012	0.024	0.0068	0.013	6.5	0.94	6.6	0.61
Fiji	-0.0013	0.061	0.0101	0.019	2.4	1.18	2.3	0.85
Finland	0.0252	0.029	0.0268	0.012	1.9	0.33	1.9	0.33
France	0.0137	0.019	0.0285	0.014	1.0	0.00	1.9	0.33
Gabon	0.0238	0.235	0.0543	0.101	6.0	0.00	6.0	0.00
Gambia	0.0285	0.201	0.1064	0.080	2.5	0.51	2.8	0.95
Ghana	-0.0157	0.067	-0.0377	0.014	5.9	1.68	5.1	1.05
Greece	0.0124	0.029	0.0338	0.028	2.4	1.62	2.4	1.18

*Continued on next page*

Guatemala	-0.0025	0.036	0.0035	0.025	3.8	1.19	4.0	1.32
Guinea	0.0145	0.039	-0.0031	0.006	7.0	0.00	6.4	0.87
Guinea-Bissau	-0.0174	0.096	-0.0293	0.021	6.1	0.34	6.2	0.40
Guyana	-0.0183	0.116	-0.0037	0.024	4.2	0.90	3.9	1.11
Haiti	0.0021	0.047	0.0396	0.026	6.5	0.62	5.7	0.59
Honduras	0.0068	0.058	0.0009	0.023	4.2	1.98	3.0	0.00
Hungary	0.0283	0.036	0.0105	0.008	5.7	0.47	5.2	0.64
Iceland	0.0283	0.049	0.0282	0.011	1.0	0.00	1.0	0.00
India	0.0136	0.038	0.0132	0.004	2.0	0.00	3.1	0.83
Indonesia	0.0479	0.059	0.0785	0.033	5.0	0.00	5.3	0.47
Iran	0.0169	0.150	0.0478	0.038	5.4	0.49	5.8	0.39
Iraq	0.0092	0.242	0.0806	0.073	6.8	0.39	6.9	0.24
Ireland	0.0017	0.027	0.0244	0.015	1.0	0.00	1.2	0.44
Israel	0.0098	0.024	0.0192	0.019	2.0	0.00	2.4	0.49
Italy	0.0279	0.028	0.0268	0.007	1.2	0.44	1.5	0.51
Ivory Coast	-0.0155	0.057	0.0105	0.046	5.9	0.33	5.2	0.44
Jamaica	-0.0201	0.045	0.0193	0.015	1.7	0.47	2.6	0.49
Japan	0.0248	0.029	0.0505	0.023	1.5	0.51	1.0	0.00
Jordan	0.0294	0.090	0.0832	0.058	5.7	0.47	5.6	0.49
Kenya	-0.0056	0.039	0.0112	0.013	5.4	0.49	4.8	0.66
Kuwait	-0.0694	0.140	0.0444	0.049	4.9	1.03	4.0	0.71
Lesotho	0.0615	0.092	0.1147	0.050	5.2	0.53	4.6	0.79
Liberia	-0.0282	0.064	-0.0413	0.019	5.6	0.49	4.8	0.81
Luxembourg	0.0129	0.045	0.0122	0.007	1.3	0.47	1.0	0.00
Madagascar	-0.0343	0.041	-0.0288	0.015	5.2	0.44	5.2	0.88
Malawi	-0.0059	0.038	0.0163	0.038	6.4	0.49	6.6	0.51
Malaysia	0.0335	0.079	0.0606	0.028	2.9	0.43	4.2	0.73
Mali	0.0086	0.037	0.0079	0.011	6.9	0.24	6.2	0.44
Malta	0.0528	0.036	0.0379	0.025	1.6	0.51	2.5	1.12
Mauritania	0.0025	0.097	0.0481	0.066	6.4	0.61	6.0	0.00
Mauritius	0.0475	0.084	0.0236	0.027	2.2	0.39	2.4	0.80
Mexico	0.0067	0.054	0.0201	0.024	3.7	0.59	3.7	0.47
Morocco	0.0246	0.040	0.0399	0.027	4.2	0.64	4.6	0.61
Mozambique	-0.0516	0.085	0.0273	0.021	6.5	0.52	6.8	0.45
Nepal	0.0176	0.039	0.0484	0.020	4.4	1.50	4.4	0.51
Netherlands	0.0101	0.019	0.0119	0.010	1.0	0.00	1.0	0.00
New Zealand	0.0001	0.040	0.0185	0.013	1.0	0.00	1.0	0.00
Nicaragua	-0.0460	0.181	0.0021	0.037	5.1	0.43	4.6	0.61
Niger	-0.0029	0.079	0.0053	0.029	6.8	0.39	6.0	0.00
Nigeria	-0.0164	0.079	0.0302	0.071	5.1	1.90	4.1	0.86
North Yemen	0.0470	0.056	0.0854	0.077	5.4	0.62	4.8	0.44
Norway	0.0238	0.034	0.0276	0.009	1.0	0.00	1.0	0.00
Pakistan	0.0244	0.031	0.0143	0.009	4.9	1.58	4.9	0.60
Panama	0.0107	0.040	0.0212	0.026	5.7	1.10	4.6	1.17
Paraguay	0.0250	0.089	0.0597	0.035	5.0	0.35	5.4	0.49
Peru	-0.0083	0.068	0.0121	0.024	3.9	2.12	3.7	0.92
Philippines	0.0117	0.051	0.0216	0.029	4.4	1.00	4.3	1.21
Poland	-0.0073	0.076	0.0152	0.005	5.8	0.39	5.2	0.64
Portugal	0.0191	0.055	0.0395	0.027	2.3	1.61	2.6	1.33
Rwanda	0.0099	0.048	0.0447	0.018	6.4	0.49	5.7	0.47
Saudi Arabia	0.0087	0.151	0.1818	0.094	6.0	0.00	6.4	0.51

Continued on next page

TABLE 1 (Continued)

	GDP growth mean	GDP growth std. dev.	KL growth mean	KL growth std. dev.	Pol. rights mean	Pol. rights std. dev.	Civil lib. mean	Civil lib. std. dev.
Senegal	0.0014	0.041	-0.0131	0.007	4.3	1.26	4.1	0.86
Sierra Leone	-0.0296	0.062	-0.0103	0.012	5.2	0.64	5.0	0.00
Singapore	0.0490	0.040	0.0955	0.021	4.5	0.51	5.0	0.00
Somalia	0.0042	0.162	0.0481	0.040	7.0	0.00	6.8	0.44
South Africa	0.0018	0.070	0.0073	0.018	4.8	0.40	5.8	0.45
South Korea	0.0583	0.055	0.0764	0.026	4.5	0.80	5.2	0.83
Spain	0.0109	0.029	0.0255	0.019	2.5	1.74	3.1	1.48
Sri Lanka	0.0264	0.051	0.0337	0.014	2.4	0.51	3.4	0.62
Sudan	0.0074	0.075	-0.0012	0.029	5.4	0.79	5.5	0.51
Suriname	0.0040	0.097	0.0167	0.037	4.2	2.26	3.8	1.88
Swaziland	-0.0135	0.103	0.0322	0.038	5.3	0.59	4.9	1.11
Sweden	0.0148	0.024	0.0169	0.010	1.1	0.24	1.0	0.00
Switzerland	0.0150	0.035	0.0264	0.010	1.0	0.00	1.0	0.00
Syria	0.0291	0.119	0.0477	0.037	5.8	0.64	6.6	0.49
Taiwan	0.0550	0.038	0.0798	0.034	5.7	0.44	4.8	0.66
Tanzania	0.0030	0.053	0.0019	0.018	6.0	0.00	6.0	0.00
Thailand	0.0362	0.040	0.0414	0.013	4.1	1.56	3.8	0.88
Togo	-0.0053	0.080	0.0280	0.048	6.6	0.49	5.9	0.33
Trin. & Tob.	-0.0121	0.149	0.0209	0.030	1.6	0.51	1.9	0.43
Tunisia	0.0203	0.037	0.0151	0.017	5.6	0.49	5.0	0.35
Turkey	0.0198	0.043	0.0405	0.023	2.8	1.03	4.0	0.87
Uganda	0.0493	0.189	0.0175	0.026	5.8	1.15	5.6	1.27
United Kingdom	0.0200	0.029	0.0258	0.010	1.0	0.00	1.0	0.00
United States	0.0158	0.032	0.0171	0.009	1.0	0.00	1.0	0.00
United Arab E.	-0.0252	0.109	-0.0185	0.096	5.3	0.59	5.0	0.00
Uruguay	0.0360	0.065	0.0115	0.025	4.2	1.64	4.2	1.59
Venezuela	0.0092	0.097	0.0271	0.043	1.2	0.44	2.0	0.00
West Germany	0.0185	0.027	0.0233	0.007	1.0	0.00	1.6	0.49
Yugoslavia	0.0243	0.046	0.0274	0.009	5.9	0.24	5.3	0.47
Zaire	-0.0443	0.060	0.0258	0.028	6.6	0.51	6.4	0.49
Zambia	-0.0514	0.079	-0.0501	0.027	5.1	0.24	5.0	0.35
Zimbabwe	-0.0007	0.078	-0.0158	0.020	4.8	1.13	5.2	0.53
Sample Averages	0.0102	0.068	0.0223	0.027	4.2	0.64	4.1	0.56

These qualitative variables are illustrated for the example of Bangladesh in Table 2. In 1972, Bangladesh had a political-rights rating of 4. This rating rose to 5 in 1975 and fell to 4 in 1976. The year 1976 is then defined as the beginning of a reform, and the qualitative variable RPD1 takes a value of 1 for this year. In 1977, this reform is sustained, so the variable RPD2 takes a value of 1 for this year. Similarly, RPD3,

TABLE 2 Time Series Models of Per Capita GDP Growth Rates

Model	AIC	Chi-sq lags 1-6	Chi-sq lags 7-12	AR(1)	AR(2)	MA(1)	MA(2)
Raw Data		0.000	0.000				
AR(1)	-4004.78	0.016	0.046	0.188 (7.83)			
AR(1), MA(1)	-4010.14	0.401	0.392	0.542 (5.50)		0.371 (3.41)	
AR(2)	-4008.68	0.203	0.266	0.174 (7.22)	0.065 (2.61)		
AR(2), MA(1)	-4008.17	0.268	0.308	0.602 (2.07)	-0.015 (-0.22)	0.430 (1.49)	
AR(2), MA(2)	-4006.25	0.119	0.238	1.349 (.96)	-0.450 (-0.62)	1.179 (0.84)	-0.315 (-0.65)

RPD4, and RPD5 take values of 1 in 1978, 1979, and 1980. In civil rights, there are two Bangladesh reforms, one initiated in 1977 and one initiated in 1984. Each of these reforms is sustained for five years, with the variables RCD1, RCD2, RCD3, RCD4, and RCD5 taking values of 1 in years following the initiation of a reform in a manner similar to political rights. These qualitative variables allow the estimation of an empirical model which addresses the issue of causality of political- and civil-rights reforms on economic growth, and measures the magnitude and timing of the effects.

Regional variables are defined with the Middle East countries omitted to prevent singularity. The country groups for the geographic effect (with numbers of countries in parenthesis) are:

AMER North and South American continent countries (29)

ASIA Asian countries (18)

AFRI Africa (44)

EURO Europe (23)

There were eleven Middle Eastern countries in the sample.

## Results

Table 3 shows the results of the pooled regressions where the dependent variables are the permanent and transitory decompositions of per capita GDP growth rates. The effect of capital accumulation on GDP growth is larger in the transitory phase than in the long-run, as is seen from the estimates of 0.45 for the variable CKL when the dependent variable is the transitory component, compared with the estimate of 0.16 for the variable CKL when the dependent variable is the permanent component. Neither the level of GDP nor the rate of population growth is significantly related to economic growth. Dummy variables indicate that permanent rates of growth are slightly higher in Asia than in Europe, Africa, and the Americas and larger than the excluded group: the Middle East countries.

Civil rights contribute about a third of a percentage point to the permanent component of annual GDP growth. The dummy variables for civil-rights reforms suggest that reforms in civil rights, after a lag of two years, lead to higher per capita GDP growth rates.

Estimated coefficients from the transitory component regression suggest why the benefits of reforms changing rights might be difficult to implement. Since many of the political reform transitional coefficients (RPD1–RPD5) are negative, and larger in magnitude than the coefficients in the permanent component regression, the benefits to a reform are shown to be slow to accrue.

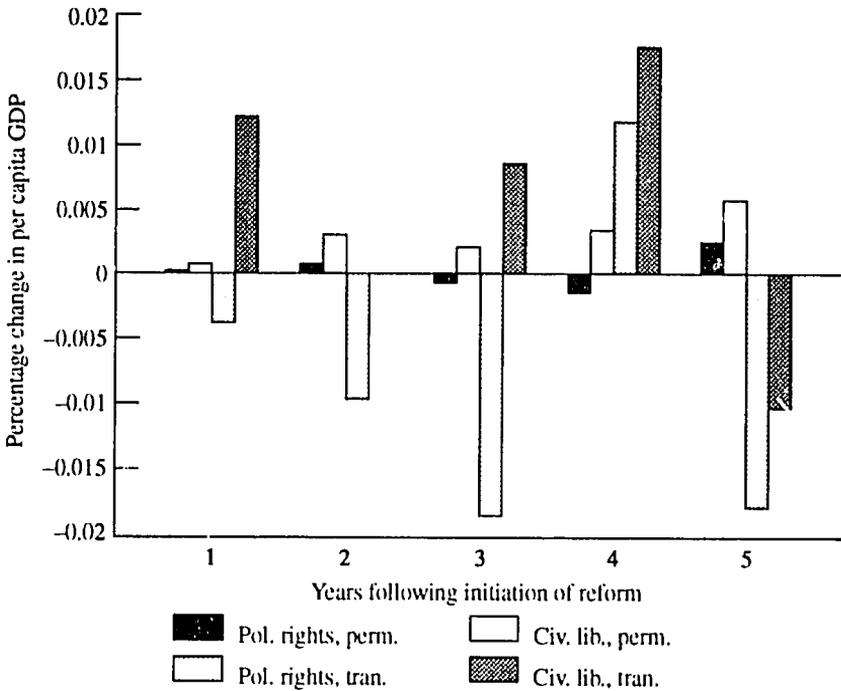
A summary illustration of the differing transitory and permanent effects of reforms is Figure 1, which plots the permanent and transitory effects on economic growth of reforms in civil rights and political rights for each of five years following the initiation of a reform. The net effect in a single year is the sum of the permanent and transitory components. In the case of political rights, this net effect is negative, and large, for the first three years following a reform.

These results suggest that reforms in civil rights have a positive effect on the permanent component of economic growth, while reforms in political rights have a negative effect on the transitory component of economic growth. In order to understand the total effect of reforms on growth, it is necessary to understand the interactions between these two types of reforms in rights. Table 4 breaks down the interrelations be-

TABLE 3 Pooled Growth Regression Results

Dependent variable:	Permanent GDP growth rate		Transitory GDP growth rate (includes institutional levels of freedom variables)		Transitory GDP growth rate	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
INTERCEPT	-0.00736	0.000	-0.01389	0.177	-0.01256	0.211
Economic variables						
CKL	0.15883	0.000	0.44686	0.000	0.44258	0.000
RGDPTT	0.00063	0.573	-0.00000	0.758	0.00000	0.641
POPCHG	0.03081	0.299	-0.19377	0.244	-0.24483	0.122
Geographic regions						
AMER	0.00317	0.041	0.00883	0.310	0.01195	0.152
ASIA	0.00592	0.000	0.02132	0.016	0.02296	0.008
AFRI	0.00408	0.006	0.01441	0.081	0.01550	0.057
EURO	0.00463	0.010	0.01273	0.207	0.01649	0.088
Institutional freedom levels						
PIOR2	-0.00114	0.424	-0.00417	0.604		
P3TO5	-0.00197	0.049	-0.00068	0.904		
CIOR2	0.00381	0.036	0.01453	0.154		
C3TO5	0.00249	0.015	0.00506	0.376		
Institutional freedom reforms						
RPD1	0.00019	0.901	-0.00377	0.651	-0.00371	0.649
RPD2	0.00081	0.580	-0.00894	0.279	-0.00970	0.235
RPD3	-0.00079	0.625	-0.01831	0.042	-0.01851	0.038
RPD4	-0.00141	0.398	0.01202	0.199	0.01181	0.203
PPD5	0.00246	0.154	-0.01800	0.063	-0.01799	0.061
RCD1	0.00074	0.604	0.00913	0.256	0.01212	0.134
RCD2	0.00293	0.050	-0.00549	0.512	-0.00001	0.999
RCD3	0.00202	0.202	0.00719	0.419	0.00838	0.350
RCD4	0.00328	0.068	0.01540	0.126	0.01744	0.085
RCD5	0.00563	0.003	-0.01144	0.284	-0.01030	0.334
Regression statistics						
r-squared	0.238		0.087		0.086	
n	1,775		1,775		1,775	

FIGURE 1 Effects of Reforms on Economic Growth



tween reforms in civil rights and political rights. For the 2,125 country/years in the sample, 1,440 did not experience a reform in basic liberties. Of the 121 reforms initiated in civil rights, 73 were not accompanied by a contemporaneous reform in political rights. Similarly, of the 118 reforms initiated in political rights, 64 were not accompanied by a contemporaneous reform in civil rights.

Table 4 suggests a different relationship between successful reforms in civil rights and successful reforms in political rights. Of 64 reforms initiated in political rights without a reform in civil rights, 49 of the sustained reforms were not accompanied by a reform in civil rights after five years. This contrasts with 32 successfully sustained civil-rights reforms out of 73 initiated without an accompanying reform in political rights. Thus, the typical civil-rights reform required an accompanying reform in political rights in order to be sustained, and these political-rights reforms were likely to produce short-run declines in GDP growth.

TABLE 4 Relationship between Civil Liberties and Political Rights Reforms

Years following reform in civil liberties	Years following reform in political rights						Row total
	0	1	2	3	4	5	
0	1,440	64	63	51	52	49	1,719
1	73	31	6	2	3	6	121
2	60	7	15	5	1	3	91
3	49	8	6	12	4	1	80
4	34	4	4	5	10	3	60
5	32	4	3	3	4	8	54
Column total	1,688	118	97	78	74	70	2,125

A final analysis is to assess the regional differences in responses to reforms. Tables 5 and 6 report regression results for Equation (1) estimated for each geographic region using alternatively the permanent component of GDP growth as the dependant variable (Table 5), and the transitory component of GDP growth as the dependant variable (Table 6). The results of Table 5 suggest that the permanent effect of freer political institutions is negative in Asia and positive in Europe. The results of Table 6 suggest that the largest source of regional variations in growth rates comes through different effects of changes of the capital/labor ratio on economic growth. These rates range from a high of 0.79 for North and South America to a low of 0.26 for European countries and 0.31 for Asian countries. A model was estimated to allow the slope of the change in the capital/labor ratio variable to vary with institutional levels. This specification was not supported by the data.

It may be easier to appreciate the magnitude of these results if they are stated in comparison to changes in the capital/labor ratio. A reform in civil rights which raises a country from the least-free rating to the most-free rating in civil rights is likely to add about 0.4 percentage points to that country's permanent growth rate. Using the growth impact estimate (CKL) of 0.158 obtained from Table 3, a similar rise in the capital/labor ratio of 2.4 percent will produce the same change in growth rates. For the sample mean of a capital/labor ratio of 11,708 in 1980 U.S.

TABLE 5 Pooled Regional Growth Regressions: Dependent Variable Is Permanent Component of Per Capita GDP Growth

	America estimate	<i>P</i> -value	Asia estimate	<i>P</i> -value	Africa estimate	<i>P</i> -value	Europe estimate	<i>P</i> -value	OPEC estimate	<i>P</i> -value
INTERCEP	-0.00729	0.027	0.00394	0.268	0.00474	0.143	-0.00559	0.001	-0.00921	0.194
CKL	0.25961	0.000	0.15134	0.000	0.14759	0.000	0.26255	0.000	0.13265	0.001
RGDPTT	0.00454	0.075	0.00292	0.308	0.00985	0.148	0.00545	0.000	-0.00777	0.133
POPCHG	0.05117	0.542	-0.16185	0.242	-0.27544	0.008	0.42042	0.000	0.04945	0.786
PIOR2	-0.00150	0.557	-0.00428	0.097	-0.00265	0.482	-0.00292	0.242	0.00218	0.924
P3TO5	-0.00501	0.031	-0.00619	0.002	-0.00234	0.249	0.01084	0.000	0.00323	0.599
CIOR2	0.00326	0.389	0.00101	0.785	-0.00674	0.238	0.00085	0.696	0.01479	0.530
C3TO5	0.00463	0.128	0.00498	0.017	0.00286	0.133			0.00622	0.258
RPD1	-0.00283	0.438	0.00101	0.700	-0.00252	0.344	-0.00007	0.975	0.00806	0.389
RPD2	-0.00357	0.260	0.00177	0.502	-0.00080	0.785	-0.00108	0.603	-0.00118	0.895
RPD3	-0.00216	0.571	0.00111	0.678	-0.00064	0.843	0.00024	0.918	-0.01683	0.075
RPD4	-0.00639	0.074	-0.00036	0.893	0.00278	0.408	-0.00249	0.259	-0.00727	0.478
RPD5	-0.00120	0.729	0.00104	0.659	0.00589	0.068	-0.00197	0.372	0.00205	0.833
RCD1	0.00347	0.313	-0.00116	0.622	0.00205	0.506	0.00084	0.737	-0.00212	0.842
RCD2	0.00299	0.476	0.00272	0.255	0.00159	0.657	0.00043	0.824	0.00554	0.594
RCD3	0.00799	0.074	0.00224	0.361	0.00315	0.344	0.00239	0.365	0.00256	0.825
RCD4	0.00647	0.147	0.00152	0.550	0.00172	0.632	-0.00196	0.370	0.01637	0.089
RCD5	0.00306	0.479	0.00168	0.487	0.01023	0.007	0.00162	0.432	0.01038	0.282
<i>r</i> -squared		0.334		0.401		0.235		0.355		0.222
Number of countries		29		18		44		23		11

TABLE 6 Pooled Regional Growth Regressions: Dependent Variable Is Transitory Component of Per Capita GDP Growth

	America estimate	<i>P</i> -value	Asia estimate	<i>P</i> -value	Africa estimate	<i>P</i> -value	Europe estimate	<i>P</i> -value	OPEC estimate	<i>P</i> -value
INTERCEP	-0.01866	0.304	0.05817	0.003	0.03244	0.080	-0.00559	0.001	-0.03069	0.376
CKL	0.79546	0.000	0.30735	0.005	0.36191	0.000	0.26255	0.000	0.50291	0.006
RGDPTT	0.00000	0.883	-0.00000	0.319	0.00000	0.994	0.00000	0.000	-0.00000	0.464
POPCHG	-0.12922	0.781	-2.22802	0.003	-1.37301	0.020	0.42042	0.000	-0.16099	0.857
PIOR2	0.01121	0.426	-0.03394	0.016	-0.01217	0.572	-0.00292	0.242	0.61730	0.877
P3TO5	-0.00208	0.871	-0.02631	0.012	-0.00684	0.556	0.01084	0.000	0.07760	0.011
C1OR2	0.00456	0.828	0.03022	0.135	-0.00496	0.879	0.00085	0.696	0.04278	0.711
3TO5	0.00546	0.745	0.03376	0.003	0.01367	0.208			-0.00548	0.838
RPD1	-0.02896	0.153	-0.00708	0.618	-0.01377	0.366	-0.00007	0.975	-0.05185	0.258
RPD2	-0.01060	0.546	-0.00205	0.886	-0.00431	0.798	-0.00108	0.603	-0.13493	0.003
RPD3	-0.03823	0.071	-0.01117	0.440	0.01125	0.540	0.00024	0.918	-0.06750	0.144
RPD4	-0.01812	0.359	0.00372	0.797	0.03230	0.093	-0.00249	0.259	-0.02055	0.682
RPD5	-0.03142	0.100	0.00890	0.488	-0.01886	0.306	-0.00197	0.372	-0.06400	0.182
RCD1	0.02310	0.225	0.00702	0.583	0.00426	0.810	0.00084	0.737	-0.03925	0.453
RCD2	0.01923	0.407	-0.00249	0.848	0.00543	0.790	0.00043	0.824	-0.03940	0.440
RCD3	0.01827	0.460	-0.00145	0.913	-0.00791	0.677	0.00239	0.365	0.08058	0.157
RCD4	0.01846	0.454	-0.00201	0.884	0.03748	0.069	-0.00196	0.370	0.00964	0.837
RCD5	0.02247	0.347	-0.00952	0.469	-0.03257	0.132	0.00162	0.432	-0.04439	0.347
<i>r</i> -squared		0.142		0.192		0.082		0.123		0.212
Number of countries		29		18		44		23		11

dollars and a population of 33 million, this is equivalent to an annual additional investment of \$9.3 billion in this nation's economy.

## **Conclusions**

These empirical results have five broad implications for policy reform and economic growth:

- The economic benefits of a reform in rights are systematic and significant.
- Economic benefits, in the form of increased growth, occur with a lag after the initiation of reforms in political rights or in civil rights.
- Reforms in civil rights require a reform in political rights in order to be sustained, while the converse is not true.
- Changes in the capital/labor ratio have a larger effect on economic growth in the short-run than in the long-run.
- There remains a significant and unexplained regional variation in the short-run effects of changes in the capital/labor ratio.

The analysis of the cross-country and intertemporal data linking political and civil rights has produced results that support the broad-scale policy interventions often advocated for improving economic growth in developing nations. The model, though largely descriptive, parallels standard aggregate production specifications in neoclassical growth theory. Institutional variables for political freedom and civil rights are introduced to obtain estimates of the effects of both level and changes in institutions. The latter effect provides the principal basis for the conclusion that the institutional, constitutional, and policy changes leading to improved political and civil rights contribute systematically to higher and sustained economic growth. The remaining puzzle, aside from refinements in the estimates related to improved structure and data, is how to make and sustain the institutional, constitutional, and policy changes that result in improved political and civil rights.

**Appendix: Calculation of Economic Variables Used in Regression Analyses**

Variables in [] refer to variable names in the PWT IV data set constructed by Summers and Heston (1988).

GDP figures used are Summers and Heston Real Per Capita GDP current prices [X9], converted to 1980 U.S. dollars by dividing by the U.S. GDP deflator, as reported in the Economic Report of the president.

The growth rate in per capita GDP is the log difference between per capita GDP in adjacent years.

Investment is calculated as Summers and Heston's current prices investment share [X11] multiplied by 1980 current prices per capita GDP [X9] multiplied by population [X1].

An initial capital stock (1960) is estimated as one over the assumed depreciation rate (5%) times investment in 1960. Subsequent capital stocks are calculated as lagged capital stocks multiplied by one minus the depreciation rate, plus current year investment.

Since data used in the regression analysis covers the period 1973–1985, capital stocks in this period are somewhat insensitive to the manner in which beginning capital stocks are approximated.

The capital/labor ratio is the calculated capital stock divided by population [X1]. The growth rate in the capital/labor ratio is the log difference in adjacent years.

## NOTES

1. For the technical details of the model specification and the empirical estimation see McMillan, Rausser, and Johnson 1993.

2. Levine and Renalt examine the fragility of empirical relationships found in cross-country growth regressions. Using an extreme-bounds analysis suggested by Leamer (1983), Levine and Renalt conclude that:

Although there are many econometric specifications in which macroeconomic indicators--taken individually or in groups--are significantly correlated with growth, the cross-country statistical relationship between long-run average growth rates and almost every particular macroeconomic indicator is fragile. National policies appear to be a complex package, and future researchers may wish to focus on macroeconomic policy regimes and interactions among policies as opposed to the independent influence of any particular policy.

Levin and Renalt find one robust correlation, between GDP growth and investment, and suggest that the relationship between institutional freedoms and economic growth is fragile. However, McMillan (1993) finds that the relationship between institutional freedoms and economic growth is robust if an alternative method for dealing with multicollinearity, principal components, is used instead of the extreme-bounds approach.

## BIBLIOGRAPHY

- Allison, Graham. 1971. *Essence of Decision: Explaining the Cuban Missile Crisis*. Boston: Little, Brown.
- Balassa, Bela. 1971. *The Structure of Protection in Developing Countries*. Baltimore: Johns Hopkins Press.
- Barro, Robert. 1991. "Economic Growth in a Cross Section of Countries." *Quarterly Journal of Economics*, Vol. CVI, pp. 407–48.
- Buchanan, James. 1989. *Explorations into Constitutional Economics*. College Station: Texas A&M Press.
- Clague, Christopher, and Gordon Rausser, eds. 1991. *The Emergence of Market Economies in Eastern Europe*. Cambridge, Mass.: Blackwell.
- Commons, John. 1934. *Institutional Economics: Its Place in Political Economy*. New York: Macmillan.
- deSoto, Hernando. 1989. *The Other Path*. New York: Harper and Row.
- Gastil, Raymond. 1987. *Freedom in the World*. Westport, Conn.: Greenwood.
- Grier, Kevin, and Gordon Tullock. 1989. "An Empirical Analysis of Cross-National Economic Growth, 1951–80." *Journal of Monetary Economics*, Vol. 24, pp. 259–76.
- Johnson, D. Gale. 1973. *World Agriculture in Disarray*. London: Fontana, Collins, in association with the Trade Policy Research Center.
- Krueger, Anne. 1974. "The Political Economy of the Rent-seeking Society." *American Economic Review*, Vol. 64, pp. 291–303.
- Levine, Ross, and David Renalt. 1992. "A Sensitivity Analysis of Cross-Country Growth Regressions." *American Economic Review*, Vol. 82, pp. 942–63.

- Lucas, Robert E., Jr. 1988. "On the Mechanics of Economic Development." *Journal of Monetary Economics*, Vol. XXII, pp. 3–42.
- McMillan, John. 1992. "A Principal Components Analysis of Cross-Country Growth Regressions." Working Paper. Institute for Policy Reform, Washington, D.C.
- McMillan, John, Gordon Rausser, and Stanley Johnson. 1993. "Freedoms and Economic Growth: Transitional and Permanent Components." Working Paper. Institute for Policy Reform, Washington, D.C.
- Mellor, John. 1976. *The New Economics of Growth: A Strategy For India and the Developing World*. Ithaca, N.Y.: Cornell University Press.
- Murphy, Kevin, Andrei Shleifer, and Robert Vishny. 1991. "The Allocation of Talent: Implications for Growth." *Quarterly Journal of Economics*, Vol. CVI, pp. 503–30.
- North, Douglass. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge, Mass., and New York: Cambridge University Press.
- Olson, Mancur. 1982. *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*. New Haven, Conn.: Yale University Press.
- Rausser, Gordon C. 1982. "Political Economic Markets: PESTs and PERTs in Food and Agriculture." *American Journal of Agricultural Economics*, Vol. 64, pp. 821–33.
- . 1990. "A New Paradigm for Policy Reform and Economic Development." *American Journal of Agricultural Economics*, Vol. 72, pp. 821–26.
- Rausser, Gordon C., and Pinhas Zusman. 1992. "Public Policy and Constitutional Prescription." *American Journal of Agricultural Economics*, Vol. 74, pp. 247–57.
- Romer, Paul. 1986. "Increasing Returns and Long Run Growth." *Journal of Political Economy*, Vol. XCIV, pp. 1002–37.
- Schultz, T. W. 1964. *Transforming Traditional Agriculture*. New Haven, Conn: Yale University Press.
- Scully, Gerald. 1988. "The Institutional Framework and Economic Development." *Journal of Political Economy*, Vol. 96, pp. 652–62.
- Solow, Robert. 1957. "Technical Change and the Aggregate Production

- Function." *Review of Economics and Statistics*, Vol. XXXIX, pp. 312–20.
- Summers, Robert, and Alan Heston. 1988. "A New Set of International Comparisons of Real Product and Price Levels: Estimates for 130 Countries, 1950–1985." *Review of Income and Wealth*, Series 34, no. 1, pp. 1–25.
- Tirole, Jean, and Laffont, J. J. 1990. "The Politics of Government Decision Making: Regulatory Institutions." *Journal of Law, Economics and Organization*, Vol. 6, pp. 1–32.
- United States Agency for International Development. 1989. *Development and the National Interest: U.S. Economic Assistance into the 21st Century*. Washington, D.C.: Government Printing Office.
- Williamson, Oliver. 1985. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York: Free Press.
- Williamson, Oliver. 1991. "Comparative Economic Organization: The Analysis of Discrete Structural Alternatives." Working Paper. Institute for Policy Reform, Washington, D.C.
- World Bank. 1991. *World Development Report: The Challenge of Development*. New York: Oxford University Press.

## ICEG Academic Advisory Board

- Abel G. Aganbegyan  
*Academy of National Economy,  
Russia*
- Michael J. Boskin  
*Stanford University, USA*
- Hakchung Choo  
*Korea Development Institute, Korea*
- Rudiger Dornbusch  
*Massachusetts Institute of Technology,  
USA*
- Albert Fishlow  
*University of California, Berkeley,  
USA*
- Ernesto Fontaine  
*Pontificia Universidad Católica de  
Chile, Chile*
- Herbert Giersch  
*Kiel Institute of World Economics,  
Germany*
- Francisco Gil Diaz  
*Ministry of Finance, Mexico*
- Malcolm Gillis  
*Kice University, USA*
- Arnold C. Harberger  
*University of California, Los Angeles,  
USA*
- Helen Hughes  
*Australian National University,  
Australia*
- Shinichi Ichimura  
*Osaka International University, Japan*
- Glenn Jenkins  
*Harvard Institute for International  
Development, USA*
- D. Gale Johnson  
*University of Chicago, USA*
- Roberto Junguito  
*Banco Sudameris, Colombia*
- Yutaka Kosai  
*Japan Center for Economic Research,  
Japan*
- Anne O. Krueger  
*Stanford University, USA*
- Deepak Lal  
*University of California, Los Angeles,  
USA*
- Yuan-zheng Luo  
*China*
- Ronald I. McKinnon  
*Stanford University, USA*
- Charles E. McLure, Jr.  
*Hoover Institution, USA*
- Gerald M. Meier  
*Stanford University, USA*
- Seiji Naya  
*University of Hawaii, USA*
- Juan Carlos de Pablo  
*Argentina*
- Afonso Pastore  
*Universidade de São Paulo, Brazil*
- Gustav Ranis  
*Yale University, USA*
- Michael Roemer  
*Harvard Institute for International  
Development, USA*
- Leopoldo Solís  
*Instituto de Investigación Económica  
y Social Lucas Alamán, Mexico*
- Frederick van der Ploeg  
*University of Amsterdam,  
Netherlands*
- David Wall  
*University of Sussex,  
United Kingdom*
- Richard Webb  
*Pontificia Universidad Católica del  
Perú, Perú*
- James Worley  
*Vanderbilt University, USA*