

OCCASIONAL
PAPERS
Number 30

PN ABM-255
79260

**TRANSACTION COSTS,
INSTITUTIONS, AND
ECONOMIC PERFORMANCE**

Douglass C. North

**INTERNATIONAL
CENTER FOR
ECONOMIC GROWTH**

Since 1985 the International Center for Economic Growth, a nonprofit organization, 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 more than 230 correspondent institutes worldwide. The Center's research and publications program is organized around five series: Sector Studies; Country Studies; Studies in Human Development and Social Welfare; Occasional Papers; and Working Papers.

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, 243 Kearny Street, San Francisco, California, 94108, USA. Phone (415) 981-5353; Fax (415) 986-4878.

ICEG Board of Overseers

- | | |
|---|---|
| Y. Seyyid Abdulai
<i>OPEC Fund for International
Development, Austria</i> | Woo-Choong Kim
<i>Daewoo Corp., Korea</i> |
| Abdlatif Al-Hamad
<i>Arab Fund for Economic and Social
Development, Kuwait</i> | Adalbert Krieger Vasena
<i>Argentina</i> |
| Nicolás Ardito-Barletta
<i>Chairman, Panama</i> | Pedro Pablo Kuczynski
<i>Peru</i> |
| Roy Ash
<i>Ash Capital Partnership, USA</i> | Agustín Legorreta
<i>Inverlat S.A., Mexico</i> |
| Bruce Babbitt
<i>Steptoe & Johnson, USA</i> | Sol Linowitz
<i>Coudert Bros., USA</i> |
| Raymond Barre
<i>France</i> | Jorge Mejía Salazar
<i>Colombia</i> |
| Roberto Campos
<i>National Senator, Brazil</i> | Saburo Okita
<i>Institute for Domestic and
International Policy Studies, Japan</i> |
| Carlos Manuel Castillo
<i>Costa Rica</i> | Tomás Pastoriza
<i>Banco de Desarrollo Dominicano,
S.A., Dominican Republic</i> |
| A. Lawrence Chickering
<i>International Center for
Economic Growth, USA
(ex officio)</i> | John Petty
<i>American Czech & Slovak Enterprise
Fund, USA</i> |
| Gustavo Cisneros
<i>Organización Cisneros, Venezuela</i> | Stephan Schmidheiny
<i>Anova A.G., Switzerland</i> |
| Roberto Civita
<i>Editora Abril, Brazil</i> | Hari Shankar Singhania
<i>J.K. Organization, India</i> |
| A. W. Clausen
<i>BankAmerica Corp., USA</i> | Anthony M. Solomon
<i>Institute for East-West Security
Studies, USA</i> |
| Antonio Garrigues Walker
<i>J & H Garrigues, Spain</i> | J. J. Vallarino
<i>Consejo Interamericano de Comercio
y Producción, Panama</i> |
| Robert B. Hawkins, Jr.
<i>Institute for Contemporary Studies,
USA</i> | Amnuay Viravan
<i>Bangkok Bank Ltd., Thailand</i> |
| Ivan Head
<i>University of British Columbia,
Canada</i> | Paul A. Volcker
<i>James D. Wolfensohn, Inc., USA</i> |

Transaction Costs, Institutions, and Economic Performance

Douglass C. North



An International Center for Economic Growth Publication

 PRESS

San Francisco, California

© 1992 International Center for Economic Growth

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

Publication signifies that the Center 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, 243 Kearny Street, San Francisco, California 94108, USA. Telephone: (415) 981-5353; fax: (415) 986-4878; book orders within the contiguous United States: (800) 326-0263.

Library of Congress Cataloging-in-Publication Data

North, Douglass Cecil.

Transaction costs, institutions, and economic performance /
Douglass C. North.

p. cm. — (Occasional papers / International Center for
Economic Growth ; no. 30)

“An International Center for Economic Growth publication.”

ISBN 1-55815-211-3

1. Transaction costs. 2. Institutional economics.

3. Organizational change. 4. Economic development. I. Title.

II. Series: Occasional papers (International Center for Economic
Growth) ; no. 30.

HB8-A6.3.N67 1992

658.4'063—dc20

92-6811

PREFACE

We are pleased to publish *Transaction Costs, Institutions, and Economic Performance*, by Douglass C. North, as the thirtieth in our series of Occasional Papers, which features reflections on broad policy issues by noted scholars and policy makers.

For decades, economists have been conducting research, building models, and prescribing policies based on theories that have ignored an essential part of economic activity and performance: institutions, or the rules of the game in a society. All economies have transaction costs—the myriad costs that go into doing business. How successfully an economy develops depends on how well it can create institutions that minimize those transaction costs. In this paper Professor North develops a framework for analyzing institutional change and applies it to the problems of development, deriving several important implications for policy.

This essay by Professor North, one of the preeminent thinkers in this field, is especially timely. Countries around the world are now attempting to restructure their economic and political institutions to achieve economic prosperity and democracy. Professor North's paper holds important insights for their efforts.

Nicolás Ardito-Barletta
General Director

International Center for Economic Growth

Panama City, Panama
May 1992

ABOUT THE AUTHOR

Douglass C. North has been the Luce Professor of Law and Liberty in the Department of Economics at Washington University in St. Louis since 1983. He served as director of the university's Center in Political Economy from December 1984 through June 1990. In 1985, he was appointed editor of the Cambridge Series of books and monographs on "The Political Economy of Institutions and Decisions." Professor North's appointments at Washington University follow thirty-two years at the University of Washington, where he was director of the Institute for Economic Research for five years and chairman of the Economics Department for twelve years. He was the Peterkin Professor of Political Economics at Rice University in the fall of 1979, Pitt Professor at Cambridge University in England in 1981, and a visiting fellow of the Center for Advanced Studies in the Behavioral Sciences at Stanford University in 1987–1988. He was editor of the *Journal of Economic History* for five years and president of the Economic History Association in 1972. He was a member of the Board of Directors of the National Bureau of Economic Research for twenty years until 1986. In 1987, he was elected to the American Academy of Arts and Sciences. He has lectured at most major American and European universities and many Asian universities and is the author of eight books and more than fifty articles. His most recent research has focused on the formation of political and economic institutions and the consequences of these institutions for economic performance through time. This research was published in his book *Institutions, Institutional Change, and Economic Performance* (Cambridge University Press, 1990).

DOUGLASS C. NORTH

Transaction Costs, Institutions, and Economic Performance

Institutions and the way they evolve shape economic performance. Together with the technology employed, they determine the cost of transacting and producing. Institutions are the rules of the game in a society; more formally, they are the humanly devised constraints that shape human interaction. In consequence they structure incentives in exchange, whether political, social, or economic. Because Western neoclassical economic theory fails to take account of institutions, it is of little help in analyzing the underlying sources of economic performance. It is no exaggeration to say that although neoclassical theory is focused on the operation of efficient markets, few Western economists understand the institutional requirements essential to the creation of such markets; they simply take institutions for granted. In this essay I develop a framework for analyzing institutional change, apply the

This essay is drawn from and builds on my recent book *Institutions, Institutional Change, and Economic Performance* (Cambridge University Press, 1990), an essay entitled "Institutions and Economic Development" prepared as a background paper for the World Bank's *World Development Report 1991*, and an essay entitled "Institutional Innovation for Agricultural Development: Constraints, Problems, and Promise" prepared for the conference "Institutional Innovations for Sustainable Agricultural Development: Into the 21st Century" at the Rockefeller Center at Bellagio, Italy, in October 1991.

framework to the problems of economic development, briefly explore some lessons from history, and conclude with some implications for policy.

The Analytical Framework

Transaction costs. It was Ronald Coase who pointed out that the neoclassical results of efficient markets obtain only in the absence of transaction costs.¹ When transaction costs are significant, then institutions matter. A set of political and economic institutions that provide low-cost transacting makes possible the efficient factor and product markets underlying economic growth.

What determines how costly it is to transact? One can think of transaction costs as all those costs incurred in operating an economic system. Even the most cursory examination of an economy will suggest to the observer that many—indeed most—participants in an economy don't produce anything that individuals consume. But lawyers, bankers, accountants, clerks, foremen, managers, and politicians, to name but a few of the occupations that are largely or wholly engaged in transacting, are essential parts of the operation of an economic system. Indeed, the more complex an economy the more individuals will be engaged in coordinating and operating that system. So it is not surprising that the transaction sector (those transaction costs that go through the market and therefore can be measured in gross national product) of the American economy in 1970 was 45 percent of GNP.²

But there is more to the cost of transacting than simply a large proportion of the labor force engaged in operating an economic system. The way an economic system is organized determines the distribution of the benefits. Therefore it is in the interest of participants to organize the system so that it will benefit them, but in doing so there is no assurance that the resulting institutional structure will result in economic growth. It may result, and typically throughout history has resulted, in economies with high transaction (and production) costs that have prevented economic growth. Economics is about scarcity and hence competition, and while economists correctly laud competition as the force that drives efficient markets, it is also the force that drives

individuals to structure the economy to favor themselves at the expense of others. The fact that information is costly and that individuals possess different amounts of useful information about what is being exchanged is the starting point in understanding how individuals can benefit at the expense of others in exchange.

It is the cost of measuring the valuable attributes of the goods and services or the performance of agents in exchange that is the fundamental key to the cost of transacting. We get utility from the diverse attributes of a good or service or, in the case of the performance of an agent, from the multitude of separate activities that constitute performance. In commonsense terms, this means that when I consume orange juice, I get utility from the quantity of juice, its flavor, and the amount of vitamin C it contains, even though what I purchase is twenty oranges for \$3.00. Similarly, when I buy an automobile, I get a particular color, acceleration, style, interior design, leg room, gasoline mileage—all valuable attributes even though it is only an automobile that I buy. When I buy the services of doctors, their skill, bedside manner, and the amount of time I spend in the waiting room are part of the purchase. When I hire a worker, it is not only the quantity but also the quality of his work that I am paying for. And when I vote for my congresswoman, it is in exchange for the political services she will provide. It takes resources to measure these attributes and additional resources to define and measure the rights transferred. Measurement entails defining not only the physical dimensions of the attributes exchanged (color, size, weight, number, etc.), but also the property rights dimensions of the exchange (rights defining uses, income to be derived, and alienation). Because such costs are high or unforeseeable, the rights are imperfectly and incompletely specified. In consequence, the other variables in the cost of transacting become important.

The second variable in the costliness of the exchange process is the size of the market, which determines whether personal or impersonal exchange occurs. In personal exchange, kinship ties, friendship, personal loyalty, and repeat dealings all play a part in constraining the behavior of participants and reduce the need for costly specification and enforcement. In contrast, in impersonal exchange there is nothing to constrain the parties from taking advantage of each other. Accordingly, the cost of contracting rises with the need for more elaborate

specification of the rights exchanged. Effective competition acts as an essential constraint in efficient impersonal markets.

The third variable is enforcement. In a world of perfect enforcement, there would be a third party impartially (and costlessly) evaluating disputes and awarding compensation to the injured party when contracts are violated. In such a world opportunism, shirking, and cheating would never pay. But such a world does not exist. Indeed, the difficulty of creating a relatively impartial judicial system that enforces agreements has been a critical stumbling block in the path of economic development. In the Western world the evolution of courts, legal systems, and a relatively impartial system of judicial enforcement has played a major role in permitting the development of a complex system of contracting that can extend over time and space, an essential requirement for economic specialization.

Under the neoclassical behavioral assumption of wealth maximization, these three variables alone determine the cost of exchange; that is, individuals would maximize at every margin (if cheating pays, one cheats; if loafing on the job is possible, one loafs; if one could with impunity burn down a competitor, one would do so). But it is hard to imagine that complex exchange and organization would be possible if this assumption accurately described human behavior; the costliness of measuring performance, of fulfilling contracts, and of enforcing agreements would foreclose a world of specialization and division of labor. Ideological attitudes and perceptions, the fourth variable, matter.

Ideology, consisting of the subjective "models" individuals possess to explain and evaluate the world around them, not only plays an essential role in political choices but also is a key to individual choices that affect economic performance. Individual perceptions about the fairness of the rules of the game obviously affect performance; otherwise we would be at a loss to explain a good deal of schooling, as well as the immense investment made by politicians, employers, labor leaders, and others in trying to convince participants of the fairness or unfairness of contractual arrangements. The importance of ideology is a direct function of the degree to which the measurement and enforcement of contracts is costly. If the measurement and enforcement of contract performance can be done at low cost, then it makes very little

difference whether people believe the rules of the game are fair or unfair. But because measurement and enforcement are costly, ideology matters.

Efficient markets are a consequence of institutions that provide low-cost measurement and enforcement of contracts at a particular moment, but I am interested in markets with such characteristics over time. Essential to efficiency over time are institutions that provide economic and political flexibility to adapt to new opportunities. Such adaptively efficient institutions must provide incentives for the acquisition of knowledge and learning, induce innovation, and encourage risk taking and creative activity. In a world of uncertainty, no one knows the correct solution to the problems we confront, as Hayek has persuasively argued. Therefore institutions should encourage trials and eliminate errors. A logical corollary is decentralized decision making that will allow a society to explore many alternative ways to solve problems. It is equally important to learn from and eliminate failures. The institutions therefore must not only provide low-cost measurement of property rights and bankruptcy laws, but also provide incentives to encourage decentralized decision making and effective competitive markets.

Institutions and organizations: definitions and descriptions.

I begin by making a distinction essential to any understanding of institutions and institutional change—that between institutions and organizations.

Institutions consist of formal rules, informal constraints (norms of behavior, conventions, and self-imposed codes of conduct), and the enforcement characteristics of both. In short, they consist of the structure that humans impose on their dealings with each other. The degree to which there is an identity between the objectives of the institutional constraints and the choices individuals make in that institutional setting depends on the effectiveness of enforcement. Enforcement is carried out by the first party (self-imposed codes of conduct), by the second party (retaliation), or by a third party (societal sanctions or coercive enforcement by the state). Institutions, together with the technology employed, affect economic performance by determining transaction and transformation (production) costs.

If institutions are the rules of the game, organizations are the players. Organizations consist of groups of individuals engaged in purposive activity. The constraints imposed by the institutional framework (together with the other standard constraints of economics) define the opportunity set and therefore the kind of organizations that will come into existence. Given the objective function of the organization—maximizing profit, winning elections, regulating businesses, educating students—organizations such as firms, political parties, regulatory agencies, and schools or colleges will engage in acquiring skills and knowledge that will enhance their survival possibilities in the context of ubiquitous competition. The kinds of skills and knowledge that will pay off will be a function of the incentive structure inherent in the institutional matrix. If the highest rates of return in a society are from piracy, then organizations will invest in knowledge and skills that will make them better pirates; if the pay-offs are highest from increasing productivity, then firms and other organizations will invest in skills and knowledge that achieve that objective. Organizations will not only directly invest in acquiring skills and knowledge but will indirectly (through the political process) induce public investment in those kinds of knowledge that they believe will enhance their survival prospects.

Institutional change: agents, sources, process, direction. The agents of change are the political or economic entrepreneurs, the decision makers in organizations. The subjective perceptions (mental models) of entrepreneurs determine the choices they make.

The sources of change are the opportunities perceived by entrepreneurs. They stem either from external changes in the environment or from the acquisition of learning and skills that, given the mental constructs of the actors, suggest new opportunities. Changes in relative prices have been the most common external sources of institutional change in history, but changes in taste have also been important. The acquisition of learning and skills leads entrepreneurs to construct new mental models to decipher the environment, which in turn alter perceived relative prices of potential choices. In fact, it is usually some mixture of external change and internal learning that determines the choices that lead to institutional change.

Deliberate institutional change will therefore come about as a result of the demands of entrepreneurs in the context of the perceived costs of altering the institutional framework at various margins. The entrepreneur will weigh the gains to be derived from recontracting within the existing institutional framework against the gains from devoting resources to altering that framework. Bargaining strength and the incidence of transaction costs are not the same in the polity as in the economy, otherwise it would not be worthwhile for groups to shift the issues to the political arena. Thus entrepreneurs who perceive themselves and their organizations as relative (or absolute) losers in economic exchange as a consequence of the existing structure of relative prices can turn to the political process to right their perceived wrongs by altering that relative price structure. In any case the perceptions of the entrepreneur—correct or incorrect—are the underlying sources of action.

Changes in the formal rules include legislative changes, such as the passage of a new statute; judicial changes that result from court decisions altering the common law; regulatory rule changes enacted by regulatory agencies; and constitutional rule changes, which alter the rules by which other rules are made.

Institutional change resulting from changes in informal constraints—norms, conventions, or personal standards of honesty, for example—will have the same sources, such as learning or relative price changes, but will occur far more gradually and sometimes quite subconsciously as individuals evolve alternative patterns of behavior consistent with their newly perceived evaluation of costs and benefits.

The process of change is overwhelmingly incremental (although I shall deal with revolutionary change later). The reason is that the economies of scope, complementarities, and network externalities that arise from a given institutional matrix of formal rules, informal constraints, and enforcement characteristics will typically bias costs and benefits in favor of choices consistent with the existing framework. All else being equal, the larger the number of rule changes, the greater the number of losers and hence opposition. Therefore, except in the case of gridlock, institutional change will occur at those margins considered most pliable in the context of the bargaining power of interested parties. The incremental change will come from a change in the formal rules

through statute or legal change. Alternatively, changes in informal constraints will involve the gradual withering away of an accepted norm or social convention or the gradual adoption of a new one as the nature of the political, social, or economic exchange slowly changes.

The direction of change is determined by path dependence. The political and economic organizations that have come into existence as a result of the institutional matrix typically have a stake in perpetuating the existing framework. The complementarities, economies of scope, and network externalities mentioned above bias change in favor of the interests of the existing organizations. The interests of these existing organizations, which produce path dependence, and the mental models of the entrepreneurs, which produce ideologies, "rationalize" the existing institutional matrix and therefore bias the actors in favor of policies conceived to be in the interests of existing organizations.

Paths may change course or reverse themselves as a result of external sources of change that weaken the power of existing organizations and strengthen or give rise to organizations with different interests or in response to the unanticipated consequences of the policies of the existing organizations. That is, the mental models of the entrepreneurs that determine the choices they make produce consequences at variance with their desired outcomes; the weakening of the power of existing organizations and the rise of organizations with different interests follow. The critical actors in such situations will be political entrepreneurs, whose freedom will increase in such situations and, given their perception of the issues, give them the ability to induce the growth of and strengthen new and existing organizations and groups with different interests.

Revolutionary change will occur as a result of gridlock arising from a lack of mediating institutions and organizations that enable conflicting parties to reach compromises and bargains that capture some of the gains from potential trades. Such mediating political and economic institutions require not only formal rules and organizations but also informal constraints that can foster dialogue between conflicting parties. The inability to achieve compromise solutions may also reflect the entrepreneurs' limited freedom to bargain and still maintain the loyalty of their constituent groups. Thus the real choice sets of the conflicting parties may have no intersection, so that even though there

are potentially large gains from resolving disagreements, the combination of the limited bargaining freedom of the entrepreneurs and a lack of facilitating institutions makes it impossible to do so.

Revolutionary change, however, is never as revolutionary as its rhetoric would have us believe. It is not just that the power of ideological rhetoric fades as the constituents confront their utopian ideals with the harsh realities of postrevolutionary existence. Rather it is that the formal rules may change overnight but the informal constraints cannot. Inconsistency between the formal rules and the informal constraints (which may be the result of a deep-seated cultural inheritance, because they have traditionally resolved basic exchange problems) results in tensions that are typically resolved by some restructuring of the overall constraints—in both directions—to produce a new equilibrium that is far less revolutionary than the rhetoric.

Institutions and economic theory. Institutions are formed to reduce uncertainty by structuring human interaction, but there is no implication that the results are efficient, as that term is used by economists. At issue are both the meaning of rationality and the characteristics of transacting that prevent the actors from achieving the joint maximization result of the zero-transaction-cost model.

The instrumental rationality postulate of neoclassical theory assumes that the actors possess information necessary to evaluate alternatives correctly and in consequence to make choices that will achieve the desired ends. In fact, such a postulate implicitly assumes the existence of a particular set of institutions and costless information. If institutions play a purely passive role so that they do not constrain the choices of the players and the players are in possession of the information necessary to make correct choices, then the instrumental rationality postulate is the correct building block. If, on the other hand, the players are incompletely informed, devise subjective models as guides to choices, and can only imperfectly correct their models with information feedback, then a procedural rationality postulate is the essential building block for theorizing. Such a postulate not only accounts for the incomplete and imperfect markets that characterize much of the present and the past world, but also leads the researcher to the key to what makes markets imperfect—the cost of transacting.

The cost of transacting arises because information is costly and held asymmetrically by the parties to exchange. As a result, however the players develop institutions to structure human interaction results in some degree of imperfection of the markets. In effect, the incentive consequences of institutions provide mixed signals to the participants, so that even in those cases where the institutional framework is more conducive to capturing the gains from trade than an earlier institutional framework, there will be incentives to cheat, free ride, and so forth that will contribute to market imperfections. The success stories of economic history describe institutional innovations that have lowered the costs of transacting and allowed more of the gains from trade to be captured, thereby permitting the expansion of markets. But such innovations, for the most part, have not created the conditions necessary for the efficient markets of the neoclassical model. The polity specifies and enforces the property rights of the economic marketplace, and the characteristics of the political market are the key to understanding the imperfections of markets.

Just as the efficiency of an economic market can be measured by the degree to which the competitive structure, through arbitrage and efficient information feedback, mimics or approximates the conditions of a zero-transaction-cost framework, so an efficient political market would be one in which constituents accurately evaluate the policies pursued by competing candidates in terms of the net effect on their well-being; in which only legislation (or regulation) that maximized the aggregate income of the affected parties to the exchange would be enacted; and in which compensation to those adversely affected would ensure that no party was injured by the action.

To achieve such results, constituents and legislators would need to possess true models that allowed them to accurately evaluate the gains and losses of alternative policies; legislators would vote their constituents' interests—that is, the vote of each legislator would be weighted by the net gains or losses of the constituents, and losers would be compensated so as to make the exchange worthwhile to them—all at a transaction cost that still resulted in the highest net aggregate gain.

I do not wish to imply that the political process in democracies does not sometimes approach such a nirvana, just as economic markets

sometimes approximate the zero-transaction-cost model implicit in much economic theory. But such instances are exceptional. Voter ignorance, incomplete information, and the resulting prevalence of ideological stereotypes as the underpinnings of the subjective models individuals develop to explain their environment and make choices lead to political markets that can and do perpetuate unproductive institutions and consequent organizations.³

Let me conclude this part of the essay by summing up the key features of this analytical framework of institutional change:

1. The continuous interaction between institutions and organizations in the economic setting of scarcity and hence competition is the key to institutional change.
2. Competition forces organizations to continually invest in skills and knowledge to survive.
3. The institutional framework dictates the kind of skills and knowledge perceived to have the maximum payoff.
4. The mental constructs of the players, given the complexity of the environment, the limited information feedback on the consequences of actions, and the inherited cultural conditioning of the players, determine perceptions.
5. The economies of scope, complementarities, and network externalities of an institutional matrix make institutional change overwhelmingly incremental and path dependent.

The Framework Applied

The institutions I am concerned with in this essay are the rules and informal constraints of the political units that shape economic performance in the economies of the world. The immense diversity in the rules of the game among the high-income polities and economies, the developing countries, and the currently in flux centrally planned

economies results in enormous diversity in the consequent organizations among these economies. A necessary first step in this analysis is to sketch out, however incompletely, the incentive structure—the opportunity set—of these polities and economies in order to understand the kinds of organizations that each gives rise to, since it is the organizations and their entrepreneurs who are the action players in this essay.

But we need still another input in order to meaningfully structure the game to get some useful results. We also must know something about the mental models (theories, ideologies, dogmas, insights) that the players employ to interpret and analyze the issues. The combination of institutional constraints and mental models of the entrepreneurs dictates the direction they will take in acquiring knowledge to deal with the issues.

Finally, we must explore the incentive characteristics of the resulting organizations and particularly the principal-agent problems that will arise.

Let me make clear the direction of the rest of this essay by creating a make-believe model of a largely zero-transaction-cost world (one that is implicitly assumed by many neoclassical economists in their models). In this world the actors possess “true” models about the sources of the constraints on institutions, organizations, technology, environment, and health that threaten sustained development. They can calculate the benefit-cost ratios of alternative policies to overcome these constraints and enact those policies that have the highest payoff (including compensating any losers); where the policies are privately profitable they will be enacted by voluntary organizations and where they are socially but not privately profitable (because of free rider or public goods problems—here the zero-transaction-cost assumption has been lifted) they will be undertaken by public agencies.

The task as I see it is to structure the institutional framework so as to approximate this ideal model.

The institutional constraints. Polities define the formal rules and property rights of economies. A necessary condition for effective solutions to the problems of improved economic performance is the existence of institutional frameworks that provide positive incentives for the creation of many alternative avenues to solve those problems. In other

words, institutions that expand the opportunity set are necessary to induce the creation of the required organizations. The contrast between the performance of the Western economies and the centrally planned economies since World War II provides a sobering reminder of the critical importance of institutional frameworks that induce competition and decentralized decision making and that reward the acquisition of productive skills and knowledge. Whatever the defects of the institutional framework of Western societies for solving the problems we confront (which will be examined below), it cannot be emphasized too strongly that a condition for the creation of appropriate organizations and learning in the developing world and the formerly centrally planned economies is the evolution of institutional frameworks that provide the necessary incentives.

The ideal institutional framework is one that is adaptively efficient, as discussed in the first section. Broadly speaking, democratic polities and decentralized market economies with well-specified and enforced property rights are the closest approximation we know to an adaptively efficient institutional framework. But such a broad generalization conceals wide variations, even among Western economies, in the extent to which the polities and economies deal effectively with the issues of development. The variations stem from the different institutional frameworks and mental models of the actors, which result in variations in organizational structures.

Information processing. The first step in development is to acquire information about the contours of the economy to help identify the costs of transacting and producing and the institutions that underlie those costs. But there is more to information processing than data. There are what I have termed the mental models of the actors; that is, the way the relevant actors—not only policy makers in democratic and nondemocratic polities, but also the public—see the problems.

Economists and other social scientists differ among themselves (that is, they have different mental models to explain, analyze, and evaluate alternatives), but those differences are simplified, magnified, exaggerated, or minimized by the stereotyped ideologies embodied in the varying perceptions of the public, which in turn are reflected in political policies. It is certainly correct that improved information (the

first issue) is an essential step in improving the quality of public perceptions and hence policies, but it would be the height of folly to think that reduced scientific disagreement is all that is necessary to produce “sound” political policies. The ideological stereotypes that dominate political thinking in all the complex issues that concern us do change with changes in scientific knowledge, but the process reflects all the vagaries of political markets discussed above. Political markets simply do not approximate the efficient markets I have described, and because so much of the new political economy is predicated on rational choice models, little of the literature directly confronts the issue of public policy formation under conditions of incomplete information and preconceived, stereotyped, and frequently conflicting theories. Surely we should have learned the importance of ideology during the past seventy years, when communist-inspired mental models shaped the policies of half the world.

The mental models individuals possess are partly culturally derived, partly acquired through experience, and partly learned (non-culturally and nonlocally). Culture consists of the intergenerational transfer of knowledge, values, and other factors that influence behavior and varies radically among ethnic groups and societies. Experience is local—that is, specific to a particular environment—and therefore varies widely with different environments. These first two sources of the mental models of individuals are termed “folk psychology” in the cognitive science literature.⁴ The term refers to our mundane, everyday understanding of ourselves and others. It is nonscientific in origin and results in immense variation in mental models and, in consequence, different perceptions of the world and how it works. The decline in information costs of the past century has, on the other hand, had a homogenizing influence on noncultural learning. While this third source of mental models can result in a reduction of divergent views (although it may, as in the case of the triumph of communist ideology after World War II, result in further divergence), culture and local learning continue to produce immense differences. At the extreme these differences are between, for example, a Shiite fundamentalist in Iran, a Western businesswoman, and a Papuan tribesman. More prosaic but no less important for our purposes are the different mental models mirrored in the conflicting ideological stereotypes that underlie not

only conflicting public policies but also widely varying attitudes toward such values as honesty, integrity, and hard work—values that are critical determinants of the costs of transacting in complex political and economic exchange. I have written at length about this aspect of information processing because, in my view, this is the most difficult and intractable source of the constraints on development.

Organizations. I have described organizations as creations of the opportunity set established by the institutional framework; the direction of their evolution is a function of the incentive structure embodied in that institutional framework. Such a characterization is fine as far as it goes, but it makes two implicit assumptions that are critical to the issues of concern here. The first is that the institutional framework provides clear, unambiguous, and unidirectional signals and incentives to the relevant entrepreneurs. The second is that the relevant entrepreneurs—agents—faithfully carry out the intentions of the principals. Incentive compatibility and principal-agent issues are inextricably interwoven, but before delving into the theoretical issues, let me first outline their relevance to the subject matter of this essay.

Organizations, and specifically their entrepreneurs, are the actors in institutional innovation. If the constraints on development that exist in developing countries are overcome, it will be because the “proper” organizations are put in place and their entrepreneurs carry out the necessary policies.

The initial actors are politicians with constituencies made up of widely varying and frequently conflicting interests to which they are held accountable. How will the politicians protect their interests when they are called on to create the necessary organizations?

The resultant organizations will be staffed by entrepreneurs with their own interests. A consequence of delegating authority to bureaucrats is that they will become more knowledgeable about their policy responsibilities than are the elected officials who created the bureau and as a result will pursue their own agendas (which can range from selling out to an interest group, to shirking, to pursuing their own objectives). How will the politicians and relevant interest groups assure themselves that the entrepreneurs of these bureaucracies will carry out their intentions given the costs involved in monitoring performance?

The answer to the first question is that the politicians will develop an elaborate structure and procedures for the organization that will safeguard compromise solutions between conflicting interests. The answer to the second question is that the structure and procedures will require agencies to follow intricate and cumbersome decision-making processes that will facilitate monitoring by the politicians.⁵ As a consequence, public agencies typically do not have the efficiency characteristics that would exist in a zero-transaction-cost framework. They are hamstrung not only by the constraints imposed to see that divergent interest groups are not “gored” but also by severe restrictions on their freedom to pursue effective policies that might raise the costs of monitoring.

Lessons from History: What Have We Learned?

The foregoing analysis has been essentially a depressing litany of the problems confronting an attempt to overcome the constraints that inhibit development. But clearly there is another story as well. The “Rise of the Western World” is a largely successful story (however admixed with failures) of institutional innovation that has overcome hunger, famine, disease, and poverty to produce the modern Western world. The path-dependent patterns that produced relative success in the Western world and persistent failure in much of the rest of the world give us important clues about not only what works but also what doesn’t work in terms of fundamental institutional frameworks. At the micro level there have recently been important success stories in developing countries, and finally we have begun to realize that simple catchwords like “privatizing” cover up diverse ways by which successful organizations (public as well as private) have evolved to deal with collective action problems. Let me briefly explore some lessons from history.

Path dependence. The contrast between the histories of England and of Spain and their colonies over the past five centuries is a sobering tale of the persistence of a path-dependent pattern of evolution. In the case of England, the Magna Carta, the evolution of secure property rights, and the eventual triumph of Parliament in 1689 were institutional

stepping stones that produced political democracy and long-run economic growth—a pattern reproduced and expanded in English North America. In the case of Spain, a large centralized bureaucracy administered an ever-growing body of decrees and juridical directives that defined the course of action. Every detail of the economy and polity was structured with the objective of furthering the interests of the Crown in the creation of the most powerful empire since Rome. The ultimate consequences were repeated bankruptcies, decline, and centuries of stagnation. In the Spanish New World the pattern of centralized bureaucracies with detailed control of the polity and economy has produced three centuries of sporadic and uneven development and political instability.⁶

But there is more to this lesson of path dependence. The political and economic institutional framework that evolved in the North American colonies and then in the United States led to the evolution of a thriving and productive economy. Take the history of American agriculture, for example. At the time of the Revolutionary War there were approximately 4 million colonists; more than 90 percent farmed and produced enough agricultural output to feed themselves and the other 10 percent and to generate thriving exports. Today farmers are approximately 3 percent of the 253 million population, yet feed themselves and the other 97 percent, and the United States is a leading world exporter of agricultural commodities. The institutional steps along the way in this success story include both a series of Land Ordinances (1784, 1785, and 1787), which efficiently paved the way for redistributing land from public to private hands and secured property rights, providing incentives for rapid settlement and production for markets, and a series of governmental policies that effectively supplemented private incentives to increase agricultural productivity (the creation of the Department of Agriculture in 1862, the Morrill Act of 1862 to establish land-grant colleges to promote the development and dissemination of agricultural knowledge, and the Hatch Act of 1887 to establish agricultural experiment stations in every state in the union). It is not that there have not been many unproductive or even antiproduative agricultural policies enacted in the United States over the past several centuries. It is that the basic underlying institutional framework has rewarded productive activity and mitigated the consequences of poor public policies.

It is too much to claim that the successful institutional framework that evolved in England and was carried over to North America was a deliberate, self-conscious creation. Nonetheless, contrasting the North American with the Spanish and Latin American cases makes clear what works and what doesn't— notions that have been powerfully reinforced by recent events in Central and Eastern Europe. No one knows how to create adaptively efficient institutional frameworks, but we are learning, and ideas matter, particularly in the context of low-cost information about the striking performance differences between the industrial countries and the rest of the world.

The Green Revolution. Let me turn to more recent history. The Green Revolution refers to the dramatic expansion of yields in certain grains during the 1960s and 1970s due to the development of modern varieties (MVs) and high-yield varieties (HYVs). For example, in the Indian Punjab average yields of wheat rose from 1.24 tons per hectare in 1965–1966 to 2.73 tons per hectare in 1980–1981, an increase of 120 percent; yields of rice rose from 1 ton per hectare to 2.74 tons per hectare, a 174 percent increase.⁷ The success of the Green Revolution, however, has not been universal. The rate of adoption has varied widely both among countries (80 percent of the rice area in the Philippines was planted with MVs in the early 1980s, compared with 13 percent in Thailand) and locally (whereas 100 percent of the farmers in one Javanese village planted MVs in 1978, only 14 percent did in another 20 kilometers away).⁸ Government policies have biased technological change in favor of mechanization and away from the adoption of MVs in Argentina and Brazil.⁹ And although the view that HYVs tend to increase income inequality has been discredited,¹⁰ Hayami and Ruttan suggest that where inequality is already extreme the introduction of HYVs may exacerbate this tendency.

The Green Revolution is ongoing but there appear to be some lessons from experience so far. The adoption of HYVs requires the adoption of a package of innovations involving not just seed but fertilizer and water management as well. For instance, several areas in Bangladesh failed to adopt HYVs because of uncertainty over water supplies.¹¹ The importance of the ability of agricultural groups to express their interests to scientists and administrators as well as their

ability to see that these interests are acted upon has been repeatedly stressed in the literature. Hayami and Ruttan suggest that a decentralized system with many small groups of farmers is the most effective.

Governing common pool resources. Hayami and Ruttan's findings are congruent with Elinor Ostrom's empirical study of successes and failures in the governing of common pool resources (CPRs)—“a natural or man-made system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use.”¹² As with public goods, it is difficult to exclude people; but here one individual's consumption diminishes that of others. Ostrom found that there are certain similarities among situations where self-governing common pool resource institutions have developed and been successful. Although they exhibit a wide variety of specific rules, they all have complex and uncertain environments, stable populations, extensive norms governing informal relationships, and relatively homogeneous populations.¹³ In addition, the institutions and organizations that have been successful have similarities that she refers to as designed principles:

1. Boundaries are clearly defined.
2. There is a congruence between appropriation and provision rules and local conditions.
3. Collective choice arrangements exist. Most individuals affected by the operational rules can participate in changing those rules.
4. Monitors actively audit common property resource conditions and appropriator behavior and are accountable to the appropriators or are the appropriators.
5. Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense).
6. Mechanisms for conflict resolution exist.

7. There is minimal recognition of the right to organize (by external government authorities).

And for CPRs that are part of a larger system:

8. Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.¹⁴

Sri Lanka provides interesting examples of how these principles apply. Ostrom examines two systems, Kirindi Oya and Gal Oya, both of which had large-scale irrigation systems but neither of which spontaneously developed institutions to govern the use of the CPR. Both were characterized by relatively unstable, heterogeneous populations. In the case of Kirindi Oya, a project completed under British colonial rule in 1920, a succession of management strategies imposed from above (although with sporadic attempts at greater democratic participation after independence in 1958) and an inept bureaucracy resulted in the dominant noncooperative strategy of cheating by taking more water than one was entitled to. Enforcement was the responsibility of state officials who had little incentive to carry out the task. In fact, politicians used the irrigation system to provide “spoils” for supporters, and large farmers used political contacts to prevent enforcement.¹⁵ The overall result (which has been characteristic of Sri Lankan irrigation projects) has been not only ceaseless conflict but also poor performance, high cost, and a wide discrepancy between project plans and project performance in Sri Lankan farmers’ application of water to their paddy lands (which is a major determinant of rice yields).

The situation was similar on the left bank of the Gal Oya until a project was undertaken to improve the use of the irrigation system. The Agrarian Research and Training Institute (ARTI), assisted by the Rural Development Committee at Cornell University, developed a program in which “institutional organizers” met with farmers and attempted to discern what the farmers perceived to be problems. They then promoted the formation of small groups of ten to fifteen farmers to solve particular problems such as repairing a broken control gate or desilting

a field channel. The members of these field channel organizations were also members of larger distributory channel organizations with 100 to 300 members. In areas where these organizations were developed, farmers almost unanimously agreed that water rotation schemes were being followed and were equitable. Perhaps most notable is the fact that cooperation took place despite traditional conflicts between Tamils and Sinhalese. As of 1986 the project had resulted in an increase of 1,000 acres under cultivation.¹⁶ Ostrom is careful to point out that the relative success of Gal Oya is “fragile” because the population is unstable and heterogeneous.¹⁷ The perverse incentives that had prevailed had produced deep distrust and made it unlikely that the farmers or officials themselves would have overcome the situation. Rather it was the way the ARTI/Cornell team went about involving the participants along the lines of Ostrom’s design principles that appeared to hold out promise of effective institutional innovation.

Institutional Innovation: Promise and Problems

The foregoing brief lessons from history were aimed at showing the different levels at which institutional innovation must occur in order to achieve sustainable development. Before going on let me repeat the essence of my argument. An economy’s political and economic organizations and their entrepreneurs make the decisions that determine economic performance, and they are constrained by the existing institutional framework and the mental constructs that guide the way they process the information they receive.

Reversing institutional paths. We know all too little about altering the direction of economies toward adaptive efficiency, although it is easy enough to state the issues. Both the institutions and the ideological perceptions of the participants must change. Changing institutions entails the alteration of existing organizations or the creation of new organizations whose entrepreneurs will find it worthwhile to undertake productive activities and therefore will directly or indirectly alter the institutional framework to create productive rules and informal constraints.

This process can occur two ways. Learning by the entrepreneurs of existing organizations can lead them to shift from unproductive to productive pursuits as their perception of the most profitable pursuits changes with changing relative prices. Alternatively, poor economic performance in the context of low information costs about contrasting performance elsewhere will undermine the influence and political clout of existing organizations and will sometimes give political entrepreneurs sufficient freedom to initiate productive rule changes (more on this subject below).

Participants change their ideologies or mental models when outcomes are inconsistent with expectations. Such changes, however, in no way guarantee that new ideological constructs will enhance productivity. The widespread conviction after World War II that the future lay with planning and socialism stemmed from the traumatic consequences of the Great Depression and the perceived failure of market economies. And just as that set of perceptions turned out to be illusory, so too can today's faith in the efficacy of markets and private enterprise turn out to be illusory if the "transition" costs involved in the reversal of institutional paths produce a political reaction that negates or thwarts the transition.

Ideology and political markets. Ultimately the formal rules that would embody efficient property rights and enforce them are made by the polity, and as noted earlier, political markets are inherently imperfect and swayed by ideologies and interest group pressures that reflect the organizational interests of existing entrenched groups. The instability of Latin American polities, Robert Bates's studies of agrarian political policies in sub-Saharan Africa,¹⁸ and the rigid orthodoxy and inefficient bureaucracies that have characterized socialist planning in Central and Eastern Europe suggest some of the problems besetting political markets. Not only the formal rules but also the informal constraints embodied in deeply held convictions (that have evolved very slowly) have helped Western polities persist in spite of the tensions resulting from the costs of the second economic revolution.¹⁹

But if political markets are inherently imperfect, that very imperfection has at times made it possible for political entrepreneurs to alter the direction of economies. That is, the imperfection has some-

times given entrepreneurs the freedom to pursue policies and encourage the growth of productive organizations that would not have been possible had they been held responsible to the existing interest groups and ideological perceptions of their constituents. In such contexts ideas matter a great deal, since it is their power that leads political entrepreneurs to gamble on new paths.

A dilemma of institutional change. There exists no theory of the dynamics of polity evolution that can guide the policy maker in the many current restructuring efforts that are ongoing in the developing and formerly socialist economies. But the dilemma is straightforward enough. Slow, incremental change will be sabotaged by the creation of "corruption rights" by the existing bureaucracy. The policy implication is that radical alterations in policy should be accompanied by radical restructuring of the bureaucracy. But this will only be possible where the existing underlying ideology and resultant informal constraints are at least partially complementary to the creation of more efficient property rights. Economies without a heritage of informal institutions and ideological perceptions to enable them to adjust to the stresses and strains of impersonal markets, competition, and other institutional consequences that flow from the technological imperatives of the second economic revolution simply cannot adjust overnight. The institutional infrastructure that must be created entails shifting away from family- and kin-centered social, political, and economic organizations to institutions and organizations that can cushion the insecurities associated with the extreme interdependence of an economy of specialization and impersonal markets. Rapid change will result in social and political turmoil since the informal constraints and underlying ideological perceptions simply will not change all at once. But therein lies the dilemma. Slow change will be sabotaged by existing bureaucracies and interest groups so that the reforms will be distorted, dissipated, and dissolved.

Organizations. "American public bureaucracy is not designed to be effective. The bureaucracy arises out of politics, and its design reflects the interests, strategies, and compromises of those who exercise political power."²⁰ What holds for American public bureaucracy is (with

variations reflecting different political structures) applicable elsewhere. Moreover, designing organizations that are completely incentive compatible—that is, do not provide mixed signals to the players—is probably impossible. “The difficulty is not due to our lack of inventiveness, but to a fundamental conflict among such mechanisms’ attributes as the optimality of equilibria, incentive compatibility of the rules, and the requirements of informational decentralization. Concessions must be made in at least one of these directions.”²¹ Curiously enough, these two quotations that summarize basic dilemmas of public bureaucracy and incentive compatibility in hierarchies are, I believe, grounds for cautious optimism. Just as with institutions, one cannot design effective organizations without an understanding of the nature of the problems involved. And for far too long the literature on organizations has confused pious, normative hopes about what organizations should do with positive models of what organizations in fact do.

Let me take the issue of bureaucratic effectiveness and quote Terry Moe again:

A politically powerful group, acting under uncertainty and concerned with solving a complex policy problem, is normally best off if it resists using its power to tell bureaucrats exactly what to do. It can use its power more productively by selecting the right types of bureaucrats and designing a structure that, although strategically constraining their behavior, still affords them substantial discretion and autonomy. Reputation and predictability make this an especially attractive strategy of group control compared to a strategy of detailed formal command. Through the judicious allocation of bureaucratic roles and responsibilities, incentive systems, and structural checks on bureaucratic choice, a select set of bureaucrats can be unleashed to follow their expert judgements, free from detailed formal instructions.²²

What Terry Moe has attempted to do in this prescription of organizational design of public bureaucracies is to harness the self-interested concerns of politicians and interest groups together with the concern of experts to maintain their reputation in order to provide a safeguard against bureaucratic malfeasance and create a more effective public organization.

Take the issue of incentive incompatibility. If we recognize the impossibility of achieving perfect incentive compatibility in organiza-

tions, then we must recognize that wealth-maximizing incentive structures in organizations must be complemented with appeals to other values in the utility functions of agents. Effective organizations have always supplemented material incentives with appeals designed to convince the agent that the interests of the principal and agent were identical.²³ The success of Japanese firms in instilling standards of loyalty and hard work in their employees reflects a blend of material incentives and widely shared norms of behavior that have shaped the structure of the Japanese firm.

Some general policy implications. Let me conclude this essay by returning to the make-believe model of the largely zero-transaction-cost world described earlier. Transaction costs arise because of the costs of measuring the multiple valuable dimensions involved in exchange (broadly, information costs) and because of the costs of enforcing agreements. Information is not only costly but also incomplete, and enforcement is not only costly but also imperfect. Effective institutions and organizations can reduce the transaction costs per exchange so as to realize more of the potential gains of human interaction. Specifically:

1. We will never have “true” models of the sources of the constraints on technology, environment, and health that threaten sustained development, but the closer we get to a scientific consensus on the major issues, the greater the possibility of successful policies. Fundamental disagreement in the scientific community is going to be magnified and distorted in the ideological stereotypes that characterize political markets. Therefore, a first requirement is the creation and financing of organizations that will not only undertake the research but also effectively disseminate the findings. It is only then that we can get an accurate assessment of the costs and benefits of alternative policies.
2. Enacting the necessary policies is going to entail both restructuring institutions in much of the world and compensating losers. In a zero-transaction-cost world the gainers

would compensate the losers in order to make it jointly worthwhile. In the real world compensation is unusual, and as a result, opposition of the potential losers prevents the enactment of the necessary policies. Reducing the transaction costs in this case means getting better information on the benefit-cost ratios of policies so as to measure the gains and losses and gainers and losers; devising institutional structures that can reduce bargaining costs between gainers and losers; and subsidizing those developing economies that suffer large losses with resources from the industrial economies. With respect to the last point, it is probably politically unrealistic to expect developing and perhaps ex-socialist economies to invest the necessary resources in pollution abatement policies in the face of the short-run costs and forgone opportunities involved.

3. Private voluntary organizations will evolve automatically to take advantage of profitable opportunities where the underlying institutional structure provides the proper incentives; and as the foregoing discussion of common pool resource problems makes clear, voluntary organizations can deal with a wide range of "commons" problems. But for a range of problems where free riding and public goods aspects militate against the spontaneous development of private organizations, it is important that the social benefits (and costs) are clearly known to the polity so that they will be undertaken by governmental organizations. Because of the inherent imperfection of political markets, this last point needs emphasis. If developing country governments do invest in education, for example, they frequently direct that investment into higher education rather than primary education, which has a much higher social rate of return. An "educated" polity would correct such misallocation of resources.

NOTES

1. R. Coase, "The Problem of Social Cost," *The Journal of Law and Economics* (1980) 3:1-44.

2. See J. Wallis and D. North, "Measuring the Transaction Sector in the American Economy, 1870-1970," in S. Engerman and R. Gallman, eds., *Long-Term Factors in American Economic Growth* (Chicago: University of Chicago Press, 1986).

3. See D. North, "A Transaction Cost Theory of Politics," *Journal of Theoretical Politics* (Fall 1990) for an elaboration of this argument.

4. For the problems such mental constructs pose for cognitive science, see A. Clark, "Folk Psychology, Thought and Content," chap. 3, in *Microcognition* (Cambridge: MIT Press, 1990).

5. There is an extensive literature dealing with the politics of bureaucracy (most of it drawn from U.S. experience) using the theoretical building blocks of the new political economy. See in particular T. Moe, "The Politics of Structural Choice: Towards a Theory of Public Bureaucracy," in O. Williamson, ed., *Organization Theory: From Chester Barnard to the Present and Beyond* (Oxford: Oxford University Press, 1990) and the special issue of the *Journal of Law, Economics, and Organization* 6 (1990) entitled "The Organization of Political Institutions."

6. This story is told in more detail in D. North, *Institutions, Institutional Change, and Economic Performance* (Cambridge: Cambridge University Press, 1990), chap. 12.

7. M. Lipton and R. Longhurst, *New Seeds and Poor People* (Baltimore: Johns Hopkins University Press, 1989).

8. Y. Hayami and M. K. Kuchi, *Asian Village Economy at the Crossroads: An Economic Approach to Institutional Change* (Baltimore: Johns Hopkins University Press, 1982), chaps. 8 and 9.

9. J. Sanders and V. Ruttan, "Biased Choice of Technology in Brazilian Agriculture" and A. de Janvry, "Social Structure and Biased Technical Change in Argentine Agriculture," both in H. Binswanger and V. Ruttan, eds., *Induced Innovation* (Baltimore: Johns Hopkins University Press, 1978).

10. Lipton and Longhurst, *New Seeds and Poor People*, 7; Hayami and Ruttan, *Agricultural Development*, 337–40.

11. Lipton and Longhurst, *New Seeds and Poor People*, 63.

12. E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990), 30.

13. *Ibid.*, 88.

14. *Ibid.*, 90.

15. *Ibid.*, 164.

16. *Ibid.*, 167–71.

17. *Ibid.*, 180.

18. See in particular his *Markets and States in Tropical Africa* (Berkeley: University of California Press, 1981).

19. The second economic revolution came about in the second half of the nineteenth century as a consequence of changes in the stock of knowledge arising from the development and implementation of modern scientific disciplines. It resulted in the systematic wedding of science and technology. For economies that could take advantage of this technology, the results were increasing returns and high rates of economic growth. But taking advantage of this technology entailed fundamental reorganization of economies (and societies). Specialization, division of labor, and impersonal exchange on an unprecedented scale have produced stresses and strains that have threatened (and still do threaten) the continued adaptive efficiency of those Western economies that have, at least partially, realized the potential of this technology. It is an extraordinary irony that Karl Marx, who first pointed out the necessity of restructuring societies in order to realize the potential of a new technology, should have been responsible for the creation of economies that have foundered on that precise issue. See D. North, *Structure and Change in Economic History* (New York: Norton, 1981), chap. 12, for an elaboration of the nature and consequences of the second economic revolution.

20. T. Moe, "The Politics of Bureaucratic Structure," in J. E. Chubb and P. E. Peterson, eds., *Can the Government Govern?* (Washington, D.C.: Brookings Institution, 1989), 267.

21. L. Hurwicz, "The Design of Mechanisms for Resource Allocation," *American Economic Review* 63 (1973): 1–30.

22. Moe, "The Politics of Structural Choice," 117.

23. For a sophisticated analysis of the problems and solutions to incentive compatibility in organizations, see Gary Miller, *Managerial Dilemmas: The Political Economy of Hierarchies* (Cambridge: Cambridge University Press, 1991).

ICEG Academic Advisory Board

- Abel G. Aganbegyan
*Academy of Sciences of the USSR,
USSR*
- Michael J. Boskin
Stanford University, USA (on leave)
- Hakchung Choo
Asian Development Bank, Philippines
- Rudiger Dornbusch
*Massachusetts Institute of
Technology, USA*
- Ernesto Fontaine
*Pontificia Universidad Católica de
Chile, Chile*
- Herbert Giersch
*Kiel Institute of World Economics,
Germany*
- Francisco Gil Díaz
Ministry of Finance, Mexico
- Malcolm Gillis
Duke 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 Janguito
Banco Sudameris, Colombia
- Yutaka Kosai
*Japan Center for Economic Research,
Japan*
- Anne O. Krueger
Duke University, USA
- Deepak Lal
*University of California, Los Angeles,
USA*
- 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
DEPABLOCONSULT, Argentina
- Affonso 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*
- David Wall
University of Sussex, United Kingdom
- Richard Webb
*Pontificia Universidad Católica del
Perú, Peru*
- James Worley
Vanderbilt University, USA

Keywords: Exchange costs, transaction costs, general equilibrium, institutions. We thank colleagues at the Universities of Edinburgh, Exeter, KÃ¶ln and St. Andrews, and also at the RES Conference at Warwick University and the ISNIE Conference in Toronto.Â

Transaction costs are the costs of collecting information, bargaining, commu-nicating, decision making, and enforcing contracts between individuals, â€¦rms and the state (Coase, 1960).Â Coase (1992, p.716) argues that â€œa large partâ€ of economic activity is directed at alleviating transaction costs, whilst Wallis and North (1986) estimate that the transaction sector comprised half of US GNP in 1970, a proportion which had grown signiâ€cantly over the preceding century.