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## Regulation and Development

In *Regulation and Development* Jean-Jacques Laffont provides the first theoretical analysis of regulation of public services for developing countries. He shows how the debate between price-cap regulation and cost-of-service regulation is affected by the characteristics of less developed countries (LDCs) and offers a positive theory of privatization that stresses the role of corruption. He develops a new theory of regulation with limited enforcement capabilities and discusses the delicate issue of access pricing in view of LDCs' specificities. In the final chapter he proposes a theory of separation of powers which reveals one of the many vicious circles of underdevelopment made explicit by the economics of information. Based on organization theory and history, and using simple empirical tests wherever possible, Professor Laffont offers a comprehensive evaluation of the different ways to organize the regulatory institutions. An authoritative book from one of Europe's leading economists, it makes a significant contribution to the field.

**Jean-Jacques Laffont** was Professor of Economics at the University of Toulouse and at the University of Southern California. He published extensively in public economics, incentive theory, development economics, and the economics of regulation. He died in 2004.

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### **Federico Caffè Lectures**

This series of annual lectures was initiated to honour the memory of Federico Caffè. They are jointly sponsored by the Department of Public Economics at the University of Rome, where Caffè held a chair from 1959 to 1987, and the Bank of Italy, where he served for many years as an adviser. The publication of the lectures will provide a vehicle for leading scholars in the economics profession, and for the interested general reader, to reflect on the pressing economic and social issues of the times.

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PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE  
 The Pitt Building, Trumpington Street, Cambridge, CB2 1RP, United Kingdom

CAMBRIDGE UNIVERSITY PRESS  
 The Edinburgh Building, Cambridge, CB2 2RU, UK  
 40 West 20th Street, New York, NY 10011-4211, USA  
 477 Williamstown Road, Port Melbourne, VIC 3207, Australia  
 Ruiz de Alarcón 13, 28014 Madrid, Spain  
 Dock House, The Waterfront, Cape Town 8001, South Africa  
<http://www.cambridge.org>

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First published 2005

Printed in the United Kingdom at the University Press, Cambridge

*Typeface* Melior 10/13 pt.    *System* L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> [TB]

*A catalogue record for this book is available from the British Library*

*Library of Congress Cataloguing in Publication data*

Laffont, Jean-Jacques, 1947–2004  
 Regulation and development/Jean-Jacques Laffont.  
     p. cm. – (Federico Caffè lectures)  
 Includes bibliographical references and index.  
 ISBN 0-521-84018-X – ISBN 0-521-54948-5 (pbk.)  
     1. Municipal services–Developing countries.    2. Municipal services–Government policy–Developing countries.    I. Title.  
     II. Series.

HD4431.L34 2004 363.6'01–dc22

2003069754

ISBN 0 521 84018 X hardback  
 ISBN 0 521 54948 5 paperback

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## Publisher's acknowledgment

*Regulation and Development* was being typeset at the time of Jean-Jacques Laffont's tragically early death in May 2004. The Publisher wishes to acknowledge with gratitude the help of Jean-Jacques' friends and colleagues who, working on both sides of the Atlantic, between them read and corrected the page proofs: Bharat Bhole, Isabelle Brocas, Antonio Estache, Hossein Farzin, David Martimort, and Jean Tirole. In their note attached to the corrected proofs they write;

Because life did not leave Jean-Jacques time to read the proofs, several persons were involved in reading and sometimes correcting them, keeping in mind the desire to provide a final version of the book as close as possible to what Jean-Jacques would have liked himself.

We all hope that we have done a good job but are fully conscious that Jean-Jacques would have done much better by himself.



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## Foreword

### François Bourguignon

Jean-Jacques Laffont's book on "regulation and development" is to be praised on two grounds. It is the first comprehensive book to revisit the theory of regulation and incentives from the viewpoint of the needs and constraints of developing and transition countries. Following the liberalization, deregulation, and privatization trends that significantly modified industrial structures in developed countries in the 1980s, and in the wake of the "structural adjustment" and the "transition" from socialism, a powerful set of reforms was set in motion in developing and transition countries during the 1990s. Positive results are starting to show up in transition countries as they overcome the adjustment costs of the transition. But, in both developing and transition countries, satisfaction with the reforms is far from uniform. In several cases, liberalization and privatization have been severely criticized by some for having led to practically unregulated private monopolies that charge unduly high prices and do not necessarily improve quality. Today, it is increasingly recognized that, in many instances, the problem was that reformers disregarded the functioning of regulatory institutions, assuming implicitly they would work as in developed countries.

Chief Economist and Senior Vice President, Development Economics, World Bank.

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Regulatory institutions do not always function well in rich countries; however, the problems confronting developing countries are both more numerous and more serious. Offering a theory of regulatory institutions specific to developing countries is therefore a major contribution to development economics.

Second, this book is authored by one of the best specialists of the theory of regulation and incentive theory in the world, a major contributor to this branch of economics who did much to bring it at the forefront of the discipline, where it belongs. His 1993 book with Jean Tirole on the *Theory of Incentives for Procurement and Regulation* continues to be the undisputed reference for anyone working on the theory of regulation. It was then followed by many more publications and books. All represented a breakthrough not just for economic theorists but also for policymakers as Jean-Jacques increasingly allocated his energy towards addressing policy issues directly.

Among Jean-Jacques's many contributions to the theory of regulation and incentives, early work had already touched upon specific applications to developing countries. His work on the relationship between monopolists and the state as a contract with specific goals and informational constraints was particularly relevant here. In particular, it forced Jean-Jacques to question much of the received wisdom from the traditional public economics literature on the real control that the government can exercise on the behavior of monopolistic providers of public services. The relevance of cost and demand uncertainty for the choice of a regulatory regime also led him to question the standard recommendations by consultants advising reforming governments in developing countries to adopt an incentive-based regulatory regime under all circumstances. The analysis of access pricing and interconnection charges and other entry issues in competition policy also made him question the superiority of the Efficiency Component Pricing Rule

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under a wide set of circumstances relevant to developing countries.

We should also mention several other contributions which were of relevance for developing countries. For instance, Jean-Jacques' application of econometrics to various aspects of industrial organization theory includes new insights into the design of auctions and a critique of many practices in the allocation of the use of natural resources, and in the award of public contracts or of licenses for the delivery of public services. In particular, he actively participated in the debate on the way in which licences in the telecoms sector should be awarded, both in France and in developing countries. He saw cost modeling work in the telecoms sector as an effective instrument to reduce the cost inefficiencies resulting from the information asymmetries critical to a number of important regulatory decisions (including the pricing of the Universal Service Obligations, USOs, and of access to the basic common infrastructures). His analysis of agency problems in multiprincipal-multiple agency contexts was also crucial to the public sector institutions, including regulatory agencies.

Over time, his trips around the world from Argentina to China, to many sub-Saharan African countries and to Eastern European countries, eventually led Jean-Jacques to develop a research agenda that focused on developing countries. Five of his previous books dealt fully or partially with developing country issues. Three of the books he co-authored in the 1990s were actually published in China, where his theoretical contribution was widely known and where he was a frequent lecturer at the University of Wuhan and at a research center he helped establish at the Chinese Academy of Social Sciences in Beijing.

The present book very much reflects Jean-Jacques' research agenda on development and may be seen as a first attempt at synthesizing what he had learned in a number of key areas. For instance, he held rather strong – and most welcome – views on the costs and benefits of privatization of network

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industries and he was concerned about the pragmatism and the cost effectiveness of the way in which social issues were addressed in the design of regulatory regimes in developing countries. This included research on the financing of USOs and on the case for cross-subsidies when tax systems are unable to generate the appropriate levels of resources to finance social programs. His work also included reflections on corruption and capture by private operators and their interference with reform processes and the way governments are meeting their obligations to the poorest. The agenda also covered the need to reconsider the role of the state in the context of reform and to assess the limits of standard reforms when civil servants are not benevolent and use their power to meet their own objectives, political or otherwise.

Doubtless, there was more to come. Much more. In the discussions I regularly had with Jean-Jacques over the last couple of years, he was always telling me how, at the stage he had reached in his career, he saw economic development as the single most important global issue and how he intended to devote most of his future work to this area of economics. We both shared the same passion for development, and we were both convinced that rigorous economic analysis was key to accelerate it. We differed only in the field that should be given priority. On this point, I remember that Jean-Jacques constantly argued that the regulation of the price of public services and utilities was central for the reduction of poverty and that people like us in the World Bank, specializing in poverty and inequity, should pay much more attention to these issues. I am happy that his concern is very much taken care of in the research work pursued today in the World Bank. I would be still happier if we could have enjoyed his continued collaboration. Alas, this will not happen. It is a tragedy that such a prolific research career, such a talent, such a commitment for effective development policy, had to come so dramatically to an end. We are missing not only a dear friend but a deep and active thinker on key aspects of development.

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We are fortunate that Jean-Jacques had the time to finish this book, a major work that will doubtlessly inspire and influence development thinking in the future and certainly the most obvious testimony of his profound commitment and contribution to the cause of development.

### Y. Hossein Farzin

Perhaps the most satisfying thing for an economist is to see his or her research making an impact on economic policy-making and, ultimately, on the well-being of people. This is even more true if the economist happens to be a theorist and the people are very poor and living in developing countries. Jean-Jacques Laffont's vision was to improve life for poor people in developing countries, and this motivation was evident during informal discussions at conferences and on other occasions. The desire to improve the lives of poor people in developing countries was the major motive for writing this book, since Jean-Jacques believed that the well-being of people in poor countries depended largely on basic infrastructure such as a reliable water supply, electricity, transportation, telecommunications, postal service, and health and education services. Governments traditionally provide or regulate these services, and Jean-Jacques argued that one important way to improve the living standards of poor people was to create and enhance the capabilities of governments to improve and expand the delivery of basic services.

Through personal experience, Jean-Jacques became aware of the inadequacies and imperfections of public institutions to manage basic services efficiently and equitably. As he notes throughout this book, public institutions can be plagued with corruption, lawlessness, unaccountability, imperfect information, inadequacy of physical and financial infrastructure,

University of California at Davis; Associate Editor, *Review of Development Economics*.

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and shortage of human and financial resources to design and implement the necessary regulations, and high costs to raise funds to provide basic public services.

Jean-Jacques' direct observations of the basic service problems of developing countries, and the urgent need to design policies tailored to their specific institutional features, prompted him to review critically the existing economic models of public incentives and regulations that underpin the regulatory policies of the industrial countries. This critical assessment of existing theories, together with Jean-Jacques' pragmatism and sensitivity to cost effectiveness in addressing social concerns in developing countries, led him to revise and extend traditional public economic theory to make it more relevant to their needs. These new theoretical developments and their empirical tests are evident throughout the book, especially in chapter 2, where he derives optimal regulations taking into account the characteristics of developing countries, in chapter 3, where he identifies and tests conditions for effective privatization in developing countries, in chapter 5, where access pricing rules for developing countries are derived, in chapter 7, where the design of regulatory institutions in developing countries is addressed, and in chapter 8 where the need for separation of regulatory powers in developing countries is discussed.

It is unfortunate that Jean-Jacques' untimely death did not let him see the full fruits of the establishment of one of the world's best economic research institutes, IDEI in Toulouse. However, Jean-Jacques' work on regulation and economic development will have a lasting impact on development economics – and, more importantly, on the daily life of the world's poor.

## Preface

This book is an expanded version of the Caffè Lectures I gave in 2001 at the University La Sapienza in Rome. I thank the Department of Economics of La Sapienza for inviting me to give these prestigious lectures and for making my stay in Rome such an enjoyable experience.

Along the years I have benefited from discussions with Antonio Estache, Paulina Beato, Luis Guasch, and Ioannis Kessides on the topics of this book. I have also used joint work with my former students Cécile Aubert (chapter 7), Mathieu Meleu (chapters 3 and 8), and Xinzhu Zhang (chapter 6). I thank Hossein Farzin for useful comments on the final draft.

Finally, I thank once more my outstanding secretary Marie-Pierre Boé for typing the manuscript.

Los Angeles, December 2002

## Introduction

Using incentive theory elaborated in the 1980s to model regulation as a problem of control under incomplete information, the new economics of regulation (Loeb and Magat, 1979; Baron and Myerson, 1982; Laffont and Tirole, 1986, 1993 (hereafter LT)) has provided a useful normative framework for the reforms of public services in developed countries. However, this literature has paid no attention to the specific characteristics of developing countries.<sup>1</sup>

Simultaneously, the privatization, deregulation, and liberalization movement of the 1980s which started in the United Kingdom and the United States and then extended to Europe and some countries of Latin America (Chile and Argentina in particular) has provided a lot of useful experiences. Under the pressure of international banking institutions (IMF, World Bank), developing countries have been forced to liberalize their public services as the developed world had just done.

Advisers in LDCs could rely only on the experience of the developed countries and on an intellectual framework also designed for those countries. Not surprisingly they have essentially repeated the precepts designed for the developed world and paid little attention to the characteristics of LDCs.

<sup>1</sup> We will use the expressions “developing countries” and “less developed countries” (LDCs) interchangeably.



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Some economists at the World Bank were quite aware of the risk early on and have accumulated precious knowledge on some of the leading reforms in the world often hidden in internal reports but increasingly available in academic publications.<sup>2</sup> In terms of countries, Argentina and Chile have generated more than their fair share of empirical assessments of regulatory problems resulting from reform.<sup>3</sup> In terms of sectors, the telecommunications sector was generally the first to be subject to major reforms, followed closely by the electricity sector, and both sectors have encountered major regulatory crises reflecting the importance of the issues discussed in this book.<sup>4</sup> To put things in perspective, it may be useful to quote an estimate of the welfare gains from utilities reform in Argentina.<sup>5</sup> Relying on a general equilibrium model, Chisari, Estache, and Romero estimated that the welfare gains from privatization and deregulation added up to at least 0.9 percent of GDP if all efficiency gains from reform were transformed into rents for the new owners of the utilities sector. Effective regulation which would ensure the redistribution of the gains from reform to the users through lower tariffs would eventually add the equivalent of 0.3 percent of GDP in welfare, with most of these gains accruing to the poorest.

It is the purpose of this book to start the work of building a theory of regulation for LDCs. In this effort, I could rely on little or no literature. The results reported in this book should be considered as only a first step towards a more comprehensive theoretical framework. They relate to the impact of various characteristics of LDCs on the theory of regulation,

<sup>2</sup> For general overviews see Basanes and Willig (2002), Estache (2001), Guasch and Spiller (2002), or Ugaz and Waddams-Price (2003).

<sup>3</sup> On Argentina, for instance, see Chisari, Estache, and Romero (1999); Abdala (2001); Artana, Navajas, and Urbiztondo (2002); Estache (2003), and, on Chile, see Bitran and Serra (1998).

<sup>4</sup> For overviews on telecom, see Berg and Gutierrez (2000); Wallsten (2001); Estache, Valletti, and Manacorda (2002); for electricity, see Estache and Rodriguez-Pardina (2000); Bacon and Besant-Jones (2001).

<sup>5</sup> See Chisari, Estache, and Romero (1999).

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which struck me as important in my limited experience in Africa, Latin America, and China. I hope they will provide useful starting points for more in-depth studies, or further study.

The analysis is essentially theoretical because I feel that the greatest weakness of the current situation is the lack of a theoretical framework. Sometimes I have ventured to perform some quantitative analyses, which are very exploratory and designed to illustrate the theory rather than proving empirically robust results.

Chapter 1 gives an overview of the major regulatory issues in LDCs. The liberalization of an industry of services distinguishes segments which can be opened to competition from segments which remain natural monopolies and must be regulated. First, we discuss the structural issues raised by the design of the regulatory agencies and those concerning the design of the proper market structures. For the segments that remain natural monopolies the main question is then: what use can be made of the new incentive regulation introduced in developed countries? The success of promoting competition in some segments of the industry (such as electricity generation, or long-distance telephony) relies crucially on the proper pricing of access to the segments which remain natural monopolies (such as the transmission grid in electricity or the local loop in telephony). The various paradigms of access pricing are reviewed. What kind of competition policy is the next important issue of a deregulation program. Finally, we discuss how universal service obligations can be maintained in a competitive environment.

Chapter 2 deals with the essential rent extraction–efficiency trade-off present in the regulation of a segment of the industry which remains a natural monopoly. Indeed, asymmetric information obliges the regulator to give up costly information rents to regulated monopolies and distorts efficiency to mitigate those rents, for example by pricing above marginal cost. After presenting a simple model of regulation

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and reviewing the relevant characteristics of LDCs affecting this question, we discuss how these characteristics affect the rent extraction–efficiency trade-off. Data about concession contracts in Latin America are then used to illustrate the determinants of this trade-off.

Privatization of services is also often recommended by the economists at the World Bank and many of the other multi-lateral and bilateral aid agencies. After reviewing the literature which examines the pros and cons of privatization we develop in chapter 3 a positive theory of privatization. We argue that politicians in power privatize only when the benefits they derive from privatization are greater than those they previously obtained from public firms. This leads to the conjecture that the rate of privatization has an inverted U-shape as a function of the level of corruption. This conjecture is tested with African data.

An implicit assumption of the theory of regulation for developed countries is that regulatory contracts are enforced by a Court of Law. However, this assumption of perfect enforcement presumes a quality of institutions which does not exist in LDCs. Accordingly, we propose in chapter 4 a theory of imperfect enforcement. Sometimes the regulator cannot prevent opportunistic renegotiations by firms. Countries invest in enforcement to limit these costly renegotiations. The theory yields a structural equation for the level of enforcement expenditures which is tested with cross-country macrodata and microdata.

As already noted, access pricing is a complex issue crucial to the success of liberalization. Chapter 5 discusses the different types of problems arising in pricing access from the point of view of LDCs. Should vertical disintegration be preferred to vertical integration of the incumbent monopoly? Which kind of pricing rule is best for the one-way-access problem, such as access of long-distance operators to the local loop? When competition of infrastructures is possible (mobile telephony,

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for example), should reciprocal access prices be regulated, and how?

In chapter 6 a model of optimal development of the network in rural areas for public services such as electricity or telecommunications is proposed to illustrate the universal service issues relevant for developing countries. Particular attention is devoted to the possible capture by interest groups of regulators for this politically highly sensitive issue.

The design of proper regulatory institutions is a key question for developing countries, which start from scratch and have the opportunity to use historical experience. Chapter 7 discusses the various trade-offs that theory has uncovered for choosing between centralized versus decentralized regulatory institutions, multi-industry or mono-industry regulation, multifunctional or monofunctional regulation. In each case we examine how the characteristics of LDCs affect these trade-offs.

Finally, in chapter 8 we study more formally the question of the separation of powers for regulatory institutions. We construct a model to see how a duality of regulators can help deal with the crucial issue of capture. Again, we pay particular attention to how the characteristics of LDCs affect the optimal choice between one or two regulators.

A conclusion (chapter 9) summarizes our basic findings and discusses the need for further research.