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.[1]

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.

[1] We will use the expressions "developing countries" and "less developed countries" (LDCs) interchangeably.

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.[2] In terms of countries, Argentina and Chile have generated more than their fair share of empirical assessments of regulatory problems resulting from reform.[3] 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.[4] To put things in perspective, it may be useful to quote an estimate of the welfare gains from utilities reform in Argentina.[5] 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,

[2] For general overviews see Basanes and Willig (2002), Estache (2001), Guasch and Spiller (2002), or Ugaz and Waddams-Price (2003).

[3] 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).

[4] 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).

[5] See Chisari, Estache, and Romero (1999).

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 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 multilateral 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, 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.

1

Overview of regulatory issues

1.1 Introduction

This book focuses on public utilities, telecommunications, electricity, gas, water, transportation (roads, railways, buses, ports, airports, . . .) and the postal service which are sometimes referred to as "economic infrastructures." It does not concern itself with the so-called "social infrastructures" such as education and health, or with financial infrastructures. This chapter will discuss the specific questions surrounding the regulation and liberalization of public utilities in developing countries.[1] We first review the characteristics of developing countries that have a bearing on the analysis of regulation and competition policy.

An essential concept is the marginal cost of public funds – that is, the social cost of raising 1 unit of funds. This cost includes in particular a deadweight loss[2] because governments raise revenues by means of distortionary taxes. It is estimated that this deadweight loss amounts to around 0.3 in developed countries, meaning that it costs citizens 1.3 units of account every time the government raises 1 unit. The inefficiency of tax systems in developing countries, coupled with the corruption that is sometimes also present, makes

[1] See chapter 3 for a discussion of privatization in developing countries.
[2] The deadweight loss depends on the type of tax used, because the tax systems are not usually optimized.

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it extremely difficult for governments to invest in infrastructures and affects the cost of all types of public interventions, in particular, regulation and competition policy. According to World Bank data, the deadweight loss in developing countries is well beyond 1.0. It has been estimated at 1.2 in Malaysia and 2.5 in the Philippines, while in Thailand it ranges between 1.2 and 1.5 (Jones, Tandon, and Vogelsang, 1990). In developing our analysis we take the high cost of public funds as a given because, although tax reforms are necessary in many developing countries, it is unlikely that they will be in place quickly owing to the many financial, human and political constraints involved.

An essential instrument of regulatory and competition agencies is the ability to audit costs. Yet, developing countries are hampered by the absence of well-developed accounting and auditing systems (Trebilcock, 1996; Campos, Estache, and Trujillo, 2003). This is due to the lack of proper training programs; to the political and social difficulties that hamper the payment of incentive salaries to auditors to reward effort and discourage corruption; to the lack of up-to-date technology such as computerized systems (which makes it harder to discover cost padding and evaluate real costs); and to the inability to impose high penalties in cases of documented wrongdoing (because of the strong limited liability constraints of most economic agents).

Many developing countries also suffer from widespread corruption due, in particular, to the low internal costs of side transfers. When two parties (such as a firm and an auditor or a bidder and the auction organizer) arrange a private deal, they must take into account the costs of being discovered and the need to use indirect compensation (which is less efficient than direct compensation). The cost of these side-transfers is expected to be lower than in developed countries because they are more difficult to identify and, in addition, social norms may place a positive value on some types of side transfers (for example, when they take place within families, villages, or ethnic groups). Accordingly, it is more difficult to fight corruption (Tirole, 1992).

Inefficient credit markets and the sheer lack of wealth make limited liability constraints more binding in developing countries. It is important to stress this point because many of the problems in regulation and competition policy result from difficulties in borrowing and attracting foreign capital. It is also worth highlighting the complementarity of general competition policy and good banking sector regulation. When the banking sector is inefficient and makes borrowing costly or impossible, an effective competition policy may destroy the rents that allow firms to invest, or may create instability.[3]

Other characteristics that hamper public utility regulation concern the government. In particular, two characteristics of developed countries that are often missing in developing countries are constitutional control of the government and some degree of ability to enter into long-term contracts. The lack of the checks and balances typical of well-functioning democracies (supreme courts, government auditing bodies, separation of powers, independent media[4]) makes the government an easier prey to interest groups and patronage. The lack of democracy and well-functioning political institutions increases the uncertainty of future regulations and makes it difficult for the government and the regulatory institutions to make credible commitments to long-run policies. Consequently, the economic policies of developing countries are even more sensitive to ratchet effects and renegotiations.

Another shortcoming of developing economies is the weakness of the rule of law. Poor enforcement of laws and contracts

[3] Mishkin (1997) concludes that "developing countries may need to move slowly in financial liberalization in order to keep a lending boom from getting out of hand."

[4] See Besley and Burgess (2001) for an empirical study of government responsiveness to media activity.

biases contracting towards self-enforcing contracts or leads to costly renegotiations.

Finally, it is essential to stress that the liberalization and deregulation of public infrastructures in developing countries often fails to attract the level of foreign capital that is necessary.

These features will be kept in mind throughout the discussion that follows, and when necessary specific advice for dealing with these difficulties in regulating and promoting competition in public utilities will be presented.

Section 1.2 discusses the structuring of regulatory agencies that favor competition, and the trade-offs involved in choosing whether or not to engage in the vertical disintegration of incumbent monopolies between the competitive segments and the natural monopoly ones. Section 1.3 presents the regulatory rules required by the monopoly segments in developing countries. The crucial issue of the management of the interface between the monopoly segments and the competitive segments is addressed in section 1.4 where access-pricing rules adapted to developing countries are discussed in greater detail. Section 1.5 is devoted to competition policy *per se* for the segments opened to competition. Universal service obligations are discussed in section 1.6. Concluding comments are offered in section 1.7.

1.2 Structural issues

The structure of regulatory agencies

A first consideration in structuring the government entity that will have responsibility for regulation and competition policy is whether these functions should be allocated to one integrated agency or separate ones.[5] In this regard, recent experiences in Australia and New Zealand are enlightening.

[5] Useful readings on the design and structure of industries include Abdala (2001) on Argentina, Bhatiani (2002) on India, and Mueller (2001) on Brazil.

New Zealand developed a very novel approach to regulation, relying only on general competition laws enforced by the courts and by an industry-wide competition authority. This approach was first used to regulate telecommunications and then electric power. The notion of self-regulation by industry was also introduced. In this case, industry participants form councils to negotiate the main rules and access conditions.

Although the New Zealand experiment was not an immediate failure, the government recognized, after some years, that there was still a need for regulatory control of industries that are not competitive enough. Indeed, this proved necessary even in telecommunications, which is the most competitive industry of the ones we are considering here. The concern is that light control of the industry is not sufficient to contain abuse of dominant position. The number of cases brought before the courts shows that rapid technological change and the technology-intensive nature of the industry make it difficult to find a firm guilty of abuse of dominant position. Moreover, the procedures involved make for very long delays. As a result, relying solely on competition laws has proved inefficient even when these laws are well developed and enforced. On the basis of this experience, therefore, we can conclude that eschewing regulation is not the right option.

Integrating general competition policy and regulation into a single agency is possible only if the regulatory agency is a multi-industry one, as in Australia. Australian regulation is organized around a federal multisectoral agency (the Australian Competition and Consumer Commission, ACCC), specialized agencies, and regional regulation. The ACCC is composed of sectoral and functional bureau and coordination entities. The Commission deals with product safety, consumer protection, access, mergers, and restrictive trade practices in all the sectors under study in this report.

The ACCC was created in 1995 following the recommendations of the Himler Report. It has taken over a significant part of the duties of specialized regulators by acquiring