



X-factor regulation in a developing country: The case of Lima's airport



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ARTICLE INFO

Available online 6 April 2015

Keywords:

Airport regulation
Incentive regulation
RPI–X
X-factor
Price caps

ABSTRACT

In theory, X-factor regulation provides better incentives for cost reduction than previously widely-used rate-of-return regulation. However, a deeper look into how this factor is effectively estimated shows the regulator enjoys a great deal of discretion, especially when selecting the methodologies used to estimate its components. As shown in this paper, discretion increases the likelihood of controversies between the regulator and the regulated firm.

This paper describes how the X-factor is estimated for Peruvian transport infrastructures and analyzes the most important controversies that arose when the X-factor for Lima's airport was estimated. Conclusions are the following: i) when the X-factor is estimated retrospectively careful planning is necessary since this option requires data that has to be collected at the time the infrastructure is concessioned; ii) cost of capital estimation is one of the main sources of controversy due to the subjective criteria used in its calculation and its impact in the final result; and, iii) transparent procedures improve the legitimacy of regulatory decisions, especially in contexts of limited public resources and weak institutions, typical of developing countries.

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1. Introduction

One of the consequences of the movement toward the private provision of public services that started in the 1980s was the surge of new regulation methodologies. The best known, proposed by Littlechild (1983), consists in allowing regulated prices to increase at a pace determined by the inflation rate and an 'X-factor' estimated as the difference in productivity between the regulated industry and the whole economy, thus mimicking the evolution of prices in competitive markets. This methodology is known as 'RPI–X'.

X-factor regulation has been increasingly adopted by telecommunications and energy regulators in a large number of countries, a tendency that can be interpreted as recognition that this methodology provides better incentives for reducing costs than the better known and previously widely-used methodology, rate-of-return regulation. In Peru, a further reason argued to adopt X-factor regulation is that it reduces the scope for discretionary decisions, which is a desirable feature of regulation in a country with a weak institutionality.

However, a deeper look into how the X-factor is effectively estimated shows that regulators enjoy a great deal of discretion, especially when selecting the components used for estimating the elements of the X-factor. Regulators decide, for example, whether

the X-factor is to be estimated forward or backward-looking, the length of the estimation period, if a correction factor needs to be introduced, and whether or not a certain option is a good proxy of a component. It is important to bear in mind that the lack of quality data is one of the characteristics of a developing economy, for which in many cases the use of discretionary criteria is warranted.

This paper deals with the methodological controversies that arose when the X-factor for the concession of Lima's airport was estimated. As we will see, these were fueled by the dearth of data, the scarcity of international experiences in airport regulation, inadequate administrative skills, and insufficient prevision regarding information requirements at the time the airport was concessioned.

Three publications document the problems of implementing price cap regulation in Peru. Ros (2001) argues that in developing economies it is essential to select the price cap methodology in a manner that properly protects consumers from unjust prices but also does not harm companies' incentives to invest. The author finds that the lack of statistical information and the effect of singular events like privatization and tariff rebalancing complicate the estimation of the X-factor in the Peruvian telecommunications industry, so he recommends to compare the result with estimations made in other countries and alerts about the temptation to re-estimate the X-factor before the end of its term (in case the monopolist achieves high rates of return), as this would distort the

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system of incentives provided by the regulatory regime.

Bernstein et al. (2006) conducted an estimation of the X -factor that should be applied to Telefónica del Perú (the incumbent telecommunications operator) for the period of 2004–2007. The methodology proposed by the authors emphasizes the consistency with the initial estimate of the X -factor and the purpose of price cap regulation.

Finally, Defilippi and Flor (2008) describe the most important methodological dilemmas that a regulator in a developing country has to face in an industry where experience in price caps is scarce. They illustrate their analysis using the price review of a Peruvian port terminal as an example. The authors conclude that in contexts characterized by weak institutional and limited competition, a backward-looking estimation of the X -factor using the TFP (Total Factor Productivity) technique is desirable. They also suggest that in industries dominated by state-owned companies, the X -factor should be estimated for the firm, not for the whole industry. Section 2.4 explains in detail the criteria used to solve these dilemmas.

The paper is structured as follows. In the following section, the institutional background of Peruvian transport infrastructure regulation and the economics behind the X -factor are explained. The third section describes the most important aspects of the concession of Lima's Airport and presents the results of the X -factor estimation. The fourth section discusses the main controversies surrounding the estimation, whilst the final section presents the conclusions of the research.

2. Economic regulation in Peru

2.1. Institutional background

In 1990, the Peruvian government embarked in a series of structural reforms aimed at changing its role in the economy, from direct provider of goods and services to investment promoter and regulator of economic activities. A large-scale privatization program was implemented, and by 1995 most of the state-owned enterprises were transferred to the private sector, including all telecommunications and the main energy sector companies. As in many other countries at the time, regulatory bodies were set to regulate natural monopolies in these industries.

In the transport sector reforms were implemented at a slower pace, mostly because the country's ports, airports and railways were natural monopolies and the government did not know how to regulate them. Unlike telecommunications and energy, international experience regulating privatized transport infrastructure was practically non-existing, and in railways it had not borne satisfactory results.

In 1999, the government followed the advice of the World Bank and created Ositran, a regulatory body in charge of regulating monopolies in four transport modes: ports, airports, railways and highways. Several months later the first port terminal was concessioned and in early 2001, the country's main airport serving Lima, the capital city, was also concessioned. Due to the lack of international experience, Ositran developed its regulatory framework borrowing methodologies and procedures used in other regulated industries such as telecommunications and electricity supply.

2.2. Ositran's regulatory rationale

Ports and airports may become natural monopolies when demand is insufficient to exhaust the large economies of scale present in their cost functions. This occurs more frequently in developing countries, where local economies are usually not large

enough to justify competing infrastructures. In these circumstances, market failures justify government intervention.

But regulation may also fail, due primarily to three forms of government failures: (i) information asymmetries between regulators and the regulated firms about the characteristics of demand, technology and costs that may result in prices set below or above optimal; (ii) lack of regulatory commitment that may result in the expropriation of assets due, for example, to politically-motivated pricing; and (iii), regulatory capture that may result in decisions biased towards private interests (Guasch and Spiller, 1998).

Since government failures are more common than market failures (especially in countries with weak institutions) and implementing regulations is costly for society, Ositran explicitly states that regulatory intervention will only be implemented when competition is not possible (or undesirable) and the benefits of regulation are expected to be higher than costs (Ositran, 2006).

2.3. Regulatory mechanisms

One of the goals of Peruvian transport policy is to eliminate barriers that prevent the functioning of competitive markets, and, when this is not possible, to replicate the discipline market forces would impose were they present. To achieve this goal, regulation is implemented through two mechanisms: (i) access regulation and (ii) price regulation.

2.3.1. Access regulation

Even when a transport infrastructure is a natural monopoly, it is possible to introduce competition in some markets such as pilotage in ports or ground handling in airports. However, since monopolists have incentives to restrict competition in related markets to recover rents foregone by regulation (Paredes, 1997); it is necessary to regulate the conditions under which firms providing these services are given access to the monopolized facilities. Efficient prices would then be set by market forces.

A theoretical principle commonly used to regulate access is the 'Essential Facilities Doctrine', under which firms with substantial market power must grant access to their facilities to their competitors under 'reasonable' conditions (Maddock and Marshall, 1997). The Peruvian regulator has adopted this mechanism and its Access Regulation states that it will only intervene after direct negotiations to settle disputes between incumbents and access seekers, or when the parties are unable or unwilling to reach an agreement (Flor and Defilippi, 2003). Price regulation, then, is only implemented in markets where competition cannot be introduced (Ositran, 2003).

2.3.2. Price regulation

According to Guasch and Spiller (1998), RPI– X is the second and most common mechanism for market intervention (the first is rate-of-return regulation). Under this mechanism, the monopolist is allowed to raise its prices at the rate of the Retail Price Index (RPI or inflation rate), minus some amount (the ' X ' factor) estimated to reflect the difference between the industry's expected increases in the productivity and that of the economy as a whole.

There is a large amount of literature¹ regarding the advantages and disadvantages of price cap regulation in general and RPI– X in particular. However, none of it presented an effective guide to estimate the X -factor until Bernstein and Sappington (2000). According to these authors, regulated prices are allowed to increase

¹ See: Beesley and Littlechild (1989); Braeutgam and Panzar (1989); Brennan (1989); Lewis and Sappington (1989); Schmalense (1989); Armstrong et al. (1994); Crew and Kleindorfer (1996), and Laffont and Tirole (2000), among others.

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