Does Independent Regulation of Public Utilities in Developing Countries Improve Efficiency?

An evaluation suggests that introducing independent regulation to the electricity industry in developing countries is effective in stimulating performance improvements, leading to greater generation and better quality of service. The impact on energy efficiency is positive but insignificant.

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I. Introduction

Regulatory systems for infrastructure sectors are a relatively new but important phenomenon in many developing countries. It has been estimated that close to 200 new infrastructure regulators have been created around the world in the past 10 years (Brown et al., 2006). These regulatory systems are designed to respond to natural monopolies and market failures associated with network industries such as electricity, gas, water, telecommunications, and transportation. The aim of regulation is to encourage efficient, low-cost, and reliable service provision while ensuring financial viability and new investment. The expectation is that regulation mechanisms can depoliticize tariff setting, reduce costs, improve service quality in a cost-effective way, stimulate the introduction of new products and services, and stimulate efficient investment. Therefore, the establishment of an

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independent regulation agency (IRA) should lead to improved economic performance.

The electricity sector has three components: generation, transmission, and distribution. In most countries this sector is a strategic activity with natural monopoly characteristics resulting from the existence of economies of scale and scope. Regulation is required especially in the areas of electricity supply that remain dominated by one or a very small number of operators, to prevent monopoly abuse. In many countries, instead of direct regulation by a government department, the establishment of independent or quasi-independent regulatory agencies has been favored, drawing on the regulatory models of the United States and the United Kingdom. This form of independent regulation is expected to encourage private capital to invest in capacity in the face of a potential holdup problem under conditions of incomplete contracts (Spiller, 1996). Despite these good intentions, there is little evidence that these regulatory systems have met their expectations. Indeed, the literature on estimating the effect of regulatory governance arrangements on infrastructure outcomes is relatively small to date, particularly for the electricity sector (Jamasb et al., 2004). A particularly important study is that by Kirkpatrick et al. (2008), who explore the impacts of competition, privatization, and regulation on electricity sector performance[1] in 36 developing and transitional countries. In their results, the regulation variable is not a significant, correctly signed explanatory variable in any of the regressions reported. However, in this paper, the regulatory variable is a dummy which is not dated; for instance, a country like Ethiopia establishing an independent regulatory body in 1999 scores 1 for the whole of the estimation period, as would Costa Rica, which did so in 1928. Therefore, the experience of the regulator is not taken into account in their model.

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Bortolotti et al. (1998), who use data on the privatization of electricity generation in 38 countries between 1977 and 1997, find that effective regulation is a prerequisite for the success of privatization. Cubbin and Stern (2006) conclude that the quality of regulatory governance is positively and significantly associated with higher per-capita generation capacity levels and that this positive effect increases over time with the reputation of the regulator.

Empirical testing of the performance of regulation seems to concentrate on case studies and the application of panel-data econometrics (Guasch et al., 2007). These methods cannot allow a statistically robust separation of the effects of other changes like privatization from the impact of the establishment of an independent regulatory agency. Therefore, we propose to interpret the introduction of an independent regulator as a natural experiment,[2] in order to re-establish the conditions of a randomized experiment and represent the IRA as a treatment. This leads us to perform propensity score matching as an alternative to the widely used regression approach. We seek to overcome the methodological limitations of the usual regression techniques by letting the data select the controls for IRA establishment. Even if the effectiveness or quality of regulation may differ depending on the country, we seek more to assess the impact of country's propensity to undertake such regulatory reform. This article attempts to provide evidence on the positive or negative impact of independent regulation on electricity supply, and then builds foundations for future reforms in a sector representing one of the biggest challenges for developing countries, particularly in Africa (World Bank, 2010).

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