

# Success of Political Reform in the Electricity Sector in South America

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## Abstract

Certain countries of the South American continent are among the world's pioneers in deregulating and liberalizing their electricity industries (e.g. Chile and Argentina). On the other hand there are also countries rather opting for a moderate reform process and frequency as Paraguay or Uruguay. This diverse picture makes South America an interesting subject of study for the assessment of electricity sector reform policy success, given that different kinds of policies had been applied over the last two decades.

The value chain of the electricity industry consists of possibly competitive generation and retail levels as well as the network infrastructure level with its monopolistic bottleneck character. Given full integration of supply companies, a first group of reforms has the target to obviate possible discrimination of generation competitors, who are reliant on non-discriminating network access. Therefore Third Party Access and Ownership Unbundling are among the most popular state activities and also of prior interest in this study. Especially latter is in the public focus and vividly discussed by political key institutions, as it is not clear whether positive long run effects outbalance restructuring costs. This sort of reform is often accompanied by the complementary introduction of wholesale markets to implement an explicit market place and increase transparency of generation pricing and thereby competition.

On the infrastructure level itself, regulatory institutions are often introduced to regulate transmission and distribution pricing. Independently of the method underlying the price setting, network charges (and end user prices) should in tendency decrease as a response to regulation.

Concerning the last level of the value chain, the opening of retail markets is – above all – the precondition for the development of competition. This should be sharply distinguished from the abolishment of end price regulation. It is quite widespread that state agencies allow customers to switch their supplier, but at the same time pursue end price regulation. Of course, under these circumstances, prices will only to a limited extent behave according to market conditions and respond to policy reform.

A last very common accompanying policy is privatization. One would expect positive effects from private ownership, because of the additional control of shareholders. This should hold for all levels of the value chain.

We have analyzed the above relationships of the respective reforms and electricity end prices (net of taxes) employing regression models using panel data. The data embraces a time span from 1994 to 2007 and comprises nine countries (making 126 obs). End prices have been collected for residential and industrial customers. The countries' GDPs per capita serve as a control variable. Monetary values were calculated in US\$ and have been adapted to inflation. Several regression methods and model specifications have been used to work out the robustness of estimations. The usual tests on heteroscedasticity suggest the choice of a White HCC-estimator or WLS. Further, Hausman-tests make a clear indication for fixed effects (FE). All exogenous variables have also been estimated including several lags. To check for possible dynamic in the endogenous variable and to obtain better behaviour of the right-hand-side variables regarding endogeneity, a first-differences instrumental variable model was specified (Andersen-Hsiao estimator (1982)). Due to the small sample size we renounced on (potentially more efficient) GMM estimation.

Generally, residential end prices seem to be immune against any of the regulatory reforms. This does not seem to be surprising as regulation of residential electricity prices was not

abandoned. Industrial prices by contrast are more interesting: A dynamic estimation shows that short term negative effects of ownership unbundling are approximately cancelled out by later positive impacts (restricted Wald-test on the overall effect of the reform insignificant). Third party access seems to allow taking the benefits but avoiding the costs of ownership unbundling. The implementation of electricity exchanges has a positive impact on end user prices and thus appears to reveal real costs and risk of electricity production. The independency of regulatory authorities shows to have moderate lagged price decreasing influence. As a logical consequence of a comparison of the analysis of residential and industrial prices it is shown that reforms had redistributing impact in favour of industrial customers.

Further, the descriptive analysis of variation coefficients between end user prices in South America, the object under study, seems to show that market coupling activities merit further expansion.

We further demonstrate possible fallacies policy analysis could incur in choosing a static framework. To our knowledge, also academic research has exclusively chosen static frameworks ignoring the frequently dynamic/lagged impacts of reforms.

Summarizing, one of the major conclusions to be drawn is that Ownership Unbundling does not seem to be the effective means if one wants to have decreasing electricity end prices. Contrarily, South American countries seem to have achieved the same by less invasive Third Party Access. Residential end user prices do not show any significant change. This can be seen as a consequence of persisting residential electricity price regulation not allowing prices to be built according to market conditions. Contrarily, non-regulated industrial electricity prices respond to regulatory reform, even if there are remarkable lags.

**Key words:** regulatory reform, ownership unbundling, third party access, dynamic panel estimation, South America

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