



# Political pricing of electricity – Can it go with universal service provision?<sup>☆</sup>

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## ABSTRACT

Political parties in India are known to use electricity prices as a tool to secure a win in the democratic election process. This article examines the setting of electricity prices from a political economy perspective. Citizens differ in their willingness to pay for electricity, and the consumer surplus and electoral uncertainty seem to influence their choices while exercising their franchise. To win, political parties must receive a majority of votes, and a party in power may try to achieve this by choosing to ignore a consumer group, either by charging a price higher than their willingness to pay or by choosing to satisfy them by charging a lower price. Two theoretical models are proposed: the first model computes the possible prices when common (perfectly correlated) electoral shocks are anticipated, while the second model computes the possible prices for independent and identically distributed electoral shocks. We test these models with available data on willingness to pay and electricity price for Agricultural, Domestic, and Industrial consumers in an Indian State by generating prices that would be charged to each of these types of consumers to maximize the chances of re-election. Actual prices seem to confirm the second model more than the first.

## 1. Introduction

The political economy of the electricity sector has been widely studied in the last few decades. As electricity is an indispensable commodity for modern civilization, considerable importance has been placed on uninterrupted availability of electricity at a reasonable price. As the supply of electricity has serious welfare implications, price rises have generally been greeted with disapproval and, in some cases, even violent protests from the general populace.

The first instance in India of electricity prices being used as a tool for winning elections was in the Indian state of Andhra Pradesh (Dubash and Rajan, 2001; Birner and Sharma, 2011). The political parties offered free power for farmers, as they expected that support from large groups of farmers would help them win the elections. Subsequently, virtually all political parties in India have succumbed to the lure of winning elections by offering free or almost free electricity for various sectors of society. This has led to large-scale distortion of electricity prices in India.

With the advent of privatisation in the electricity sector in many developing countries in the latter half of the 20th century, there was a

focus on setting prices that meet several public policy objectives, namely ensuring that the interests of the consumers and investors were taken into account, that the productive, allocative and dynamic efficiencies were maximized, that utility was financially viable,<sup>1</sup> and that prices were just and contributed to universal service goals (Kessides, 2004). The goals often contradicted each other. Second best pricing, as advocated by policymakers, tried to strike a balance between economic efficiency and balanced budgets but could not address the aspect of universal service provision<sup>2</sup> (See Fig. 1). However, 'second best pricing' with a balanced budget constraint can still meet a Universal Service Obligation even where one or more consumer segments have a willingness to pay that is less than the marginal cost of supply 'provided' an adequate government funded "concessions" or "subsidy" scheme exists for low income households.<sup>3</sup> That is, where a private utility charges prices that collectively equal average cost, the budget will be balanced, and universal service can be achieved when low income households are given subsidies or utilities are awarded rebates on behalf of those customers. In many cases policymakers, did not implement the reforms advised by policy advisors to avoid political risk.

This article examines electricity pricing from a political economy

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<sup>1</sup> Bonbright et al. (1961), provides a detailed discussion on the resource-allocative and self-sufficiency objectives in public utility rate making.

<sup>2</sup> It may be noted that even with a balanced budget constraint and with willingness to pay of one or more consumer groups falling below the cost of supply, the second best pricing can still provide universal service provided that the government grants adequate subsidy.

<sup>3</sup> We owe this insightful comment to an anonymous reviewer of this journal.

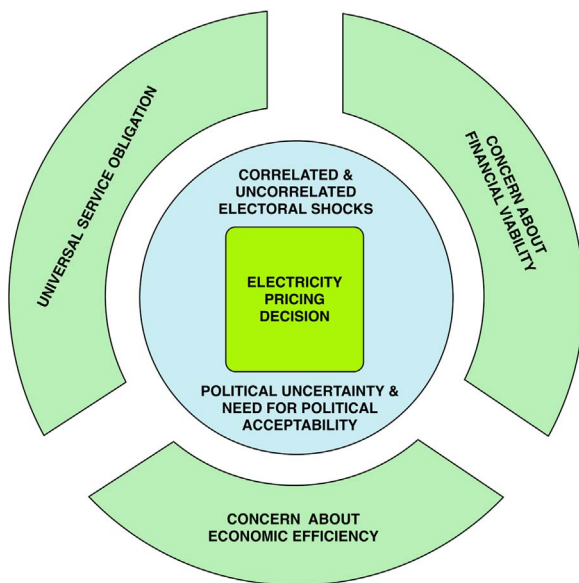


Fig. 1. The social, economic, and political influences on electricity pricing decision.

perspective. We advocate a pricing policy that ensures the financial viability of the utility and look for instances when the government in power will opt for a pricing policy that ensures universal service provision, with the objective of winning with a majority.<sup>4</sup> We comment on whether the political prices that emerge satisfy economic efficiency conditions. We propose two theoretical models to study electricity prices that are designed with the objective of winning elections. We also check on how closely prices predicted by the theoretical model match with the actual data obtained on electricity prices in an Indian state.

In a country like India, the need of the political parties to be re-elected exerts significant influence on public policy decisions. Any analysis of policy decisions that does not take this factor of political acceptability into account is bound to be a futile exercise. In the literature, several researchers have discussed in detail the issue of political economy of electricity prices (Brown et al., 2017; Lien, 2008; Simshauser, 2014). There has also been considerable literature on the political economy of electricity pricing in an Indian context (Sankar and Ramachandra, 2000; Dubash and Rajan, 2001; Kale, 2004; Joseph, 2010). The country's power sector was plagued by a host of factors such as significantly large unmet demand, unreliable electricity supply, prevalence of cross subsidies and loss making power utilities (Vagliasindi, 2012). A series of sectoral reforms initiated during the last three decades tried to address these issues (Baijal, 1999; Bhattacharyya, 2005; Nagayama, 2007). The electricity prices of certain consumer classes were kept below the cost of supply, while for certain others it was significantly higher.

Rajan (2000) documents the strong influence of the agricultural lobby in keeping the tariffs low for agrarian consumers and the governments deriving political mileage out of such patronage. Singh (2006) discusses the pre-reform market structure and the forces that initiated and shaped the electricity sector in India, while arguing that the long-term sustainability of the sector depends on delinking political interference in decision making. In one of the earlier and comprehensive articles on the political economy of power sector reforms in India, Tongia (2003) describes how the State Electricity Boards in India evolved as objects of political patronage and the political nature of pricing decisions. Typically, the electricity rates were low for the

politically important consumer groups such as domestic and agricultural consumers.

But despite this obvious influence of politics on pricing, the researchers in general have not paid adequate attention to both factoring this overarching political influence on electricity pricing into formal policy decision models and working around these constraints to achieve the social and economic optima. This article attempts to advance the scientific methods in this path to provide a clear direction for policy advisors on electricity pricing in the context of political uncertainties and seeks to arrive at a range of prices that satisfy the objectives of both the policymaker and the Government. This approach introduces the hitherto neglected, but extremely important, factor of political acceptability of electricity prices into a formal framework of analysis.

The article is structured in the following manner. Section 2 details the theoretical models, both from the perspectives of common electoral shock and of the independent and identically distributed electoral shocks. Section 3 discusses the empirical example from an Indian context. Section 4 concludes with a discussion on policy implications.

## 2. The models

This article discusses two theoretical models to explain the politically appropriate prices for electricity that help the incumbent government to win the elections. The first model examines the possible prices when common electoral shocks are anticipated. A common shock is one where an electoral shock has either favorable or unfavorable effects on all sections of the population in the same direction and by the same magnitude. If it is a positive electoral shock, the government need not worry much about its policies, as they would not matter much. If it is a negative shock, the chances of winning are low, and the government must ensure that public policies are designed to obtain at least the required majority votes. Under such circumstances, it is always the case that a section of society will be ignored. The second model assumes that the anticipated electoral shocks are Independent and Identically Distributed (IID). As the electoral shocks between sections of the population are not correlated in this case, it is not prudent for the government to either consciously favor or discriminate against any section of the society to maximize its chances of re-election.

The electricity prices are known to be a politically sensitive domain. This article seeks to answer the question of how the electricity prices are influenced by the political process of having to win the elections. The model builds on the earlier work by Seabright (1996) and Gupta (2001). We assume that there are three consumers, each with a demand for electricity of one unit, and the total demand for electricity is, thus, three units. Consumer  $i$ , where  $i = \{1, 2, 3\}$ , has a willingness to pay  $w_i$  for a unit of electricity, and  $w_1 > w_2 > w_3$ . To maximize the chances of re-election, the incumbent government seeks to offer electricity to the citizens at an appropriate price. Thus, the total demand for electricity is 3 units, the marginal cost of supplying a unit of electricity is  $c$ , and we assume the fixed costs to be zero. We also assume that there are enough resources in the sector to ensure universal service obligation to provide electricity to all citizens, i.e.,  $\sum w_i > 3c$ . The government must decide on a price  $p_i$  for every consumer, such that it maximizes its probability of re-election. If  $p_i$  is set above  $w_i$ , consumers choose not to buy electricity and have a reservation utility of zero. If  $p_i$  is set below  $w_i$ , consumers choose to buy electricity, as they would enjoy a positive consumer surplus, and the probability of voting for the incumbent government is higher than in the situation when the consumer chooses not to buy electricity. The Government must decide on a price  $p_i$  for every consumer, such that it maximizes its probability of re-election.

The uncertainty in the process of elections is captured by a random variable  $\epsilon_i$ . This random variable is assumed to have a uniform distribution in the range  $[-q, +q]$ , with a mean of zero. Let  $e_i$  denote the event where the consumer  $i$  votes in favor of the incumbent government. If  $R_i$  is the reservation utility of consumer  $i$ , she votes for the incumbent government only if

<sup>4</sup> As electricity pricing is one of the policy measures that influences the chances of winning in elections, this analysis assumes that all other influencing variables are optimally set. We thank the anonymous reviewer for bringing out this aspect.

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