

## Under-pricing electricity and the puzzle of regulatory accounting

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State-owned electricity supply industries, particularly in developing countries, find it hard to finance investment from either internal funds or borrowing from the state, and thus are under increasing pressure to turn to the private sector, either via privatisation or by long-term contracting with the private power producers. In both cases a typical problem is that electricity prices are below the long-run marginal cost (LRMC) required to adequately compensate new investment. If investment is needed, then privatisation with a competitive wholesale market will be unsuccessful unless prices rise to LRMC. If that happens after privatisation, private investors stand to make a politically unacceptable windfall profit on the existing assets. If prices are raised to LRMC before privatisation, then many of the reasons for privatisation (inability to finance investment) may no longer apply. Avoiding that dilemma via contracting with private power producers risks the credibility of those contracts, as consumer advocates will criticise the mismatch between the high contract price and the lower electricity purchase price from the state-owned enterprise, particularly when the retail price needs to be increased. As the share of contracted power increases, either retail prices must rise, or the electricity supply company faces bankruptcy, common features of the Indian electricity industry.

One common feature of many electricity industries, and notably of generation, is that the book value of assets is far below their modern equivalent asset replacement cost. There are two possible explanations of this – the first is that with inflation the original book value of the asset under Historic Cost Accounting (HCA) will fall increasingly below its replacement value. The second is that assets are typically depreciated on a straight-line basis over a conservative estimate of its lifetime, so that fully depreciated assets may still have considerable economic life remaining.

This paper investigates whether this accounting approach can explain the systemic under-pricing of electricity in state-owned enterprises and shows that, while it may be able to account for a modest amount of under-pricing, it seems unlikely to be the main explanation. Instead the real reason seems to be a systemic failure to charge an adequate real rate of return on capital in state-owned enterprises, which, for capital-intensive enterprises like electricity, leads to serious under-pricing of not only capital but output, and a consequential difficulty in financing new and replacement investment.

The first question to answer is whether traditional cost-of-service regulatory accounting as practised in, for example, the U.S. under HCA conventions, will systematically under-value assets and lead to regulated prices that are below the LRMC, i.e. the price (and price projections) needed to compensate new investment. If not (and that seems to be the case) the logical inference is that the capital cost component of the price is too low, implying too low a required rate of return. The paper presents a variety of evidence supporting the view that the state systematically sets too low a rate of return. The final question is how prices should be set to ensure that investment can be financed when needed.

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