

A Quarter Century Effort Yet to Come of Age: A Survey of Electricity Sector Reform in Developing Countries

Tooraj Jamasb, Durham University, Durham, UK

Rabindra Nepal, Charles Darwin University, Darwin, Australia

Govinda R. Timilsina, The World Bank, Washington DC, USA

Executive Summary

More than two and a half decades have passed since the worldwide spread of electricity sector reforms including in the developing and transition countries. The reforms signified a major departure from the traditional publicly-owned vertically integrated production, transmission, distribution, and supply of electricity. Although the details of the design and extent of the reforms have varied, they set out to significantly rearrange the market structure, the involvement of the state, and regulation and oversight of the sector.

At the same time, most electricity reforms in many developing and transition countries have stalled along the way or they remain work in progress. Meanwhile, the original motivations for the reforms have persisted and the need for solutions increased. However, in recent years, there has been a decline in the empirical literature aimed at learning from the reform experience from around the world. This is while there is ample need to study the effects of reforms and learning from the cumulative experience from around the world given the gaps in evidence and inconclusive verdict on their effectiveness in the existing literature.

In this paper we survey and critically assess the empirical literature on electricity reforms. We take stock of around 25 years of experience and the literary history on the topic and explore the theoretical expectations from the reforms against their actual performance. More specifically, we mainly consider the linkages between the reforms and their (i) microeconomic, (ii) macroeconomic, and (iii) welfare impacts. The paper thus aims to fill an important gap in the existing literature and encourage further research in this important area.

Evidence suggests that electricity reforms have resulted in improved technical efficiency of the sector. Efficiency and productivity analysis techniques have been useful for assessing these effects in particular in the distribution networks. However, there are not many such studies of developing and transition countries. Moreover, the efficiency gains have not always benefitted the smaller consumers because of institutional, structural, and regulatory weaknesses. Effective independent regulation is necessary to transfer the efficiency gains to customers and to ensure that it is not only the producers and the governments who benefit from market liberalisation and privatization.

Electricity reforms are also expected to have positive macroeconomic effects as the efficiency gains are achieved and feed through the economy. However, the literature studying the macroeconomic effects of the reforms are relatively few. This is likely due to the difficulty of establishing effect paths from a sector level reform to its macroeconomic impacts. This becomes more difficult where reforms have not been complete or not achieved much of their expected outcomes. The limited empirical evidence points toward positive macroeconomic performance resulting from the reforms.

The research on the impact of reforms on welfare and the poor is fairly limited. Studies of the price effects of reforms have been difficult due to the presence distortions such as subsidies and taxes as well as the need to increase prices and implement cost-reflective pricing. A main challenge to electricity reforms in developing countries is to make efficiency and economic development aims of reforms compatible with improved access and equity objectives. Reforms can alleviate poverty only when the poor have access to commercial energy and in particular electricity. Therefore, reforms need to be supplemented with additional policy measures and accelerate electrification in order to help economic development and welfare conditions of the poor. Hence, examining the impact of reforms and specific measures aimed at the poor and provision of access should be among the main future topics for research.

A potentially useful tool for welfare analysis of reforms is social cost-benefit analysis. However, there are few such studies especially more recent examples in the literature. A methodological issue in such studies is the need to define counter-factual business-as-usual scenarios that could occur in the absence of reforms. The differences in economic properties of individual reform measures means that they can, individually or collectively, have different, or even contradicting, effects on technical efficiency, macroeconomic, or welfare outcomes of reforms. The incompleteness of many reforms and their interplay with economic, political and institutional factors compounds the challenge of assessing the impacts of reforms as a whole or individual reform measures against their expected theoretical outcomes.

Furthermore, there is a large number of small systems in developing countries and these require reform models that differ from those of large systems. The literature on these sectors remains rather limited partly due to the fact that reforming these systems have been more difficult. Finally, future research should address the emerging challenges facing the sector and reforms. For example, the reallocation of subsidies from fossil fuels towards the renewables given that they are poorly targeted is increasingly a policy option. Designing all-encompassing reforms capable of dynamically balancing economic efficiency, welfare (human and economic well-being) of the poor, and affordable energy is arguably the main strategic challenge facing the reforms. Therefore, research needs to evolve and conduct multi-dimensional assessments of the reforms.