The Political Economy of Power Sector Reform

Over the last fifteen years the world's largest developing countries have initiated market reform in their electric power sectors from generation to distribution. This book evaluates the experiences of five of those countries – Brazil, China, India, Mexico and South Africa – as they have shifted from state-dominated systems to schemes allowing for a larger private sector role. As well as having the largest power systems in their regions and among the most rapidly rising consumption of electricity in the world, these countries are the locus of massive financial investment and the effects of their power systems are increasingly felt in world fuel markets. This accessible volume explains the origins of these reform efforts and offers a theory as to why-despite diverse backgrounds-reform efforts in all five countries have stalled in similar ways. The authors also offer practical advice to improve reform policies.

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The Experiences of Five Major Developing Countries

Edited by

David G. Victor and Thomas C. Heller

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Preface

Over the last fifteen years the world's largest developing countries have initiated market reforms in their electric power sectors. This book evaluates the experiences in five of those countries – Brazil, China, India, Mexico, and South Africa. These five are important in their own right, as they have the largest power systems in their regions and their consumption of electricity is among the most rapidly rising in the world. They are the locus of massive financial investment – from domestic and foreign sources, both public and private – and the effects of these power systems are increasingly felt in world fuel markets. In addition to their intrinsic importance, these countries reveal important variations in reform efforts. Their power systems have been organized in distinct ways, have different primary fuels and technologies, and have been reformed under quite different strategies.

In the pages that follow, we explain the origins of these reform efforts and proffer a theory as to why – despite diverse backgrounds – reform efforts in all five countries have stalled in similar ways. We also suggest that our theory may have more general application to electricity reform beyond these five countries and also to reforms of other network industries.

In the broadest sense, this book advances four arguments. First, we suggest that these five countries initiated reform efforts at approximately the same time not simply because "markets" were a fad or that market-oriented elites controlled key governments and multilateral institutions such as the World Bank. Rather, a series of investment crises created political opportunities that reformers exploited in their push for markets. And while every country story varies, some elements are common across the five case studies. In most countries, electricity had become politicized and thus tariffs for politically favored groups were set at levels that did not cover costs. At the same time, many of the economies of scale that led to ever-declining costs faced technological exhaustion. The state enterprises that ran the power system got squeezed between inadequate revenues and rising costs, and state budgets were increasingly unable to cover the difference – especially for governments that were also struggling to manage the consequences of the 1980s debt crises. With a country in financial crisis it was easier to make the politically difficult choices that are intrinsic to power market reform – for example, raising tariffs and privatizing state enterprises.

Second, we show that all these countries articulated their reform strategies with reference to a "textbook" model of power sector reform – one written largely on the basis of the successful reforms in England and Wales. In practice, each country followed its own strategy in pursuit of that textbook outcome. Some started reform efforts with distribution companies; others focused on generation and transmission. Some sought large-scale privatization of the power sector, while others focused their attempts on attracting private enterprise in special niches as "independent power producers (IPPs)" that sell electricity to the grid under state-backed long-term contracts.

These varied reform strategies have not had much impact on the actual functioning of the power sector. Much more important than reforms in the power sector have been reforms in other parts of the economy – notably in state budgeting and capital markets. Wherever states have imposed hard budget constraints and where firms face real opportunity costs of capital the electric power sector has generally become more economically efficient, regardless of the particular reform strategy that the government has pursued. Other complementary reforms have also played important roles. For example, the progress with judicial reform helps to explain why some regulators have been able to issue meaningful orders while others find their dicta ignored by firms and enterprises that know the courts will not back the regulatory authority.

Third, each study has examined the effects of power sector reform on the various elements of the "social contract" that has long existed between society and state-dominated electric power systems. This contract includes varied investments in public purposes, such as the supply of low-cost electricity to poor households, as well as public goods such as protection of the environment and investment in innovation. Many analysts have feared that power sector reform would undermine that contract because profit-oriented firms would focus on their bottom line rather than these broader public services. We find little support for that fear because reformers, in practice, have generally adopted a wide array of complementary policies such as special subsidy programs and tax incentives that have sustained (or even expanded) investment in social services.

Fourth, we argue that early in the reform process a special class of firms and enterprises emerges to play a dominant role in reform. These organizations, which we call "dual firms" are marked by their strong interest in *avoiding* full-blown reform, for they thrive in the murky middle ground between the old state-dominated system and a fully open and competitive private marketplace. Dual firms, we argue, are distinctive because they are governed to perform two tasks simultaneously. On the one hand, they are able to mobilize the political connections needed to get plants financed, sited, and dispatched and to obtain the subsidies and payment guarantees that are necessary for profitable infrastructure investments. Simultaneously on the other hand, these firms are efficiently managed so that the resources they obtain are not squandered through poor operations and bloated payrolls. Performing both these tasks is exceptionally difficult; some of the organizations that do it have arisen originally through state ownership (e.g., China's Huaneng Power, Brazil's Petrobras, South Africa's Eskom, and India's National Thermal Power Corporation); others trace their origins to private enterprise (e.g., India's Reliance and Tata companies). Power sector reform has differed from the textbook model not simply because it is technically difficult to create private markets. Rather, power reforms have stalled because these dual firms know that they thrive best in the partially reformed world and have the ability to prevent full-blown restructuring of the sector.

We thank the many collaborators and reviewers who have participated over the nearly three years of this study. We launched the effort at Stanford with a February 2003 meeting on the experiences with power sector reform, at which the authors presented early drafts of their studies. Thanks to the chairmen, speakers, and discussants at that meeting for their focused critique of our methods and results: Ralph Bailey, Don Baker, David Bodde, Jim Bushnell, Ralph Cavanagh, Robert Crow, Craven Crowell, Zhou Dadi, Alberto Diaz, Shyam Divan, Alex Farrell, Charles Feinstein, Leo Feler, T.J. Glauthier, David Holloway, Arvind Jadhav, Stephen Krasner, Ron Lillejord, Hugh McDermott, Granger Morgan, Alberto Pani, Dionisio Perez-Jacome, Jayant Sathaye, P.R. Shukla, Jonathan Sinton, Bernard Tenenbaum, Jim Williams, Mason Willrich, Frank Wolak, and Kurt Yeager. We and our collaborators are grateful to the many follow-up meetings with officials in government and industry as well as academics.

In parallel with this study, the Program on Energy and Sustainable Development (PESD) participated in two studies on related topics. One focused on independent power projects (IPPs) was ably led by PESD's Erik Woodhouse. As the present study will show, IPPs are typically the primary vehicle for attracting private capital for investment in new infrastructure, and thus a retrospective on the IPP experience is an

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essential complement to the full examination of power sector reform that is presented in this book. In addition to Erik, we are grateful to the many other scholars who participated in the IPP study: Felipe Araujo, Efe Cakarel, Katia O. Karpova, Joshua House, Peter Lamb, Luciano Losekann, Alejandra Nuñez-Luna, Adilson de Oliveira, Jeff Rector, and Pei Yee Woo. PESD also collaborated with Anton Eberhard and Katharine Gratwick at the University of Cape Town who studied the IPP experience in Africa. The IPP study, although funded mainly by PESD, benefited from a seed grant from the Bechtel Initiative on Global Conflict and Cooperation through the Freeman-Spogli Institute for International Studies; we thank John Weyant and Bob Crow for their efforts to initiate the work on IPPs with the Bechtel funding.

Second, in parallel with this study PESD also collaborated with Prof. P.R. Shukla at the Indian Institute of Management (Ahmedabad) to examine the effects of power sector reform on technology choices in two Indian states. We thank the U.S. Agency for International Development for funding that study and for the continued support of the USAID team in Delhi: Richard Edwards, John Smith-Sreen, Sandeep Tandon, and Glenn Whaley. We are especially grateful to our collaborators Debashish Biswas, Tirthankar Nag, and Amee Yajnik. That study on two Indian states mirrored an earlier study, funded by the Electric Power Research Institute, that examined the effects of power sector reforms on electric technologies in three Chinese provinces, and we thank our colleague Michael May who co-led that effort and contributed in many ways to the present study.

Finally, and most importantly, we thank our collaborators and PESD's main funders. Our collaborators have been notably patient with our lengthy review and extensive editorial process. We have been blessed with generous and consistent programmatic support from the Electric Power Research Institute and BP, plc. We also thank the staff at PESD including Rose Kontak for overseeing and implementing the final stages in this undertaking – she has managed the production process and also played an instrumental role in the final rounds of editing. Others at PESD have also been exceptionally helpful, notably Becca Elias and Bob Sherman; we are also grateful to Josh House who helped oversee the project in its earlier stages. Our editors at Cambridge University Press, Chris Harrison and Lynn Dunlop, were a pleasure to work with throughout the publication process.

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