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978-0-521-33893-6 - Natural Monopoly Regulation: Principles and Practice

Sanford V. Berg and John Tschirhart

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NATURAL MONOPOLY REGULATION

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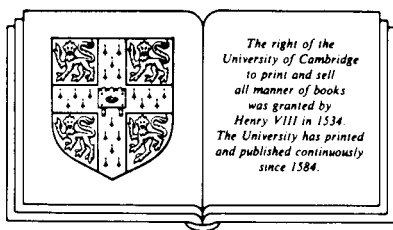
Principles and practice

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Preface

For nearly a quarter of a century, researchers have been responding to a series of path-breaking articles on the economics of public utilities. For example, Stigler and Friedland (1962) examined the effects of regulation on electricity prices, using data from the early 1900s. They found no impact on prices, and an outpouring of additional studies followed. Simultaneously, Averch and Johnson (1962) analyzed the impact of rate-base regulation on a firm's input mix and output. More elaborate models followed on the heels of their seminal contribution. At about the same time, Steiner (1957) and others were establishing the conditions for efficient pricing for a firm that experiences peak and off-peak demands for its output. The field of public utility economics no longer moved at a glacial pace, with case studies composing a substantial portion of its literature. Rather, it became part of the cutting edge of microeconomic theory, with more sophisticated analytical tools being applied to pricing and investment problems encountered in the context of natural monopolies.

Alfred E. Kahn's comprehensive textbook, *The Economics of Regulation* (1971), consolidated the extant literature, but the founding in 1970 of the *Bell Journal of Economics* contributed to the growth in the number of articles on utility topics. As an indication of that journal's impact, one need only note that this relative newcomer quickly became one of the top 10 economics jour-

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nals. The sustainability of natural monopoly, nonlinear pricing, and regulation under uncertainty are just three of the themes stressed in this literature that have enriched our understanding of complex regulatory issues.

Furthermore, the literature continues to expand. Besides the specialized and more general journals that publish research on public utility topics, there continue to be numerous symposia and conference volumes (such as those edited by Crew and by Danielsen and Kamerschen) that represent important sources of primary material. Keeping up with the burgeoning literature is nearly impossible; so the present survey represents a snapshot of a rapidly changing field of study.

We have tried to pull together the major strands of research, without merely creating an encyclopedic catalogue of the literature. Some themes are treated in an idiosyncratic manner, representing our own views of how the tapestry might be best displayed. We hope that researchers at regulatory commissions can sense the excitement of recent theoretical developments. In addition, we hope that academic analysts will gain an appreciation for the challenges faced by regulators and executives who grapple with problems in the transportation, electricity, gas, and telecommunications industries.

The bounds we have chosen for our coverage reflect both the need to produce a manageable manuscript and our own abilities and interests. Undoubtedly, our survey has missed some important contributions and in some chapters is biased toward our own work. The former is an error, and the latter a natural inclination.

Prerequisites

The reader is assumed to have a solid grasp of intermediate microeconomics. The material builds on standard consumer and producer theory; the particular applications to public utility issues involve extensions of intermediate theory. We have tried to avoid mathematical elegance for its own sake. However, partial differentiation is used extensively in the context of con-

strained optimization problems. Similarly, integration is used when deriving consumer surplus and expressing expected values.

Despite the regular appearance of functional notation, the non-mathematical reader will be able to follow the chains of reasoning. The extensive use of figures should assist in the interpretation of key relationships. We have tried to make the material accessible to the technical staffs of regulatory commissions and utilities, but the target audiences are advanced undergraduate and graduate students, in addition to economists wishing to review recent developments in the field.

Acknowledgments

Any collaboration is a complicated activity. The authors brought different backgrounds and experiences to the enterprise, but the joint work required covering a broad and complicated set of topics. Each author has been surprised and delighted at how various (seemingly dissimilar) concepts have fitted together at times. Each has also despaired at the scope of the themes that, by necessity, have had to be explored. Fortunately, it seems that our moods and our research interests were complementary – enabling balance both in the analytics and in our spirits as the project progressed.

We have benefited greatly from feedback provided by our colleagues and students. We gratefully acknowledge helpful comments on particular sections by Eugene Brigham, Doug Gegax, Jon Hamilton, Douglas N. Jones, John Panzar, Richard Romano, David Sappington, Roger Sherman, H. Sourbis, Steven Slutsky, Linda Stanley, Ingo Vogelsang, and the anonymous reviewers of an earlier draft. Among former students at the universities of Florida and Wyoming we would like to thank Sarmila Banerjee, Charles Bennett, Richard Cabe, Lisa Crone, Louis Gapenski, Martin Grace, Marcie Guira, Cliff Nowell, and Tejaswi Raparla. Colin Day, our editor, provided encouragement and support throughout the project.

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ida has provided time and typing support, allowing us to complete needed revisions. Utility executives and regulators have also influenced our work by asking us fundamental questions regarding the nature of regulation of natural monopolies. In an era of change, decision-makers are going to expect academic researchers to contribute to the policy debate. These contributions will require that key concepts be closely linked to their empirical counterparts. Because of data limitations and the fact that disruptions would arise from premature applications of new theories, significant developments in microeconomic theory over the past two decades are only beginning to have an impact on policy. This book provides a comprehensive overview of natural monopoly issues that we hope will stimulate analytical refinements and lead to improved public policies.

S. V. B.

J. T.