



Contents lists available at ScienceDirect

Explorations in Economic History

journal homepage: www.elsevier.com/locate/eeh

Ownership and the price of residential electricity: Evidence from the United States, 1935–1940[☆]



Carl T. Kitchens^a, Taylor Jaworski^{b,*}

^a Florida State University, Department of Economics, United States

^b Queen's University, Department of Economics, Canada

ARTICLE INFO

Keywords:

Electricity
Ownership
Regulation

ABSTRACT

In this paper, we quantify the difference between public and private prices of residential electricity immediately before and after major federal reforms in the 1930s and 1940s. Previous research found that public prices were lower in a sample of large, urban markets. Based on new data covering over 15,000 markets and nearly all electricity generated for residential consumption, we find that the difference between public and private prices was small in 1935 and negligible in 1940 for typical levels of monthly consumption. These findings are consistent with a market for ownership that helped to discipline electricity prices during this period. That is, private rents were mitigated by the threat that municipalities would use public ownership to respond to constituent complaints and public rents were limited by electoral competition and the growth of private provision.

1. Introduction

Private utilities account for the vast majority of electricity sales in the United States today. Nevertheless, publicly-owned utilities still substantially outnumber privately-owned utilities. This highlights the ability of policymakers to choose between public or private provision, which may impact the welfare of final consumers due to different incentives for extending service and price setting. For example, public utilities may respond to political pressure to extend service to important constituencies or use pricing to increase reelection chances (Peltzman, 1971).¹ Alternatively, profit-maximizing private utilities with exclusive territories may use monopoly pricing in the absence of regulation (Joskow and Schmalensee, 1986) or market segmentation and quantity discounts to price discriminate (Peltzman, 1971). Access to private ownership may have implications for the quality of service, technology adoption, and pricing (Rose and

Joskow, 1990; Joskow, 1997).

Widespread federal regulation of the US electricity industry first began as part of the New Deal during the 1930s, inspired by the perception that private, investor-owned utilities used monopoly pricing, limited access, and evaded regulation at the state level. This paper contributes to the literature on role of ownership in determining retail electricity prices by examining the period immediately before and after reforms implemented under Franklin Delano Roosevelt. Earlier work on this period found that public utilities serving large urban markets tended to have lower prices than private utilities (Emmons, 1997). However, this work relied on a sample of urban markets and limited information on prices. We use newly digitized data from Federal Power Commission reports to revisit the evidence for these claims and understand the relationship between ownership and prices faced by residential consumers. In particular, our data cover 99% of retail electricity for over 15,000 markets

[☆] For helpful comments we thank Ann Carlos, Rob Clark, Karen Clay, Briggs Depew, Price Fishback, Gary Fournier, Theresa Gutberlet, Mark Isaac, Ian Keay, Erik Kimbrough, Frank Lewis, Josh Lewis, John Neufeld, Mario Samano, Edson Severnini, Vernon Smith, and Werner Troesken. The paper also benefited from feedback at the AEA-Cliometrics, Canadian Network for Economic History, Colgate University, Colorado-Boulder, and HEC Montreal. All remaining errors are our own.

* Corresponding author.

E-mail addresses: ckitchens@fsu.edu (C.T. Kitchens), tjaworski@gmail.com (T. Jaworski).

¹ Baskaran et al. (2012) and Min and Golden (2014) provide relevant evidence on politics and pricing for modern-day India.

in 1935 and 1940.² These comprehensive data allow us to include geographic controls for differences in cost and demand at the local level, which were absent from previous studies.³

In 1935, we find that public utilities charged lower prices than private utilities when monthly consumption was below 100 kilowatt hours (kWh), while private utilities tended to provide large quantity discounts. Specifically, at 15 monthly kWh, the price per kWh of public utilities was 6.7% lower than private utilities. The public–private price difference decreases to 5.7% at 25 kWh per month, 2.3% at 40 kWh, and disappears at 100 kWh. At 250 and 500 kWh per month the pattern reverses and public prices are 11.5 and 28.1% *higher*, respectively.⁴ We also use data for 1940 to confirm that five years later price differences between public and private utilities were smaller, which suggests that the similarity between public and private in the mid-1930s was not an artifact of the Great Depression.

These findings suggest that the threat of switching ownership types was an important feature disciplining electricity prices prior to the implementation of New Deal reforms. On the one hand, private monopoly rents were limited by the potential that local municipalities would take over ownership in the face of constituent complaints. While on the other hand, public rents were mitigated through electoral competition or increased demand for private provision. Ultimately, the prices faced by customers under the two types of ownership were similar.

Importantly, competition through ownership was only possible when technology relaxed the natural monopoly constraints on the industry and regulation maintained flexibility in organizational form. In particular, increased generation capacity and the expansion of the transmission grid that started in the late nineteenth century were central to the emergence of an active market for ownership during this period. This enabled private utilities to replace the substantial investment in local generation capacity, which could be coopted by opportunistic local politicians, with smaller investments to connect the town or city via the transmission grid (Neufeld, 2015).⁵ In addition, during this period regulation moved from the local to the state level, which lowered borrowing and regulatory costs (Hausman and Neufeld, 2002; Knittel, 2006). Thus, communities that would have initially only obtained access through public provision were able to attract private ownership.

Policymakers today are faced with restructuring to address improvements in technology (e.g., Wald, 2014), growing concerns about the impact of climate change (e.g., Cardwell, 2013), and increasing demand (e.g., *The Economist*, 2016). During the growth of the early electricity industry in the United States, both public and private utilities played a role in helping to expand access, pass on the gains from new technology (e.g., lower prices, reduced intermittency), and satisfy other customer demands (e.g., reduce corruption). Our results show that the dual role of public and private utilities in this process did not lead to substantial differences in prices faced by residential consumers. Our findings also suggest important benefits from

maintaining contractual flexibility.

2. Growth of the early electricity industry³

The retail electric light industry was created in 1881 with the lighting of J.P. Morgan's home and the completion of Thomas Edison's Pearl Street Station in the following year. The Pearl Street station generated direct current electricity at a central plant in New York City, which was then distributed to homes and businesses near the plant. At first, delivery was limited to homes within approximately one mile of the central station. Between 1881 and 1900 the number of central service stations increased from 8 to over 3000.

Soon after the formation of the Edison–Morgan partnership a former Edison engineer Nikola Tesla, backed by George Westinghouse, developed the polyphase alternating current motor. Alternating current, due to its higher voltage, enabled delivery over much longer distances. Competition between direct and alternating current continued throughout the 1880s. In 1893, Westinghouse was awarded contracts to supply the Chicago World's Fair and setup generators on Niagara Falls to supply electricity to Buffalo. This cemented alternating current as the industry standard.

In subsequent decades, investment and revenue increased dramatically: roughly fifty-fold in each case (*US Census Bureau, 1932*). This was accompanied by the development of conductive materials and technologies, particularly related to high voltage transmission over large distances. For example, in 1922 California's Pacific Gas and Electric constructed the first 220 kV transmission line from Pit River in the Sierra-Nevada Mountains to the San Francisco Bay Area. The increase in voltage allowed a fourfold increase in power to the city and was transmitted over 200 miles with minimal load losses (*Pacific Service Magazine, 1922*, p. 345). Innovations such as these led to significant changes in industry structure throughout the 1920s (Schap, 1986).

Contemporary accounts highlight the relationship between ownership and growth of economies of scale in generation and the expansion of high voltage transmission lines. For example, Dorau (1930) writes,

The new technology of the electric light and power industry, embodied principally in the system of large-scale, centralized production of electricity, with broadened market reached by high tension long-distance transmission lines and with interconnection of these central supply stations, appears to have been the most important condition affecting the character and extent of municipal ownership of electric establishments.

These improvements provided incentives for once isolated utilities to take advantage of efficiencies through joint operation, technical planning, siting, and smoothing of peak load requirements. Savvy entrepreneurs took this opportunity to consolidate operations. For instance, Thomas Martin, head of the Alabama Power Company, worked to create a geographically integrated system in the Alabama and in the Southeast more broadly. By 1927, Alabama Power had consolidated the fragmented holding in Alabama (*Federal Trade Commission, 1931*). In 1929, Martin consolidated the operations of the Alabama Power Company, Georgia Power Company, Gulf Power Company, South Carolina Power, and Mississippi Power to form Southeastern Power and Light, which covered 140,000 square miles (Taft and Heys, 2011).

This type of consolidation provided immediate benefits by altering the generation mix to run the most efficient plants at capacity and only older, less efficient plants at times of peak demand. The integrated system also made it possible to delay

² Markets range in size from small communities with at least 250 residents to large urban centers.

³ For example, we control for county fixed effects as well as market level variables such as distance to the transmission grid, distance to generation facilities, and generation mix.

⁴ In 1935, between 15 and 40kWh per month was enough electricity for lighting and smaller appliances, up to 150kWh was enough to add refrigeration, 250kWh included cooking, and 500kWh allowed for the hot water heating (*Federal Power Commission, 1935*).

⁵ For example, with utilities for gas and water Troesken (1997), Troesken and Geddes (2003), and Troesken (2006) discuss the benefits of ameliorating local corruption by removing regulation to the state level.

Download English Version:

<https://daneshyari.com/en/article/5068638>

Download Persian Version:

<https://daneshyari.com/article/5068638>

[Daneshyari.com](https://daneshyari.com)