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Electricity markets in transition: Market distortions associated with retail price controls

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ABSTRACT

In many jurisdictions, there are growing concerns over rising electricity prices and increased price volatility due in part to aging network infrastructure, retiring generation capacity, and subsidies to promote investment in renewables. In response, policymakers have advocated for or implemented retail price controls. Yet these can foster distortions that do not directly address market failures. We discuss alternative policies that can be used to mitigate these price effects.

1. Introduction

Electricity markets are in a period of transition worldwide. Growing concerns over climate change, technological advancements, and subsidies have led to an increased penetration of renewable generation and distributed energy resources such as rooftop solar and energy efficiency. Further, numerous jurisdictions have adopted policies to place a price on carbon emissions (Gulli and Chernyavska, 2013). These market changes have been coupled with the need for capacity investments to replace aging generation units and modernize the transmission and distribution network infrastructure (IEA, 2014). These market dynamics place upward pressure on electricity prices and increase policymakers' concerns over price volatility.

Recently, multiple jurisdictions have implemented retail price controls in an attempt to protect consumers from rising electricity rates and a potential increase in price volatility. While retail price caps and freezes have been implemented in the past, these price controls were largely motivated by the lack of competition as market-based (restructured) electricity markets were being implemented (Kwoka, 2008). Retail price controls that hold retail rates at inefficiently low levels can dampen price signals, distort retail market competition, damage utility finances, result in government budget deficits, and lead to contentious debates and retail price spikes as governments attempt to phase out the imposed price controls.

In this article, we discuss the market distortions and other issues that can arise in the presence of retail price controls that artificially hold rates at suboptimal levels. We begin by supposing that retail markets are competitive or regulated and the natural monopoly portions of the industry pass their costs through at regulated rates. This allows us to focus on the distortions associated with retail price controls not designed to solve a clear market failure. Because the competitiveness of retail markets is central to an understanding of the effects of retail price controls, we also consider the evidence on this question, and discuss how our conclusions regarding the effect of price controls and alternative policy approaches would be changed by a significant degree of retail market power.

We begin in Section 2 by providing an overview of retail price controls used in numerous jurisdictions. In Section 3 we provide details of the electricity market in Canada's Alberta province, highlight several recent changes to the market design, and discuss the recently proposed retail price cap. Section 4 discusses the market distortions and political challenges associated with imposing retail price caps in the presence of rising industry costs. We propose alternative policies in Section 5. Section 6 concludes.

2. Retail price controls

During electricity market restructuring in the United States, several states implemented retail rate controls in the form of an initial rate reduction of 3%–20% and a subsequent rate freeze. These price controls persisted for up to 10 years and were motivated by concerns of market power in the wholesale and retail sectors during the transition period (Kwoka, 2008). An unexpected increase in natural gas prices caused these retail rates to be substantially below the equilibrium level. This created financial problems for utilities and is cited as a contributor to the 2000–01 California electricity crisis (CBO, 2001).

Several jurisdictions have recently imposed similar retail price controls. However, the cited motivation for these price controls is not

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over concerns of market power execution, but to shield consumers from rising electricity prices and concerns over price volatility. These price controls often occur in combination with policies to promote network upgrades, grid modernization, and subsidies to renewable and distributed energy resources. As a result, these price controls are occurring during a period of rising industry costs.

As a recent example, in December 2016 the Illinois Senate passed "The Future Energy Jobs Bill" that includes numerous provisions to fund investment in renewables and distributed energy resources and provide subsidies to six large nuclear facilities (Illinois General Assembly, 2016). In addition, the bill calls for limitations on the rate of increase in retail prices and overall rate caps on residential, commercial, and industrial consumers. These price controls are in place until 2030.

Similarly, in November 2016, the Alberta government announced a ceiling on the energy portion of the retail electricity price for residential consumers, limiting retail prices to not exceed 6.8 cents per kWh (Alberta Government, 2016). The rate cap is to be in place until June 2021. The rate cap does not apply to per-site service or administrative fees. While current rates are below the proposed cap, it is markedly below the historical average retail rates in Alberta. As we discuss in detail below, this retail price control arises during a period of substantial transition in Alberta's electricity market.

Other recent examples of controversial retail price controls are in Spain and Australia. The Spanish electricity market has imposed retail price controls since the early 2000s, leading to subsidized electricity consumption and a considerable energy tariff deficit (Federico and Vives, 2008). In the presence of increasing industry costs due in part to the need to meet rising peak demand, regulators in Queensland Australia imposed retail price controls that limited rates to be below estimates of long-run marginal cost. This led to concerns over the feasibility of retail competition and the need for government intervention to ensure reliability in the presence of suboptimal rates (Simshauser and Laochumnanvanit, 2012).

3. Alberta's electricity market and retail price caps

While our discussion of price controls applies generally to restructured electricity markets worldwide, we focus on the implementation of price controls in Alberta to emphasize the potential market distortions of retail price controls. In Alberta, electricity market restructuring began in 1996 and retail and wholesale market competition was established in 2001. Transmission and distribution remain as regulated natural monopolies (Olmstead and Ayres, 2014). Alberta's wholesale market currently operates as an energy-only market design with a uniform price (i.e., there is no nodal pricing). While there are no formal bid mitigation measures to limit wholesale market power and the generation side of the market remains moderately concentrated (Brown and Olmstead, 2017), wholesale power prices are currently at historic lows due in part to low natural gas prices and excess generation capacity (MSA, 2016).

Alberta's generation capacity is primarily fossil-fuel-based, with 39% and 43% of installed capacity being fueled by coal and natural gas, respectively. Import capacity is limited, with interties from neighboring regions having maximum available transfer capabilities of only 1103 MW combined, compared to an average market demand of 9162 MWs in 2015 (AUC, 2016).

3.1. Alberta retail competition

In Alberta and numerous jurisdictions, electricity market restructuring opened the retail market up to competition. Under retail competition, electricity is produced by deregulated generators and flows through regulated transmission and distribution lines to the final consumer. Retailers do not at any point take physical possession of the product. A competitive retailer offers consumers a variety of contracts, varying largely by the price structure (floating or fixed) and duration. To a large extent, retailers can be viewed as offering different packages of insurance against wholesale electricity price variation. In addition, retailers offer "green" products and dual fuel electricity/natural gas combined products. Finally, retailers provide customer care and billing services.

In addition to the introduction of retail competition, Alberta chose to maintain a regulated default product (the Regulated Rate Option (RRO)), to be available to all customers with annual consumption below 250 MWh (MSA, 2015). The RRO is provided in different regions of the province by different firms, with most of the RRO contracts being served by three providers. The energy-based portion of RRO rates is set on a monthly basis and regulated by the Alberta Utility Commission. Under the RRO Regulation, these rates must be based on forward electricity prices over a short period (initially 45 days, then extended to 120 days) before the month of delivery (MSA, 2014). The RRO Regulation indicates that the regulated rate of the RRO "must not impede the development of an efficient market for electricity based on fair and open competition …" (Alberta Regulated Rate Option Regulation, 2005, Paragraph 6(1)(d)).

The regulated default rates were expected to be temporary until retail competition was sufficiently developed. However, the RRO was never phased out and remains an option for small consumers (Retail Market Review Committee, 2012). Transition of customers from the RRO to competitive products has been gradual. By June 2016, 45% of residential customers were on a competitive contract (compared to 27% of farms and 57% of small commercial and industrial customers). Almost all customers on a competitive contract are with one of the three largest competitive retailers (MSA, 2015). The majority of customers on competitive rates are on long-term fixed prices ranging from one to five years. MSA (2015) reports that as of the end of 2014, 64% of customers on competitive contracts were on dual-fuel (electricity and natural gas) contracts with long-term fixed electricity rates, with additional consumers on fixed-rate energy-only contracts.

McFetridge (2012) and MSA (2014) assessed the competitiveness of Alberta's retail market. The conclusion of the MSA (2014) was that the retail market is competitive. McFetridge (2012) notes on page 35: "the retail electricity market can be regarded at present as being competitive if not highly competitive. The RRO plays an important role in this. Competitive retailers design their offerings with a view to matching if not beating the RRO." He goes on to note that "it is reasonable to assume that there would be significant new retail entry in the event that the RRO is eliminated." The close interaction between the RRO and competitive retailers' products will play an important role in assessing the impact of retail price caps discussed below.

3.2. Recent changes to policy and market structure

In the past two years, Alberta's electricity market has undergone substantial changes with the intent to transition the power market away from coal generation towards more renewable integration. The government adopted a carbon pricing program that substantially increases the cost of production from coal generation, imposed a mandatory coal unit phase-out by 2030, and announced the implementation of a program to procure utility-scale renewable projects (Alberta Government, 2015; AESO, 2016a; Brown et al., 2017). Further, the government announced its intent to transition the market from an energy-only market design to one that includes a capacity payment mechanism (AESO, 2016b).

The government implemented changes to the retail market as well. In addition to a ban on door-to-door sales, on Nov. 22, 2016, the government announced the introduction of a retail price ceiling of 6.8 cents per kWh that will apply to the RRO rate until 2021. The motivation for the retail rate cap is the anticipation of higher electricity prices and to protect consumers from "volatile" electricity prices (Alberta Government, 2016). This ceiling is 15% below the average RRO price