



Liberalization of a retail electricity market: Consumer satisfaction and household switching behavior in Japan[☆]



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ABSTRACT

Policy makers pursue open markets through deregulatory reform based on a belief that they increase economic efficiency and produce benefits for consumers mainly through price reductions. However, the superiority of competition over regulated monopolies is not established. In a liberalized market, consumers exercising their ability to choose a utility provider is a crucial way of shaping the outcomes of deregulatory reform. While achieving a high switching rate is not the ultimate goal of market reform, it is an important tool through which consumers gain from policy form. We use data from a Japanese household survey conducted before and after recent liberalization and find a positive impact of liberalization on consumer satisfaction by enabling consumers to choose an electricity provider. This result indicates that switching can be utility improving by increasing customer satisfaction and underlines the importance of switching behavior in effectively utilizing deregulatory reform. This study also examines a broad set of determinants of provider switching and discusses the policy implications of the empirical results.

1. Introduction

The electricity sector has traditionally been one of the largest utility markets (Dyner and Larsen, 2001). The electricity market is a *key network industry*¹ in which scale economies can render production by many firms uneconomic. Given the nature of natural monopoly, public utilities are vertically integrated, often state-owned, monopolies in many countries (Newbery, 2002). Despite concerns and fears of failure, policy makers have pursued reforms in key network energy industries.² Newbery (2002) noted, “policy makers deregulate with the belief that market forces produce a better allocation of resources and greater effectiveness in the supply of services, and the free movement of goods, persons, services and capital should be extended to these public utilities.” Similarly, Al-Sunaidy and Green (2006) claimed, “a large number of policymakers in the OECD consider deregulation to be the best hope for achieving the dual goals of economic efficiency and security of supply.”

The common aim of deregulation is to bring about competition among providers in order to increase the efficiency of the market and to reduce retail prices, as well as to stimulate technological innovation (Asano, 2006; Gamble et al., 2009). The liberalization of the energy

market has ignited restructuring and competition that have led to modest efficiency gains in production and distribution, but there seems to be a lack of clearly visible direct benefits to households in many countries (Pollitt, 2012).

Deregulation is often accompanied by skepticism about the superiority of competition over regulated monopolies. Moreover, the process of liberalization is complex, and we know relatively little about optimal liberalization policies (Armstrong and Sappington, 2006). Deregulation does not always guarantee benefits for consumers but creates new supply and price uncertainty that did not exist in monopolies or monopolistic market (Dyner and Larsen, 2001). The infamous Californian electricity crisis of 2001 in which consumers were greatly affected by an inadequate electricity supply raised concerns regarding failed regulatory design and the legal framework for the liberalization process (Newbery, 2002). In addition, there are cases of deregulation that have increased the price of electricity; recently, Vihalemm and Keller (2016) reported a significant rise in prices following the liberalization of the electricity market in Estonia in 2012–2013. Furthermore, the benefits of deregulatory reforms are very difficult to measure (Borenstein and Bushnell, 2000). Increases in efficiency and fluctuations in prices depend on multiple factors in addition to the policy, and

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¹ Other examples of key network industries include telecommunication, natural gas, transport and water.

² For an extensive list of deregulation reforms, see the Introduction of Nakajima and Hamori (2010).

often, the impacts are difficult to separate.

This study contributes to existing empirical work on the deregulation of key network industries by analyzing original Japanese household survey data collected before and after the recent liberalization of the retail electricity market. First, we compare the changes in the reported satisfaction ratings of consumers who switched providers since liberalization and those who remained with the incumbent provider to examine whether provider switching could be utility improving. We find supportive evidence of a positive impact of deregulatory policy reform enabling consumers to choose their providers. Given this result, which underlines the importance switching behavior and validates further discussion of how to improve and maintain provider switching by consumers, we examine a broad set of determinants of provider switching behavior and discuss the policy implications of the empirical results.

The rest of this paper is organized as follows. Section 2 provides a brief description of the liberalization of electricity markets around the world and in Japan. Section 3 discusses switching behavior in liberalized retail electricity markets based on previous empirical studies. Section 4 describes the Japanese household survey data. Section 5 analyzes the impact of switching on consumer satisfaction. Section 6 provides the results on the determinants of switching. Section 7 discusses the results and policy implications. Section 8 concludes.

2. Liberalization of electricity markets

The liberalization of electricity markets began in the 1990s. New Zealand and Sweden fully deregulated their markets in 1994 and 1996, respectively. Most advanced European economies followed: Germany enacted reforms in 1998; the United Kingdom, in 1999. The other Scandinavian countries had open markets by the early 2000s. Retail markets in France, Belgium, Greece and Poland were fully deregulated by 2007. Almost every state in the U.S. had considered the possibility of electricity deregulation by the late 1990s, and some states enacted reforms to induce retail competition through deregulation. On the other hand, public utility markets remain relatively heavily regulated in most Asian countries. South Korea liberalized its retail electricity market in 2001, but the providers remain heavily subsidized. Japan did not fully liberalize its retail market until 2016.

Despite the benefits of open markets, the success of deregulatory reforms has varied. The liberalization of the United Kingdom and Ireland's retail electricity markets have been regarded as success stories, and their switching rates across household providers are higher than those of other EU countries. Moreover, these liberalized markets have improved customer satisfaction (Ariu and Goto, 2014). On the other hand, California's 1996 electricity deregulation was a widely known disaster, which led to the reconsideration of deregulation policies by several states. In the summer of 2000, a price hike and an insufficient supply due to adverse weather conditions led to one of the largest electricity supply disasters in the recent U.S. history. Given the well-functioning markets of the Pennsylvania, New Jersey, and Maryland Interconnection, varied regulatory frameworks and market circumstances influence the evolution of wholesale and retail competition post reform (Joskow, 2000).³

Following the trend of reform in the U.S. and Europe, Japan has pursued gradual deregulation of its electricity industry. Japan had relatively high average electricity prices per kWh (See Table 1 in Hosoe (2006)), and its liberalization process has lagged behind other advanced economies.⁴ Japan's deregulation process began in 1951, and

³ Joskow (2000) provided detailed descriptions of early experiences with retail competition in California, Massachusetts, and Pennsylvania and gave an initial assessment of the benefits and costs of electricity sector restructuring in the U.S.

⁴ Newbery (2002) discussed the problems with liberalizing electricity markets, particularly in European countries. Al-Sunaidy and Green (2006) provides extensive overview of OECD deregulation of energy markets, with a focus on the U.S.

competitive bidding for new generating capacity has been in place since 1996, along with the deregulation of market entry into the sector for independent power producers (IPPs) with thermal plants Asano (2006). Japan's retail markets for industrial consumers with contract power over 2MW and consumers with contract power over 50 kW were liberalized in 2000 and 2005, respectively. Alongside electricity, the gas industry has also experienced gradual deregulation; studies have shown that the liberalization of energy utilities has improved productivity growth in Japan (Asano, 2006; Nakano and Managi, 2008).

Previously, Japanese residential consumers purchased electricity from ten⁵ vertically integrated regional monopoly providers. With full liberalization of the retail electricity market in April 2016, customers with contract power of less than 50 kW, who account for almost 40% of total power consumption in Japan, became eligible able to choose their electricity providers (Agency for Natural Resource and Energy, 2015).

According to the latest report from the Agency for Natural Resource and Energy (2016), there are over 360 registered retail electricity businesses, and approximately 60% of these businesses operate in limited geographical area, mostly in the Tokyo metropolitan area. The rate of new registrations has been slowing since the reform was enacted. Nevertheless, with the exception of consumers in Okinawa prefecture and the other areas without new entrants, most Japanese household consumers can select from more than one electricity provider.

3. Literature review

This section discusses provider switching, which is a major tool that consumers can use to improve their consumption experience. First, we discuss provider switching as a measure of policy evaluation. Second, we describe the switching rates in various energy utility markets. Third, we review previous studies that have examined the determinants of switching behavior and discuss what we should expect to observe in our analysis of the liberalized Japanese retail electricity market.

3.1. Significance of provider switching

While a high provider switching rate is not the ultimate goal of market reform, it is one of the major tools that allows consumers to gain from policy reform. Gamble et al. (2009) noted, “consumers failing to switch provider that would be beneficial to them jeopardize the efficiency of deregulated markets”. Yang (2014) also stated that from an energy policy perspective, the rate of provider switching is an important indicator of the success of market deregulation, and the rate acts as an indicator of consumer participation in the liberalized retail market. High switching rates can be interpreted as a sign of competition in the market and/or as a sign of the incumbent's inability to adapt to the new competitive environment (Al-Sunaidy and Green, 2006). In a market where provider switching is difficult, incumbents can keep consumers despite relatively high prices. Nevertheless, Ariu and Goto (2014) indicated that even if consumers do not actually change providers, the expectation of switching behavior on its own can lead to substantial competition among providers to provide consumer-friendly products. For deregulatory policy to have an effect through consumer actions, it is important for consumers to be informed of their new ability to shape the market and to be incentivized to choose the provider that offers the services that most closely match their preferences.

3.2. Provider switching

The British reform of the electricity market in 1994/1995 is considered an example of successful liberalization. By June 1999, the

⁵ Hokkaido, Tohoku, Tokyo, Chubu, Hokuriku, Kansai, Chugoku, Shikoku, Kyushu, and Okinawa.

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