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Market power and heterogeneous pass-through in German electricity retail☆

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ABSTRACT

We analyze the pass-through of cost changes to retail tariffs in the German electricity market over the 2007–2014 period. We find an average pass-through rate of around 60%. This significantly varies with demand factors: while the pass-through rate to baseline tariffs, where firms have greater market power because customers are less willing to switch, is only 50%, it increases to 70% in the competitive segment of the market. Although the pass-through rate of independent firms is significantly higher than that of other firms in the competitive market segment, the extent of supply-side heterogeneity is limited. Thus, the firms' ability to exercise market power and reduce pass-through appears to be constrained by competition and largely determined by demand side factors. Finally, we find that the pass-through rate in the competitive market segment has been approaching unity over the past years, indicating a rise in competitive pressure.

1. Introduction

Oil and gas prices have been fluctuating over the past two decades, but started declining in the 2010s. At the beginning of 2016 they reached their lowest value since 2003. Wholesale energy prices followed a similar pattern in most European economies as well as the US and, after a surge in the mid-2000s, are now at the level of the late 1990s. Yet, electricity retail prices do not seem to have responded to these cost changes. Notwithstanding a decade of liberalization and deregulation, as well as steadily increasing competitive pressure, European retail tariffs have increased rapidly since 2000. In a 2014 report, the European Commission finds that energy retail prices have increased by 4% annually across all member states in the

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2008–2012 period,[1] and that the average increase in electricity retail prices between 2008 and 2013 amounts to 28%.[2] Over the same time period, German retail prices increased on average by 36%, while network charges increased by only 17%, and wholesale energy prices dropped by 27%.[3]

Understanding the extent to which cost changes are transmitted to retail prices for final consumers – the pass-through – is imperative for policy makers; particularly in markets that are the focus of public opinion, such as energy retail. Commentators regularly report that the cost savings in wholesale markets are not passed on to consumers and that the pass-through rate is very low.[4] While several potential explanations are put forward in the theoretical literature on the sources (and lack) of pass-through, empirical evidence to answer these questions, especially in the context of electricity markets, remains scarce. From a broader and more fundamental perspective, the literature stresses the need to better understand the underlying economic mechanisms that explain the degree of pass-through, which is – as pointed out by Weyl and Fabinger (2013) – a 'sufficient statistic' for welfare analysis. Thus, estimating pass-through and its dimensions of heterogeneity permits making inferences on structural parameters, which are normally unobservable and difficult to estimate, such as elasticities and the extent of market power. These are key to understanding the functioning of imperfectly competitive markets and are, therefore, useful for counterfactual analysis and the guidance of policy interventions (e.g. Miller et al., 2017, 2015).

This paper provides an empirical analysis of cost pass-through in the German retail market for electricity. Based on a detailed dataset of monthly electricity tariffs for different consumption bundles at the postal code level over the 2007 to 2014 period, we study how changes in main cost drivers – such as network charges, licence fees, and wholesale electricity prices–are transmitted to retail tariffs. We find that the average pass-through is incomplete at around 60%. However, there are some dimensions of heterogeneity. The pass-through rate is lower in market segments where customers face higher switching costs. Baseline tariffs–the tariffs that households automatically get if they are not willing or able to switch retailers–respond less to cost shocks than the least expensive tariffs available, i.e. the competitive segment of the market. However, even in the competitive market segment pass-through is not complete. This might be due to long term supply contracts and some degree of market power by regional retailers.

We also find that the pass-through rate does not strongly depend on the identity of retailers. We contrast large vertically integrated firms, municipal utilities, firms with a mixed ownership structure, and small independent retailers. The independent firms, which we assume to be most competitive, exhibit 15–20% higher pass-through rates in the competitive market segment; the pass-through rates to baseline tariffs do not significantly differ across firms. This indicates that the ability to exercise market power is predominantly determined by demand side factors (consumer search and switching behavior) rather than by supply side factors (scale and vertical integration of retailers).

Moreover, we find a significant degree of time variation in pass-through rates. While pass-through to baseline tariffs remains relatively stable, pass-through to competitive tariffs is relatively low at the beginning of the sample period and increases to almost unity in the 2012–2014 period. It therefore seems that competitive pressure is increasing in the more competitive market segment.

We focus on the retail electricity market in Germany for several reasons. First, retail energy markets, such as electricity and gas, have been in the spotlight in all major developed countries during the last decades, especially in Europe. Yet, in contrast to sectors like telecommunications, the liberalization, privatization, restructuring, and deregulation of energy markets spurred by EU Commission directive do not appear to have been fully successful.[5] While almost all European countries have reached the stated objective of fully liberalized retail markets and entry has occurred on a large scale, direct benefits to consumers in terms of lower prices and better services do not seem to have fully materialized (e.g., Joskow, 2008; Su, 2015; Waddams Price, 2005).

A second reason to focus on the German retail electricity market is data availability and reach. We are able to match several sources, ultimately creating a rich data-set with precise and high frequency (monthly data for eight years) postal code level information on retail tariffs as well as network charges. Moreover, we have data on wholesale electricity prices from the European Energy Exchange (EEX) – the leading centralized market for electricity located in Germany. These data are not easily available for other countries.

A further advantage of focusing on electricity retail markets is that network charges and wholesale electricity prices account for more than 2/3 of the cost of electricity, while the remaining third comprises mostly taxes and fees (especially renewable surcharges), which can easily be captured by fixed effects. Moreover, most of these cost drivers can be considered to be exogenous to the retailers' pricing decisions. Therefore, we believe we are able to provide unbiased estimates of pass-through rates because we capture a substantial fraction of overall variable costs and can control for most of the unobserved ones.

Finally, electricity markets exhibit a large degree of heterogeneity in market structure both on the supply and on the demand side, which we exploit econometrically. On the supply side, we observe firms of different sizes and ownership structures, pursuing different objectives. On the demand side, consumers differ with respect to their consumption patterns

[1] Energy prices and costs report, SWD(2014) 20 final/2.

[2] http://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_price_statistics.

[3] Calculated from Verivox, ene't and EEX data, see Section 4.

[4] See, for example, *The Economist*, 'Switched Off', February 13, 2016.

[5] See Directive 96/92/EC.