



Contracting in a market with differential information

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Marta Rocha and Thomas Greve

The recent advanced infrastructures in the energy sector based on smart meters are now capable of real lifetime pricing and remote reading. Smart meters will allow, for example, individual customers using software in order to optimize their use of devices in smart houses while interacting with the grid. For the interest of this paper, this new generation of meters will allow for better customer information, that is, data with a higher frequency and better quality of billing data.

This has generated a debate in relation to the potential sensitivity of data on customers' energy usage that firms will be able to hold once smart meters are fully installed. Indeed, the major players in the energy markets, such as network providers, suppliers, regulators and customers, recognise the potential sensitivity of data on customers' energy usage. Questions about who will secure the data on customers' energy usage and who will secure the information flows have already been made. The Council of European Energy Regulators has already made recommendations over potential discriminatory behaviour and potential measures of data security (CEER 2015).

This potential discriminatory behavior can come from a vertical connection between the distribution operator (upstream firm) and a retailer firm (downstream firm). This connection can particularly exist if the downstream firm was previously an integrated part of the upstream firm. Then, if the upstream firm has access to all customers' information in the market, there might be incentives for the upstream firm to give access to better data to its affiliated rather than to the remaining downstream

firms in the market. Nevertheless, it is still unclear what impact this new degree of information on competition in the energy markets is.

The key question posed by this paper is whether a firm with better information about the customers consumption profile in the market than their rivals can use that information to earn greater profit. Although it might seem intuitive, one cannot make the general claim that access to better information leads to higher profits. We develop a simple framework of only two firms, which have access to the same technology and where customers have fixed demand, and supply a good composed of many commodities that compete in prices.

We show that, under no differential information, both firms equally share the customers and types of customers, charge the same payments and obtain zero profits. Under differential information, we assume that access to better information allows the better informed firm to attract specific customers. Access to better information gives the better informed firm a first customer contact advantage. The uninformed firm can only offer a menu of price vectors without being able to pre-identify the types of customers.

Consequently, access to better information leads to a change in the tie-breaking rule. The same result would hold if, for another reason other than better information, one firm would have first customer contact advantage. Nonetheless, the uninformed firm can access the market, preventing the better informed firm from making positive profits. We find that better information does not give a firm an advantage or disadvantage, that is, the better informed firm obtains the same equilibrium profit as the uninformed one. We also show that there is no information value because the better informed firm has the same equilibrium profit under both cases.

The paper concludes with a discussion of how the main insights from the analysis are likely robust to changes in the number of (i) customers, (ii) firms, and (iii) types of customers. Future research could be to consider the impact on the results of some type of demand-side management where customers could shift their own demand for electricity during peak periods in order to reduce their energy consumption overall.

Contact	martaproenca@gmail.com
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