

The Efficiency and Distributional Effects of Alternative Residential Electricity Rate Designs

By Burger, Knittel, Perrez-Arriaga, Schneider and vom Scheidt
Discussion by Natalia Fabra (UC3M)

Conference on the Economics of Energy Markets

Toulouse, 18 June, 2019

Overview

Difficult to beat this paper on policy relevance!

How to design efficient and equitable electricity rates?

Overview

Difficult to beat this paper on policy relevance!

How to design efficient and equitable electricity rates?

- ▶ Energy transition creates a challenge for electricity rate design:
 - ▶ Large share of fixed costs (new capacity investments, networks)
 - ▶ Large discrepancies in marginal costs (across time+location)

Difficult to beat this paper on policy relevance!

How to design efficient and equitable electricity rates?

- ▶ Energy transition creates a challenge for electricity rate design:
 - ▶ Large share of fixed costs (new capacity investments, networks)
 - ▶ Large discrepancies in marginal costs (across time+location)
- ▶ Current **flat rates** create distortions:
 - ▶ **Allocative inefficiencies** if prices do not reflect changing marginal costs
 - ▶ **Investment inefficiencies and distributional concerns** if fixed costs are recovered through volumetric charges

Overview

Difficult to beat this paper on policy relevance!

How to design efficient and equitable electricity rates?

- ▶ Energy transition creates a challenge for electricity rate design:
 - ▶ Large share of fixed costs (new capacity investments, networks)
 - ▶ Large discrepancies in marginal costs (across time+location)
- ▶ Current **flat rates** create distortions:
 - ▶ **Allocative inefficiencies** if prices do not reflect changing marginal costs
 - ▶ **Investment inefficiencies and distributional concerns** if fixed costs are recovered through volumetric charges
- ▶ Fixed cost recovery + efficient short-run prices?
- ▶ **Two-part tariffs** $A + pq$, with $A=FC$ and $p=MC$
- ▶ Again concerns two-part tariffs might be **regressive**

Findings

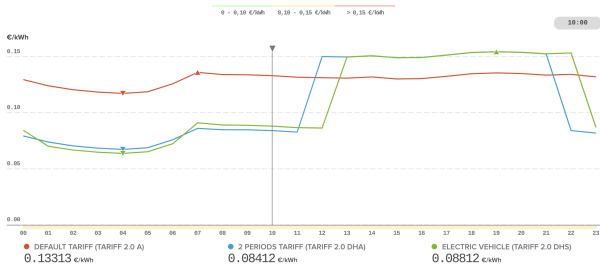
- ▶ Shift towards **real-time pricing** (RTP)
 - ▶ Low income consumers benefit
- ▶ Shift towards **higher fixed fees**
 - ▶ Low income consumers are hurt

Findings

- ▶ Shift towards **real-time pricing** (RTP)
 - ▶ Low income consumers benefit
- ▶ Shift towards **higher fixed fees**
 - ▶ Low income consumers are hurt
- ▶ Authors' proposal:
 - ▶ RTP + lower fixed fees for lower income groups

Discussion

- ▶ Electricity rates in Spain remind me to this proposal:
 - ▶ Fixed fee is a function of contracted power + *social discount*
 - ▶ Time of Use volumetric charges (opt in)
 - ▶ Real Time Pricing by default (+ opt out)



Marginal rates over a day (volumetric charge+RTP)

Reminds me of electricity rates in Spain...

COMERCIALIZADOR DE REFERENCIA

IBERDROLA COMERCIALIZACIÓN DE ÚLTIMO RECURSO, S.A.U.
CIF A-95554630
Domicilio social: Plaza Euskadi 5, 48009 Bilbao

RESUMEN

| | |
|-----------------------------------|-----------------------|
| Por potencia contratada | 31,11 € |
| Por energía consumida | 60,91 € |
| Descuento por bono social | -15,45 € |
| Impuesto electricidad | 3,91 € |
| Alquiler equipos medida y control | 1,39 € |
| IVA | 21% s/81,87 € 17,19 € |

TOTAL IMPORTE FACTURA: 99,06 €

INFORMACIÓN DEL CONSUMO ELÉCTRICO

| | Consumo en el periodo punta | Consumo en el periodo valle |
|--|-----------------------------|-----------------------------|
| Verano ("") | 13h-23h | 23h-13h |
| Lectura anterior: real (15 de abril de 2019) | 011399 kWh | 010363 kWh |
| Lectura actual: real (16 de mayo de 2019) | 011644 kWh | 010816 kWh |
| Consumo en el periodo | 245 kWh | 453 kWh |

Consumo bonificado: 351.62 kWh
Consumo sin bonificar (consumo total-consumo bonificado): 346.38 kWh

An example of a residential electricity bill

Discussion

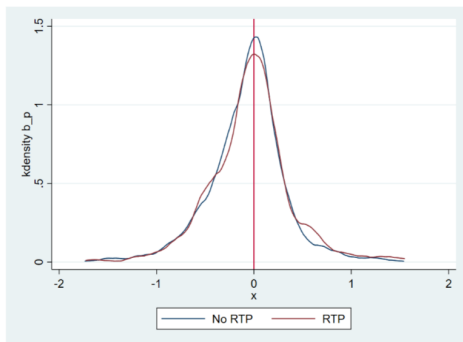
1. How elastic is residential electricity demand?
 - ▶ Distortions depend on demand responsiveness

Discussion

1. How elastic is residential electricity demand?
 - ▶ Distortions depend on demand responsiveness

How elastic is residential electricity demand?

Fabra, Reguant and Rapson (2019)
Real-Time Pricing for Everyone: Evidence from the Spanish
Electricity Market



Elasticities to RTP for a large set of Spanish households
Distributions centered around zero, median of no response
Very similar distributions for RTP and non-RTP customers

Discussion

2. Response to marginal prices? Or to average prices?

Discussion

2. Response to marginal prices? Or to average prices?

▶ Labandeira *et al.* (2019):

- ▶ Reform in Spanish electricity rates: higher fixed fee, lower volumetric charge
- ▶ **Substantial reduction in electricity consumption:**
households response to a higher average price rather than a lower marginal price
- ▶ **Heterogenous and regressive effects across households:**
poorer households did not reduce their consumption; thus their bills increased

Discussion

2. Response to marginal prices? Or to average prices?

- ▶ Labandeira *et al.* (2019):
 - ▶ Reform in Spanish electricity rates: higher fixed fee, lower volumetric charge
 - ▶ **Substantial reduction in electricity consumption:** households response to a higher average price rather than a lower marginal price
 - ▶ **Heterogenous and regressive effects across households:** poorer households did not reduce their consumption; thus their bills increased

3. The role of externalities?

- ▶ "We ignore the role of externalities"
- ▶ Do volumetric charges compensate unpriced externalities?

Great paper!...
which you will all enjoy reading