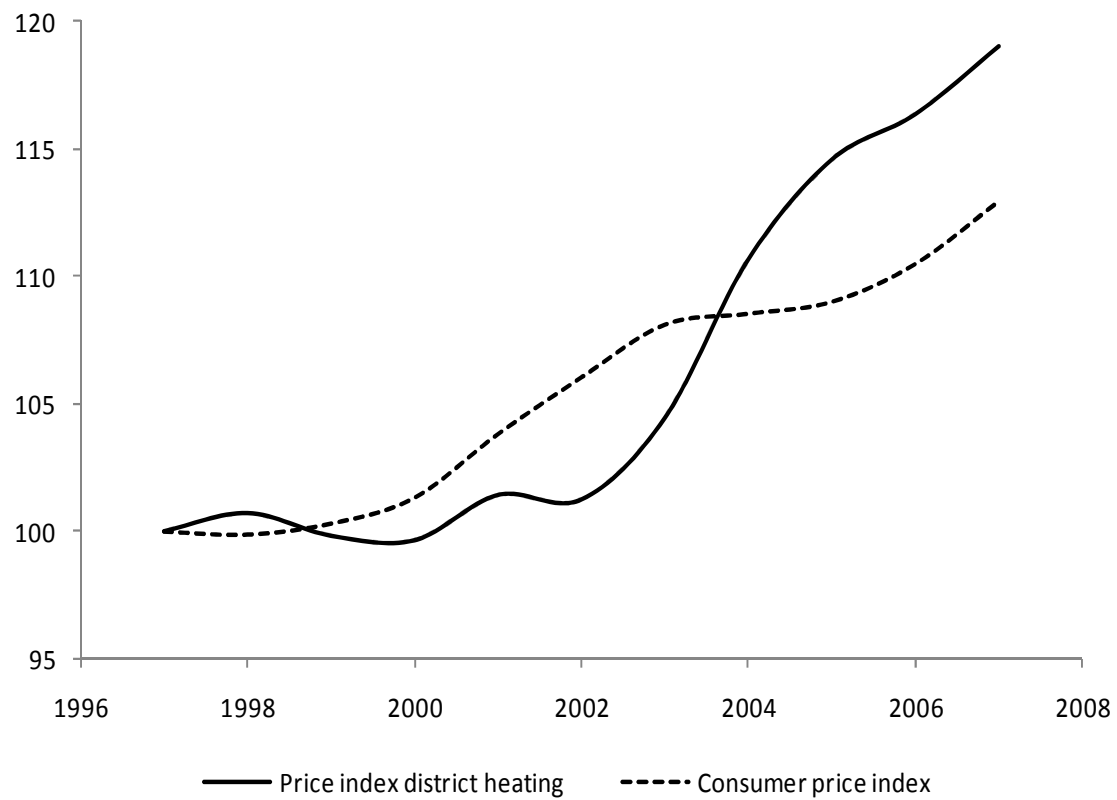


# Switching Costs and Lock-in effects — The Swedish Market for Residential Heating

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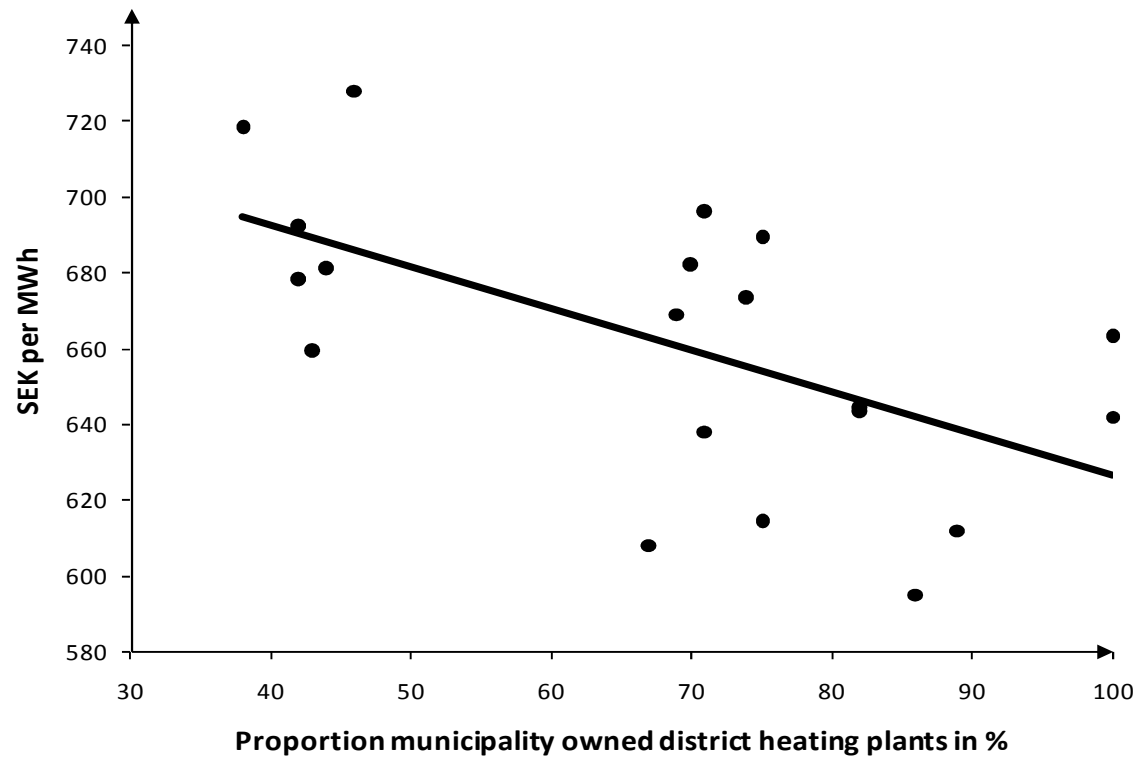
## Price development district heating, 1997-2007



## Average price and price spread for district heating in SEK/MWh

Owner	Average price	Standard deviation	Minimum	Maximum
Fortum (private)	748	34	684	784
Vattenfall (state)	719	52	606	815
E.ON (private)	684	44	598	748
Other private	701	41	626	770
Municipal	648	80	405	796

Source: Swedish Energy Markets Inspectorate



Ownership and price, 2007

Source: Swedish Energy Markets Inspectorate

# Switching Costs & Lock-in effects?

Are different switching costs a good (or even relevant) measure of lock-in effects?

Or..

Are un-cashable switching benefits a better sign of lock-ins?

# Switching Costs & Lock-in effects

“A switching cost results from a consumer’s desire for compatibility between current purchase and previous investment” (Klemperer 1995)

- Need for compatibility
- Transaction cost of switching suppliers
- Learning cost to use new brands
- Quality uncertainty of new brands
- Loyalty
- Learned to like it (psychological costs)
- Replacement of equipment*
- Fierce “ex-ante” competition and homogenous products leads to “ex-post” monopoly power and heterogeneous products

## Lock-in, a vague concept.

- According to the management literature a locked-in customer is a loyal customer created by real or imaginary switching costs.
- For an economist(?) a locked-in consumer is a consumer who “wants out”, i.e. a lock-in effect is a market failure.

# Switching cost = The cost of changing system:

Assuming initial investment cost for already installed system (A) is sunk

$$SC_{AB} = \textit{per unit fixed and variable cost of B} - \textit{per unit variable cost of A}$$

If  $SC_{AB}$  is positive the consumer lacks the economic incentive to change

If  $SC_{AB}$  is zero the consumer is indifferent between systems

If  $SC_{AB}$  is negative the consumer would benefit from a change from system **A** to **B**

The assumption then is:

**If a negative value of switching cost prevails in the longer run the consumer is either (voluntarily) LOYAL or (in-voluntarily) LOCKED-IN**

**Sustained presence of negative switching cost, i.e.  
SWITCHING BENEFITS means either  
(voluntarily) LOYAL consumers or  
(in-voluntarily) LOCKED-IN consumers**

Explaining the sustained presence of switching benefits

Type	Source
Loyalty	<ul style="list-style-type: none"><li>-Compatibility need</li><li>-Unobservable transaction cost</li><li>-Learning cost</li><li>-Quality uncertainty</li><li>-Contracts &amp; Loyalty programs</li><li>-Psychological costs</li></ul>
Lock-ins	<ul style="list-style-type: none"><li>-Market failures</li></ul>



# Calculating switching cost

**$SCC_{P,A}$**  = The switching cost *from the present system to the alternative* system measured in some “unit measure”

$$SCC_{P,A} = F_A + V_A - V_P$$

This means basically that a consumer should be indifferent between the systems if:

$$F_A + V_A = V_P$$

stay loyal if:

$$F_A + V_A > V_P$$

and change if:

$$F_A + V_A < V_P$$

### Switching costs in Luleå 2007, SEK/kWh

From district heating	To	Heat pump	Pellet burner
Single house		0.52	0.46
Residential building		0.25	0.18

### Switching costs in Stockholm 2007, SEK/kWh

From district heating	To	Heat pump	Pellet burner
Single house		0.15	0.09
Residential building		-0.12	-0.19

This paper has made one attempt to calculate the “ex-post” lock-in effect, i.e. the lock-in effects created *after* a decision on what heat system to use has been made. Without any regard to the ex-ante competition this study calculates switching costs for switching heat system *from* district heating *to* pellet burners or heat pumps.

The analysis show that there exist relatively substantial negative switching costs converting from district heating to pellet burning or the use of heat pumps in residential areas in Stockholm. With limited relevant markets, district heating being the only alternative, *this negative switching cost cannot be capitalized and represents most probably a lock-in effect.*

The result indicates that we cannot reject the idea that the district heating plants serving residential areas in Stockholm abuse their dominant position with a reduction of the social welfare as a result.