

The Power of Mandatory Quality Disclosure: Evidence from the German Housing Market

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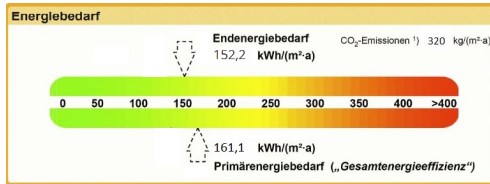
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Research questions

Which sellers disclose energy efficiency information voluntarily?
What is the impact of mandatory disclosure rules on prices?

Energy efficiency information

Central element of EPC:



EPC information in ads:

The screenshot shows a real estate advertisement for a house. On the left, there is a photo of the house and some basic details: price 595.000 €, 7 rooms, 192,06 m² living area, and 576 m² total area. On the right, there is a table of technical specifications. A blue box highlights the 'Endenergiebedarf' value of 152,2 kWh/(m²*a) from the 'Energie' section.

Energie	
Endenergiebedarf	152,2 kWh/(m ² *a)
CO ₂ -Emissionen ¹⁾	320 kg/(m ² *a)

Endenergiebedarf 152,2 kWh/(m²*a)

- Detailed data on real estate ads from Immobilienscout24
 - Offer price
 - House characteristics (size, rooms, quality, etc.) and location
 - EPC data (energy consumption, heating type, year of construction, etc.)
 - Seller type (bank, estate agent, private)
- Time span: 2013-2015
- Focus on the market for used houses

Disclosure prior to policy change

Estimation equation:

$$EPC_i = \alpha + \beta X_i + \gamma Bank_i + \delta Agent_i + \mu_r + \nu_t + \epsilon_i$$

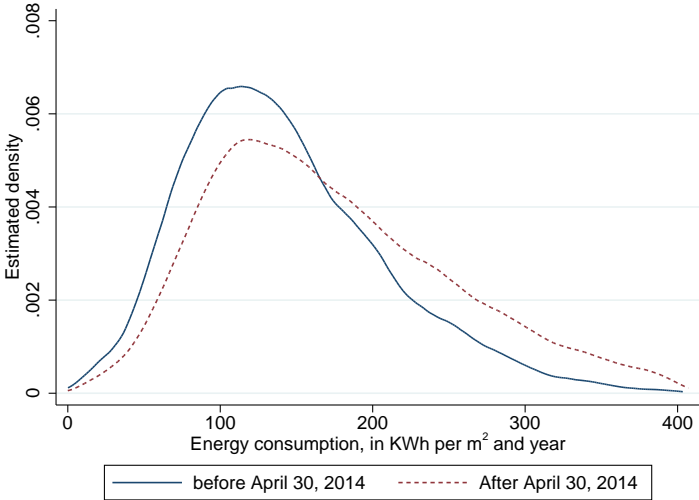
- EPC_i : dummy indicating that EPC is disclosed
- X_i : house characteristics
- $Bank_i, Agent_i$: respective seller type
- μ_r : zip code fixed effects
- ν_t : time fixed effects

Disclosure prior to policy change

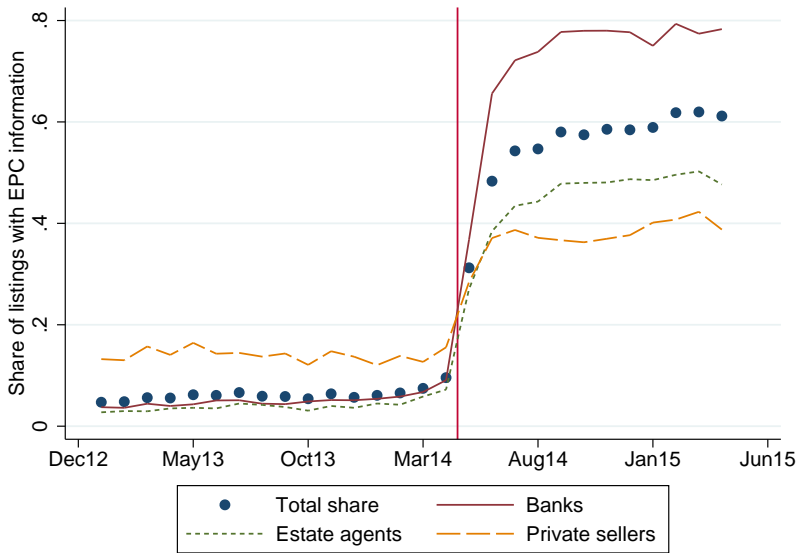
Variable	Category	Parameter estimate	Std. errors
Constant		0.104**	0.027
Year of construction (base: pre 1930)	2002-2007	0.038**	0.004
	2008-2013	0.126**	0.007
Year of modernization (base: pre 1930)	2002-2007	0.028	0.016
	2008-2013	0.043**	0.016
Self-rated quality (base: normal)	superior	0.036**	0.003
Heating system (base: central heating)	oven	-0.020**	0.007
Seller type (base: private)	Banks	-0.021**	0.003
	Estate agents	-0.032**	0.003
Time and zip code FE		✓	
Lot size, #Rooms, etc.		✓	
Sample size		96,484	

Notes: ***,**,* denote statistical significance at the 1 %, 5 %, 10 % level, respectively. Included housing characteristics: house type, size of the house, lot size, #Rooms

Disclosed qualities (pre and post)



Heterogeneous reaction to policy change



Disclosure effects: empirical strategy

- Disclosure (EPC_i) is endogenous
- Instrumental variable differences-in-differences (IV-DiD)
- Instruments: $Banks_i * PostApril_i$ and $Agents_i * PostApril_i$
- Identifies the LATE (ATE for sellers that are induced by mandatory rules to disclose)
- Estimation by 2SLS

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Estimation equation:

$$\ln Price_i = \alpha + \beta X_i + \gamma Bank_i + \delta Agent_i + \tau EPC_i + \mu_r + \nu_t + \epsilon_i$$

Impact of EPC disclosure on prices

	OLS	IV	IV (by subgroups of year of construction)			
			n.a.	pre 1977	1978-2002	after 2002
<i>EPC</i>	0.032**	-0.051**	-0.270**	-0.043**	-0.005	0.004
Standard Errors	(0.002)	(0.011)	(0.056)	(0.016)	(0.017)	(0.028)
Zip code fixed effects	✓	✓	✓	✓	✓	✓
Month fixed effects	✓	✓	✓	✓	✓	✓
House characteristics x	✓	✓	✓	✓	✓	✓
Number of observations	165,057	165,057	22,624	82,346	47,905	12,182

Notes: Standard errors are in parentheses. ** denotes statistical significance at the 1% level, * at the 5% level.

Results

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- “Compliers” to the mandatory disclosure rules decrease offer prices by some 5 %
- Tentative evidence that price decrease is especially large for old houses
- Results are consistent with strategic withholding of information by sellers (at the expense of buyers)

Thank you for your attention. Any comments?

Table: Placebo Regression Results

	Banks		Agents	
	Coeff. s	Std. Errors	Coeff. s	Std. Errors
PostJan2013	0.002	0.014	-0.000	0.014
PostFeb2013	-0.002	0.010	0.009	0.010
PostMar2013	0.002	0.008	0.004	0.008
PostApr2013	-0.004	0.007	-0.000	0.007
PostMay2013	-0.002	0.007	0.002	0.007
PostJun2013	0.001	0.006	0.002	0.006
PostJul2013	-0.002	0.006	-0.002	0.006
PostAug2013	-0.002	0.006	-0.004	0.006
PostSep2013	-0.002	0.006	-0.003	0.006
PostOct2013	0.002	0.006	-0.003	0.006
PostNov2013	0.005	0.007	0.003	0.007
PostDec2013	0.005	0.007	0.004	0.007
PostJan2014	0.002	0.008	0.000	0.008
PostFeb2014	0.009	0.009	-0.001	0.009
PostMar2014	0.021	0.012	0.007	0.012
Zip code fixed effects		✓		✓
Month fixed effects		✓		✓
Housing characteristics x_j		✓		✓
Number of observations:	95,844		95,844	

Notes: ** denotes statistical significance at the 1% level, * at the 5% level

Table: Robustness Checks

	Observations originating from Jan 2014 - Feb 2014 or July 2014 - Dec 2014	House Prices p in Levels Full sample
EPC	-0.054** (0.012)	-13,031** (2,571)
Zip code fixed effects	✓	✓
Month fixed effects	✓	✓
House characteristics x_i	✓	✓
Number of observations	140,756	165,057

Notes: Standard errors are in parentheses. ** denotes statistical significance at the 1% level, * at the 5% level.