



## RESEARCH BRIEF

# Energy Efficiency, Information, and the Acceptability of Rent Increases: A Multiple Price List Experiment with Tenants

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*This paper provides novel empirical evidence on the role of imperfect information and attentional biases in the context of energy efficiency investments in rented properties. We employ a multiple price list experiment that quantifies how alternative informational interventions affect tenants' acceptance of rent increases in exchange for improved energy efficiency of their heating appliance.*

Despite positive private and social returns expected from energy efficiency investments, the adoption of energy efficient technologies is slow, and considerable resources are being directed to policies stimulating take-up (e.g. Allcott and Greenstone, 2012; Gillingham and Palmer, 2014). Rented properties represent a particularly challenging case, since higher up-front investment costs associated with energy efficiency are borne by property owners, whereas tenants benefit from lower energy bills. The associated landlord-tenant split incentives constitute a major barrier to the improvement of energy efficiency in the stock of residential buildings (Gillingham et al., 2012; Davis, 2012).

Generating a positive return on energy efficiency investments requires the ability to increase rents. However, landlords may have difficulties to signal the

value of future energy savings to tenants, leading to information asymmetries as documented in Myers (2018). In this paper, we provide experimentally controlled evidence on the role of information provision in a landlord-tenant split incentive context. We study a situation in which the landlord needs to replace the central heating appliance, and can either install a standard option (efficiency label B, Council of European Union, 2013) or a more energy efficient one (labeled A+). Holding the level of comfort fixed across alternatives, we design a multiple price list (MPL) experiment (Andersen et al., 2006; Anderson et al., 2007) in which we systematically vary rent increases associated with the more efficient option.

After a baseline MPL task, we quantify the impact of alternative informational interventions on tenants' valuation of improved energy efficiency. To do so, we

follow Newell and Siikamäki (2014) and Allcott and Taubinsky (2015) and randomly assign subjects to alternative treatments providing information about financial implications of their choices, where each treatment combines two sequential information screens. We then employ a second MPL task to measure how within-subject information disclosure affects the acceptability of rent increases. Furthermore, a between-subject comparison provides forensic evidence across information conditions based on illustrative figures derived from the Swiss policy context, focusing on financial savings, energy bills variability, and CO2 tax payments.

Our experiment is administered to an online panel of 406 Swiss tenants. We find that average willingness to pay (WTP) for efficiency label A+ relative to B is CHF 37.51 per month (about CHF 450 or USD 470 per year), roughly 3% of median rents in Switzerland. However, after providing specific financial information about expected energy savings associated with the more efficient option (namely CHF 40 per month), the endline average WTP estimate is CHF 64.87 per month (about CHF 780 or USD 810 per year). Informing tenants about CHF 1 in expected energy savings thus translates to an acceptable rent increase of CHF 1.62. Our results suggest further that adding information about past variability in energy bills dampens the impact of financial information, whereas information about CO2 tax payments has no incremental impact on tenants' WTP.

We also find significant heterogeneity across respondents, and quantify how the average treatment effect is driven by changes along the entire WTP distribution. Specifically, we document that around 30% of tenants adjust their WTP to bunch around the level of financial savings provided in our informational intervention. Around 20% of tenants oppose rent increase and do not respond to information, whereas tenants' valuation in the upper tail of the distribution exceeds financial savings, presumably on account of pro-environmental motives. Given the lack of impact of CO2 tax information on WTP, our results contribute to a growing literature on consumers' perception of externality-correcting taxes (Houde and Aldy, 2017; Lanz et al., 2018).

Taken together, our results suggest that tenants are willing to support part of the additional investment cost through higher rents, and highlight the importance of providing realistic ex-ante estimates of financial savings associated with energy efficiency investments (see e.g. Fowlie et al., 2017). Moreover, interventions by a third party could be instrumental in reaching ex-ante agreements, so as to share the financial risk across multiple parties (Sorrell, 2007). Facilitating coordination between landlords and tenants, for instance by providing standardized pre-renovation contracts, could reduce transaction costs and therefore increase the rate of energy efficiency investments in rented properties.

## References

- Allcott, H. and M. Greenstone (2012) "Is there an energy efficiency gap?" *The Journal of Economic Perspectives*, 26, 1, pp. 3–28.
- Allcott, H. and D. Taubinsky (2015) "Evaluating behaviorally motivated policy: Experimental evidence from the lightbulb market," *The American Economic Review*, 105, 8, pp. 2501–2538.
- Andersen, S., G. W. Harrison, M. I. Lau, and E. E. Rutström (2006) "Elicitation using multiple price list formats," *Experimental Economics*, 9, 4, pp. 383–405.
- Andersen, S., G. W. Harrison, M. I. Lau, and E. E. Rutström (2007) "Valuation using multiple price list formats," *Applied Economics*, 39, 6, pp. 675–682.
- Council of European Union (2013) "Commission delegated regulation (EU) no 811/2013." Brussels, Belgium.
- Davis, L. (2012) "Evaluating the slow adoption of energy efficient investments: Are renters less likely to have energy efficient appliances?" in D. Fullerton and C. Wolfram eds. *The Design and Implementation of U.S. Climate Policy*: University of Chicago Press, USA.

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- Fowle, M., M. Greenstone, and C. Wolfram (2017) "Do energy efficiency investments deliver? Evidence from the weatherization assistance program," *Quarterly Journal of Economics*, forthcoming.
- Gillingham, K., M. Harding, and D. Rapson (2012) "Split incentives in residential energy consumption," *The Energy Journal*, 33 (2), pp. 37–62.
- Gillingham, K. and K. Palmer (2014) "Bridging the energy efficiency gap: Policy insights from economic theory and empirical evidence," *Review of Environmental Economics and Policy*, 8, 1, pp. 18–38.
- Houde, S. and J. E. Aldy (2017) "The efficiency consequences of heterogeneous behavioral responses to energy fiscal policies." NBER Working Paper No. 17282.
- Lang, G., and B. Lanz, 2018, "Energy Efficiency, Information, and the Acceptability of Rent Increases: A Multiple Price List Experiment with Tenants", MIT CEEPR Working Paper 2018-014.
- Lanz, B., J.-D. Wurlod, L. Panzone, and T. Swanson (2018) "The behavioral effect of pigovian regulation: Evidence from a field experiment," *Journal of Environmental Economics and Management*, 87, pp. 190–205.
- Myers, E. (2018) "Asymmetric information in residential rental markets: Implications for the energy efficiency gap." Energy Institute at Haas Working Paper No. 246.
- Newell, R. G. and J. Siikamäki (2014) "Nudging energy efficiency behavior: The role of information labels," *Journal of the Association of Environmental and Resource Economists*, 1, 4, pp. 555–598.
- Sorrell, S. (2007) "The economics of energy service contracts," *Energy Policy*, 35 (1), pp. 507–521.

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