

A comment on “Smart rationing: Designing Electricity Blackout Policies for Extreme Events

Paper by **Mar Reguant** (Northwestern University)

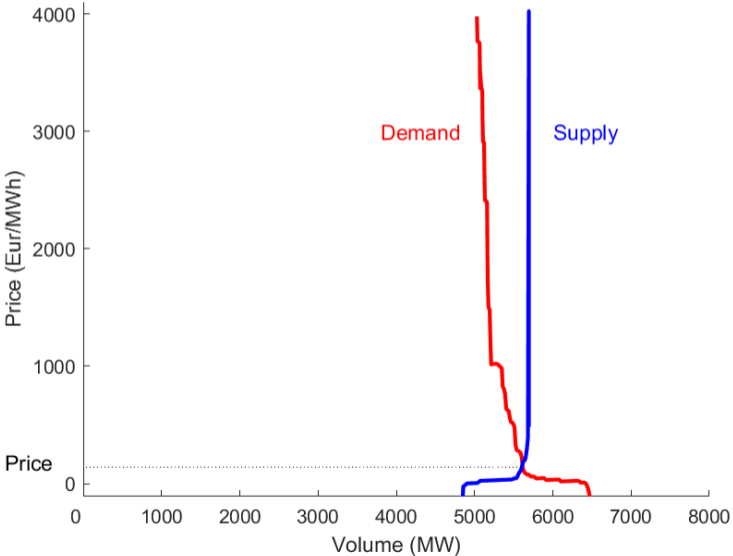
Comment by **Lassi Ahlvik** (University of Helsinki, Helsinki GSE)

Conference of the Yrjö Jahnsson Foundation
on Climate Change and Inequality

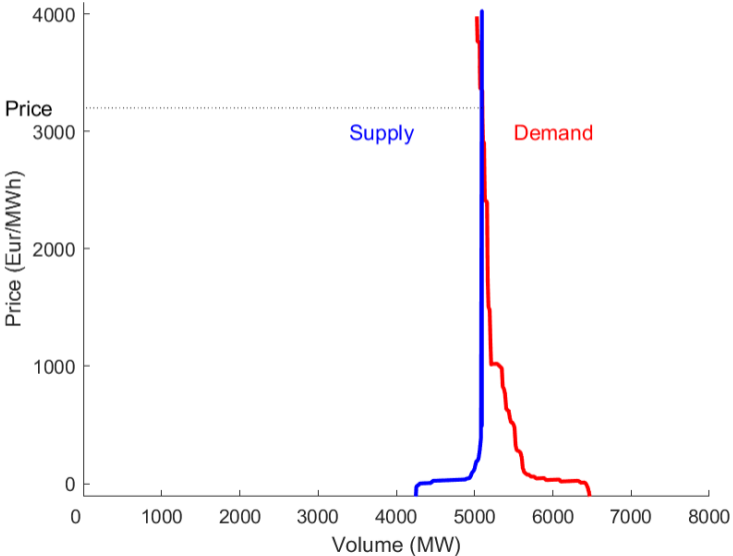
June 13, 2024

Main comment: This is an insightful paper with great data and a clear solution to a real-life policy problem

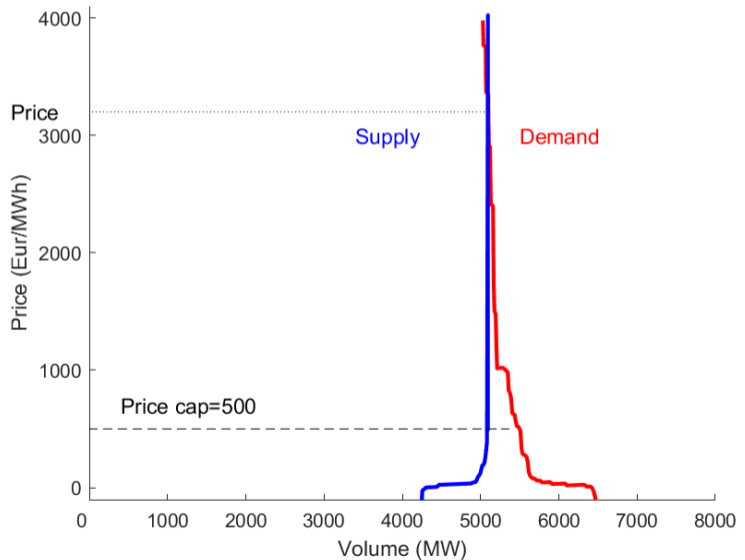
Electricity market (FI) this Tuesday at 10pm: everything is fine



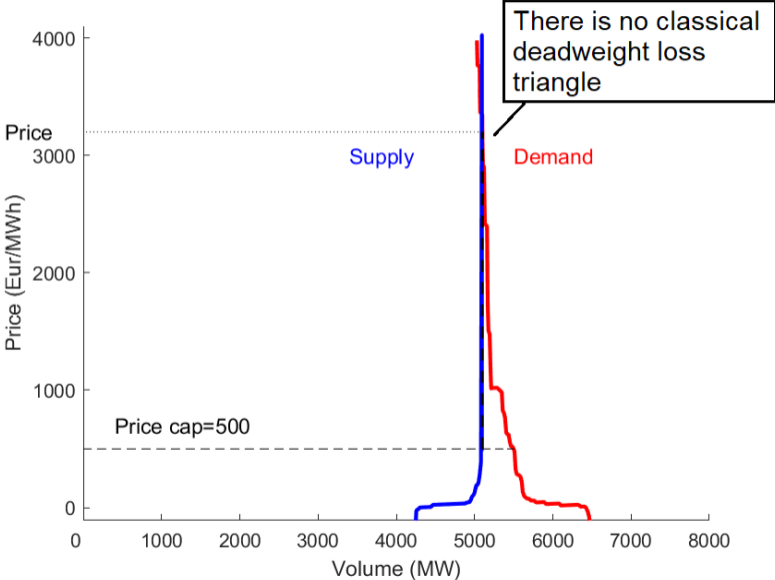
Electricity market (FI) with a supply shock



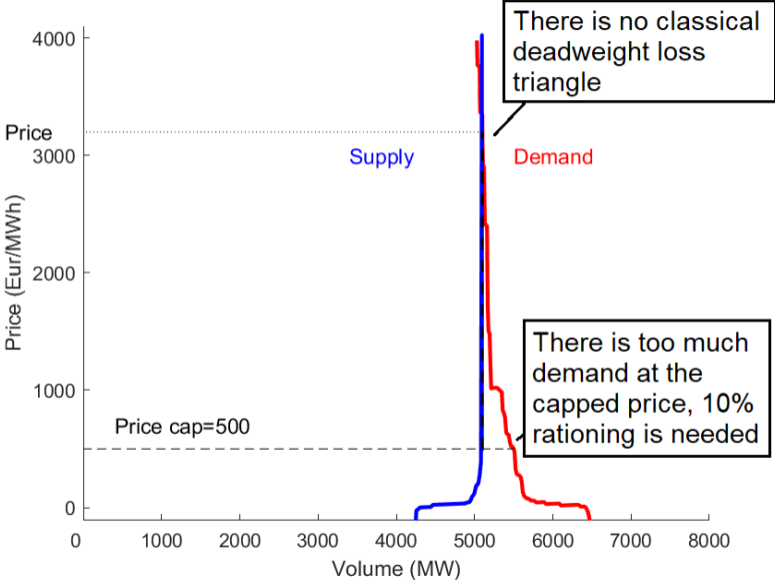
Electricity market (FI) with a supply shock



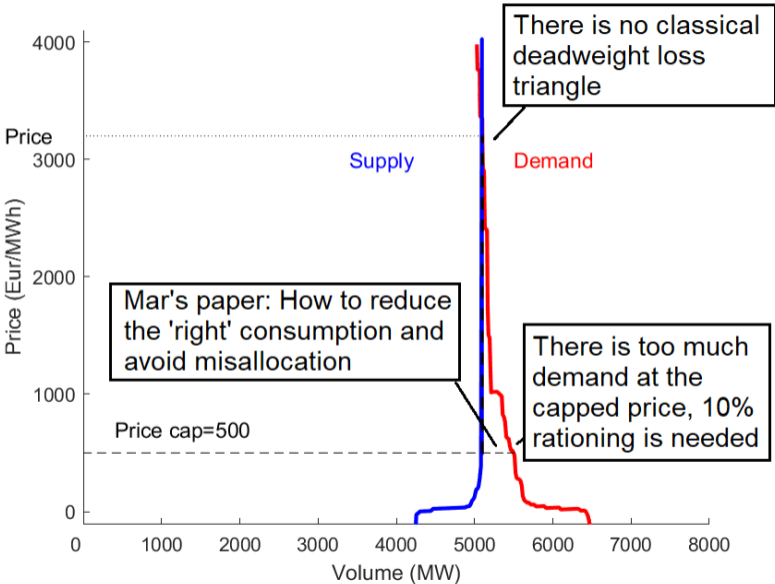
Electricity market (FI) with a supply shock



Electricity market (FI) with a supply shock



Electricity market (FI) with a supply shock



Rolling blackouts are costly, because they reduce average consumption – not marginal consumption

Rolling blackouts are costly, because they reduce average consumption – not marginal consumption

How to identify marginal consumption?

Rolling blackouts are costly, because they reduce average consumption – not marginal consumption

How to identify marginal consumption?

- **This paper:** Partial rationing leaves to the household to reduce their marginal consumption (logic: concave utility, Jensen's inequality)
⇒ Can the rationing rule can influence contracted power, consumption or investments *before* rationing takes place (as in Gerlagh et al. 2024)?

Rolling blackouts are costly, because they reduce average consumption – not marginal consumption

How to identify marginal consumption?

- **This paper:** Partial rationing leaves to the household to reduce their marginal consumption (logic: concave utility, Jensen's inequality)
 - ⇒ Can the rationing rule can influence contracted power, consumption or investments *before* rationing takes place (as in Gerlagh et al. 2024)?
- **Priority rationing contracts:** Use contracts to reveal types before the need for rationing arises (Wilson 1989)
 - ⇒ Could this mechanism be used with smart rationing and inequality considerations?

Rolling blackouts are costly, because they reduce average consumption – not marginal consumption

How to identify marginal consumption?

- **This paper:** Partial rationing leaves to the household to reduce their marginal consumption (logic: concave utility, Jensen's inequality)
⇒ Can the rationing rule can influence contracted power, consumption or investments *before* rationing takes place (as in Gerlagh et al. 2024)?
- **Priority rationing contracts:** Use contracts to reveal types before the need for rationing arises (Wilson 1989)
⇒ Could this mechanism be used with smart rationing and inequality considerations?
- **Another idea:** Identify marginal consumption from earlier price shocks (e.g. the 2022 Energy Crisis)
⇒ If there is persistence in preferences, reaction to shocks can guide optimal rationing policies

Finland: The household-level data also reveals strong correlation between consumption and income (larger houses, bigger families, electric heating, more contracts)

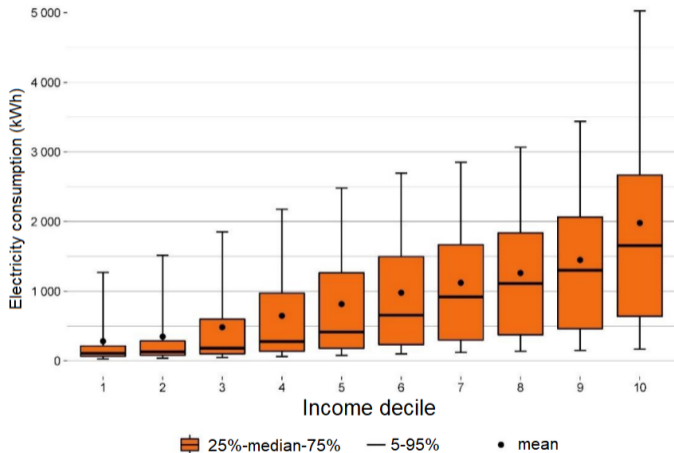
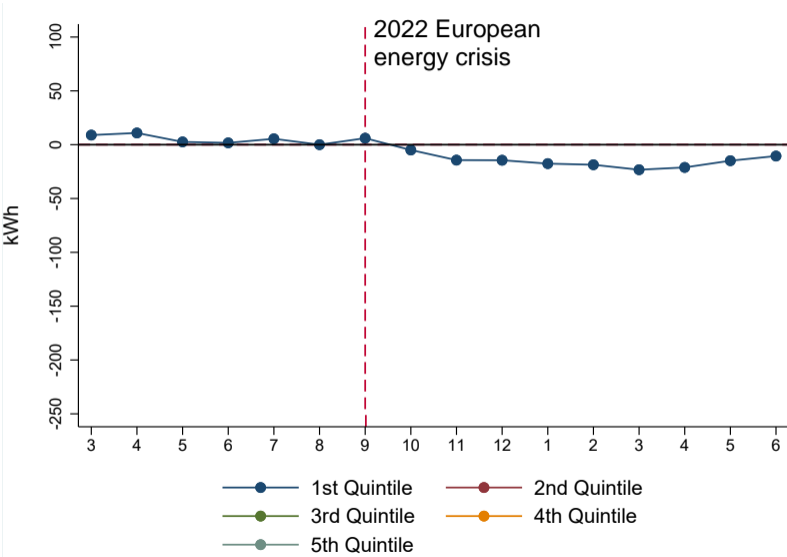
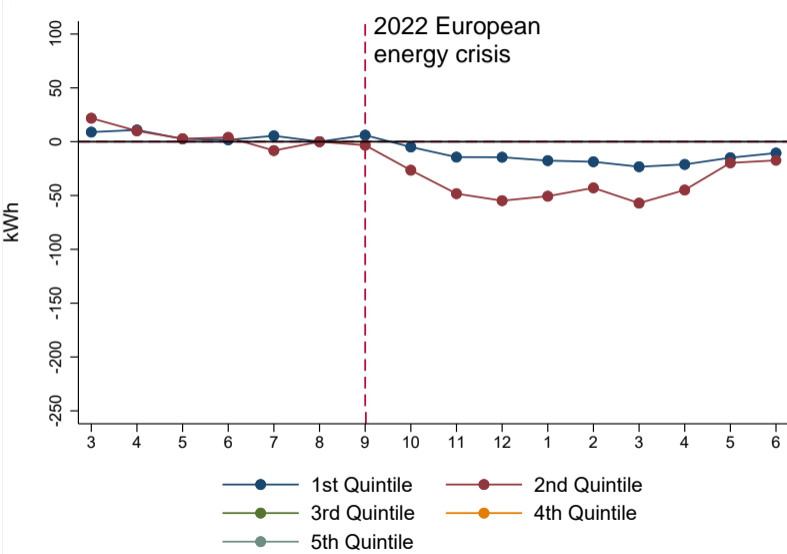


Figure shows household-level consumption for December 2022 (Ahlvik et al. 2023)

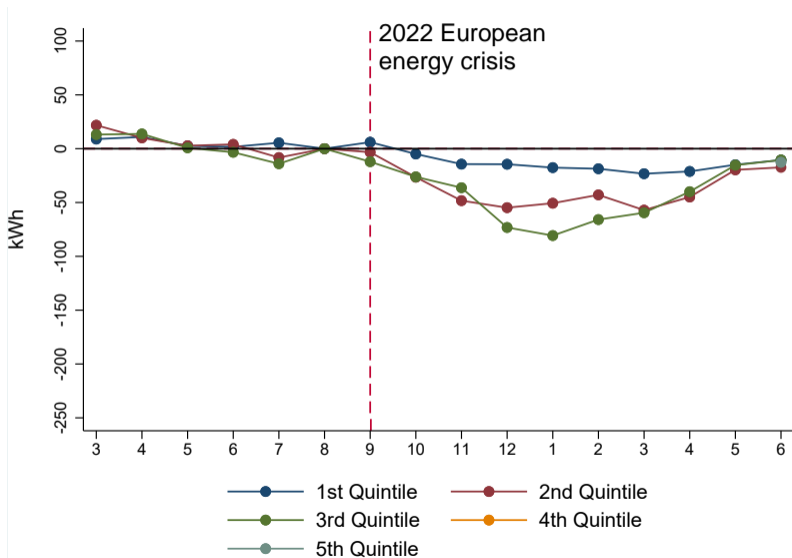
Finland: The impact of the price shock on consumption: Consumers whose contract ended during vs. after the crisis (Ahlvik, Kaariaho, Liski & Vehviläinen, in progress):



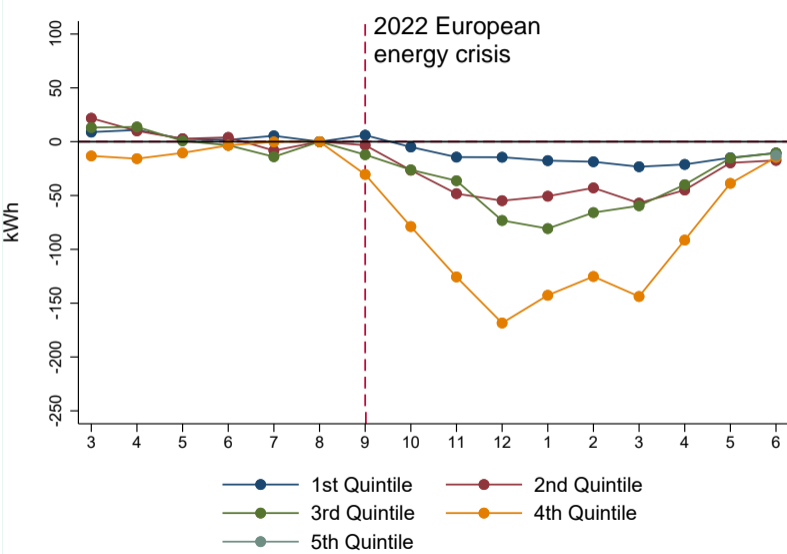
Finland: The impact of the price shock on consumption: Consumers whose contract ended during vs. after the crisis (Ahlvik, Kaariaho, Liski & Vehviläinen, in progress):



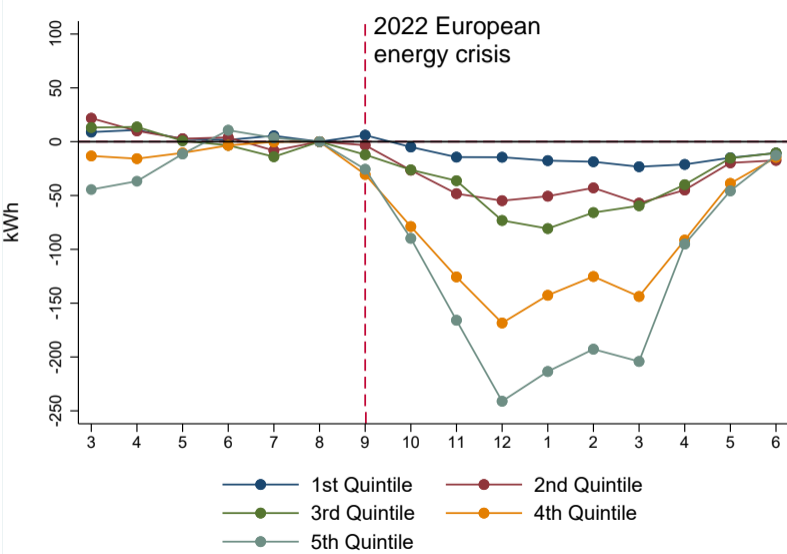
Finland: The impact of the price shock on consumption: Consumers whose contract ended during vs. after the crisis (Ahlvik, Kaariaho, Liski & Vehviläinen, in progress):



Finland: The impact of the price shock on consumption: Consumers whose contract ended during vs. after the crisis (Ahlvik, Kaariaho, Liski & Vehviläinen, in progress):



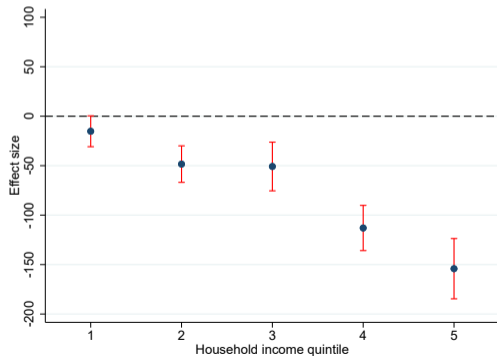
Finland: The impact of the price shock on consumption: Consumers whose contract ended during vs. after the crisis (Ahlvik, Kaariaho, Liski & Vehviläinen, in progress):



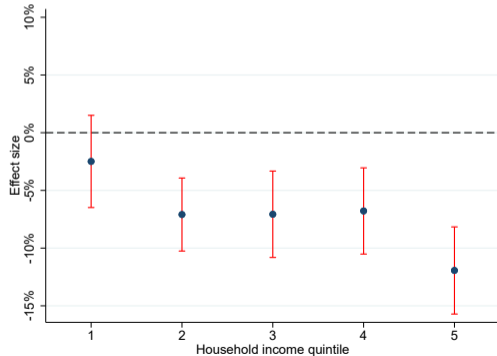
High-income households....

- ...have low value of money (λ_i) and perhaps low welfare-weight (θ_i)
- ...respond most in levels and percentages when the prices spike (low $u'(x_i, \epsilon_i)$)
- ... have higher initial consumption (x_i)
⇒ Power limits (in kWh) seem worth considering

Panel a: Effect of the price hike (kWh)



Panel b: Effect of the price shock (%)



Thank you – I'm looking forward to reading the final version of the paper!

(lassi.ahlvik@helsinki.fi)

- Gerlagh, R., Liski, M., & Vehviläinen, I. (2024). Rational Rationing: A Price-Control Mechanism for a Persistent Supply Shock. Working paper
- Ahlvik, L., Alhola, S., Blauberg, T., Laasonen, H., Liski, M., Malinen, O., Mattila, M., Nokso-Koivisto, O., Sahari, A., Seppä, M., Toikka, M., Valkonen, A. & Vehviläinen, I. (2023). Sähkön hinnannousun ja sähkötukien arvioidut vaikutukset kotitalouksiin.
- Ahlvik, L., Kaariaho, T., Liski, M. Vehviläinen, I. (2024) Economics of energy poverty. Work in progress
- Wilson, R. (1989). Efficient and competitive rationing. *Econometrica: Journal of the Econometric Society*, 1-40.