Optimal Subsidies for the Product Upgrading of Battery Electric Vehicles in China

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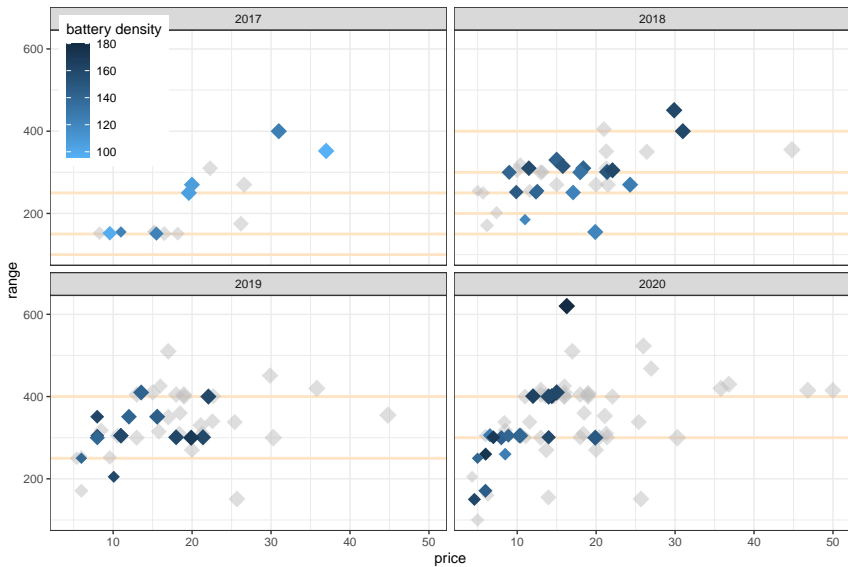
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Motivation

- Attribute-based product subsidies increase demand by lowering the price for consumers.

- This gives firms a stronger incentive to invest in the attribute.

- How do attribute-based product subsidies affect product upgrading?

Trend of BEV attributes

Demand:

$$\delta_{ijft} = \alpha(p_{jft} - \tau_{jft}(R_{jft})) + \gamma R_{jft} + \beta * x_{jft} + \xi_{ijft}$$
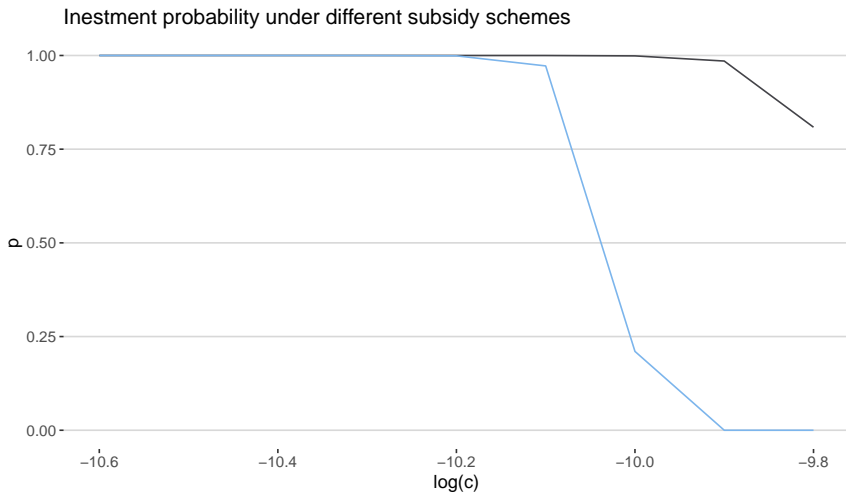
Supply:

$$\pi_{ft} = \sum_{j \in \mathcal{J}_{ft}} N_t s_{jft}(p_{jft} - mc_{jft})$$

$$mc_{jft} = \exp(c_{jft} R_{jft}^2 + \mu * w_{jft} + \eta_{jft})$$

Investment choice:

$$a_{jft}(c, I_t) = \arg\max\{-\lambda + \pi_{jft}(c) + \epsilon_{jft}(1) + \rho * \mathbb{E}[v_{jft}(c')|I_t], \pi_{jft}(c) + \epsilon_{jft}(0) + \rho * \mathbb{E}[v_{jft}(c)|I_t]\}$$

Inestment probability under different subsidy schemes

Conclusion

- Attribute-based threshold subsidies do cause clusters of products around the threshold,
- but it gives a much higher incentive to reduce the marginal cost of the attribute compared to linear subsidies.

Thank you!