Production Synergies and Cost Shocks: Hydropower Generation in Colombia

Michele Fioretti[1] Jorge A. Tamayo[2]

[1]Sciences Po

[2]Harvard Business School

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- *This paper:* production technologies, synergies, and market power

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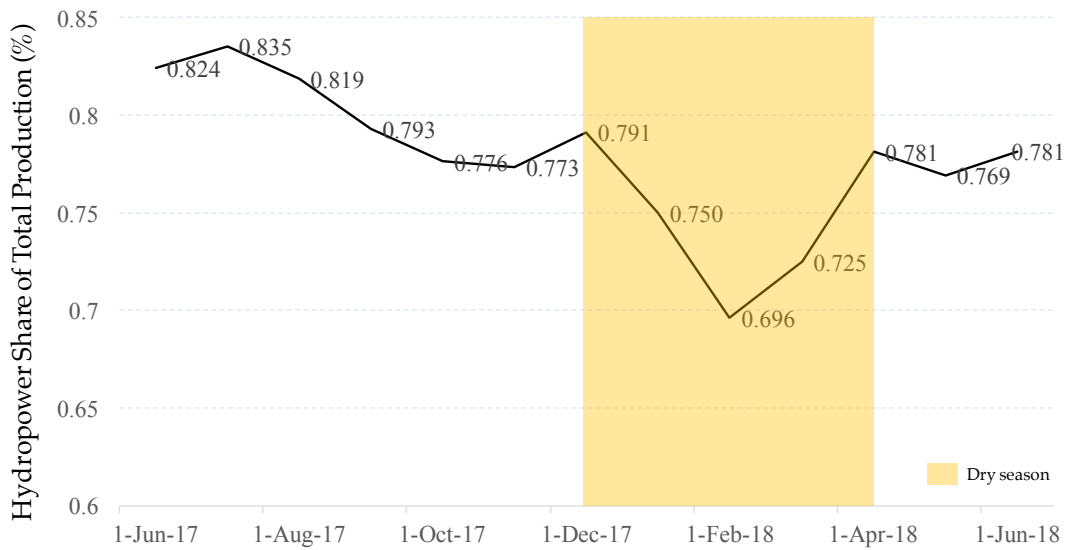
- Hydropower generation constitutes 80% of total energy production
  1. Cost to hydro generators depend on forecasted water inflows
  2. Weather changes create cost shocks



Empirical Framework

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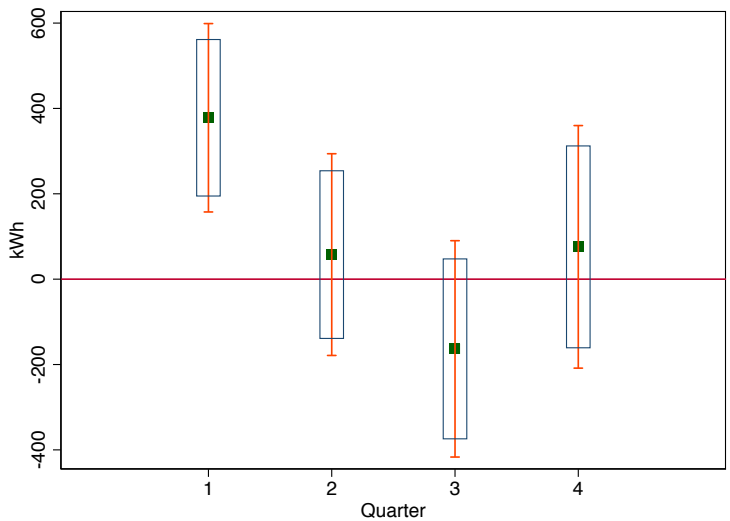

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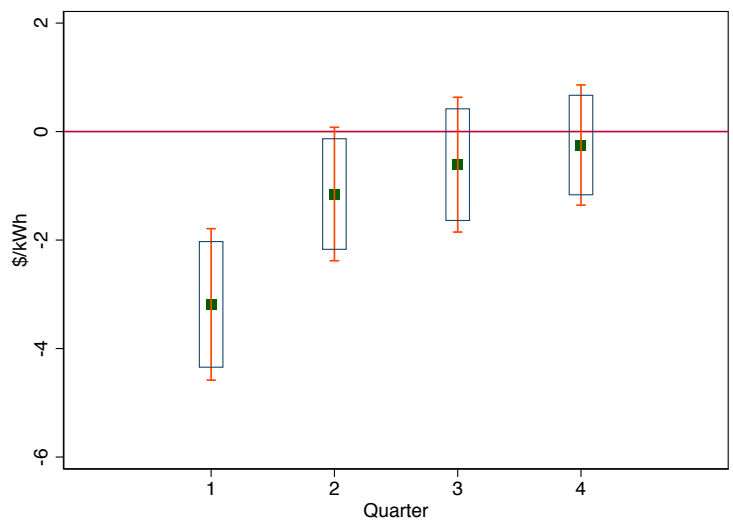

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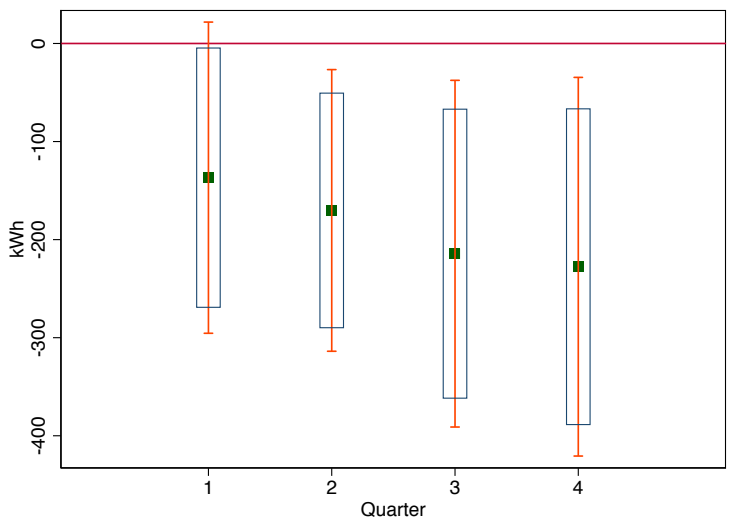

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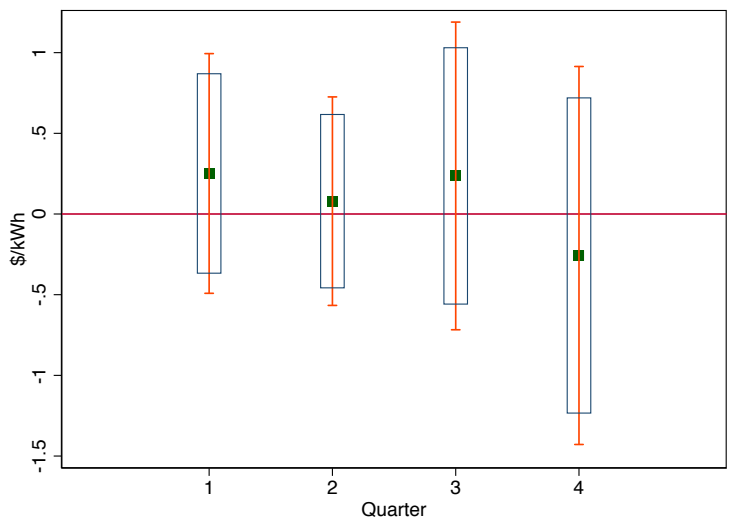

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3. *However, the impact is asymmetric*
   - Siblings thermal plants do not increase spot prices in wet periods

Measuring the Impact on Prices

A Quantitative Model

- For each plant j, hour h and time t, firm i chooses
  1. a daily price-bid b_{ijt}
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  to maximize (e.g., Wolak, 2007)

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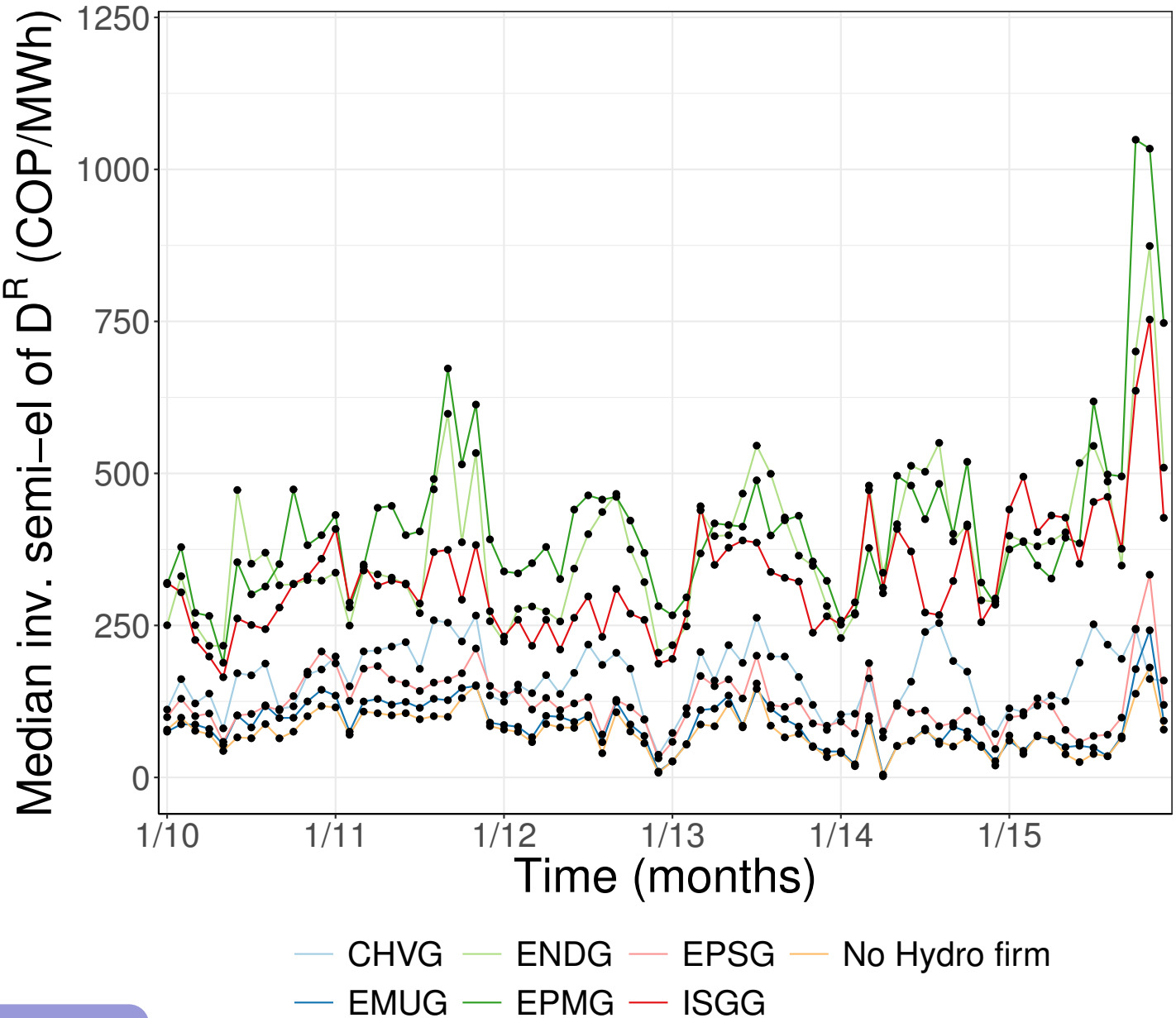
  3. Running simulations of related dynamic Cournot (Reguant, 2014)

Elasticities



Cost Estimation

Conclusions

1. *Production synergies and market power*
   - Standard antitrust policies forcing dismissal of power plants when capacity exceed a threshold can backfire
2. *We focus on the Colombian energy market*
   - Our analysis extends to other energy markets as well as to other production situation with intertemporal shocks
3. *Provide new tools to analyze dynamic multi-unit auctions*

Thank You

michele.fioretti@sciencespo.fr
jtamayo@hbs.edu