

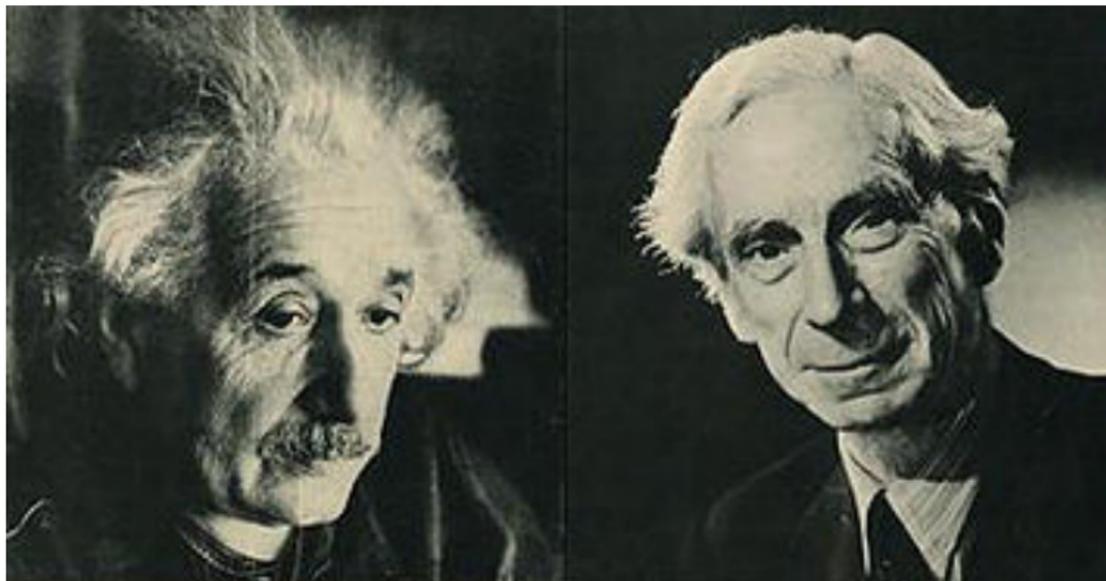
Regression Discontinuity Designs as Natural Experiments

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'Rules' Can Save Social Scientists' Day!

- ▶ The State of California limits elementary school class size to 32 students; 33 is one too many
- ▶ American over-21s can drink legally
- ▶ Despite his third place finish with fan votes, emerging NBA star Luka Doncic wasn't selected for the 2019 All Star Game

'Rules' Can Save Social Scientists' Day!

The level of a running, continuous variable x determines the treatment status of units in a population:

$$D(x) = \begin{cases} 1 & \text{if } x \geq x^* \\ 0 & \text{if } x < x^* \end{cases} \quad (1)$$

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$$D(x) = \begin{cases} 1 & \text{if } x \geq x^* \\ 0 & \text{if } x < x^* \end{cases} \quad (1)$$

For units 'near' the threshold x^* , the process that determines treatment assignment may be as good as random:

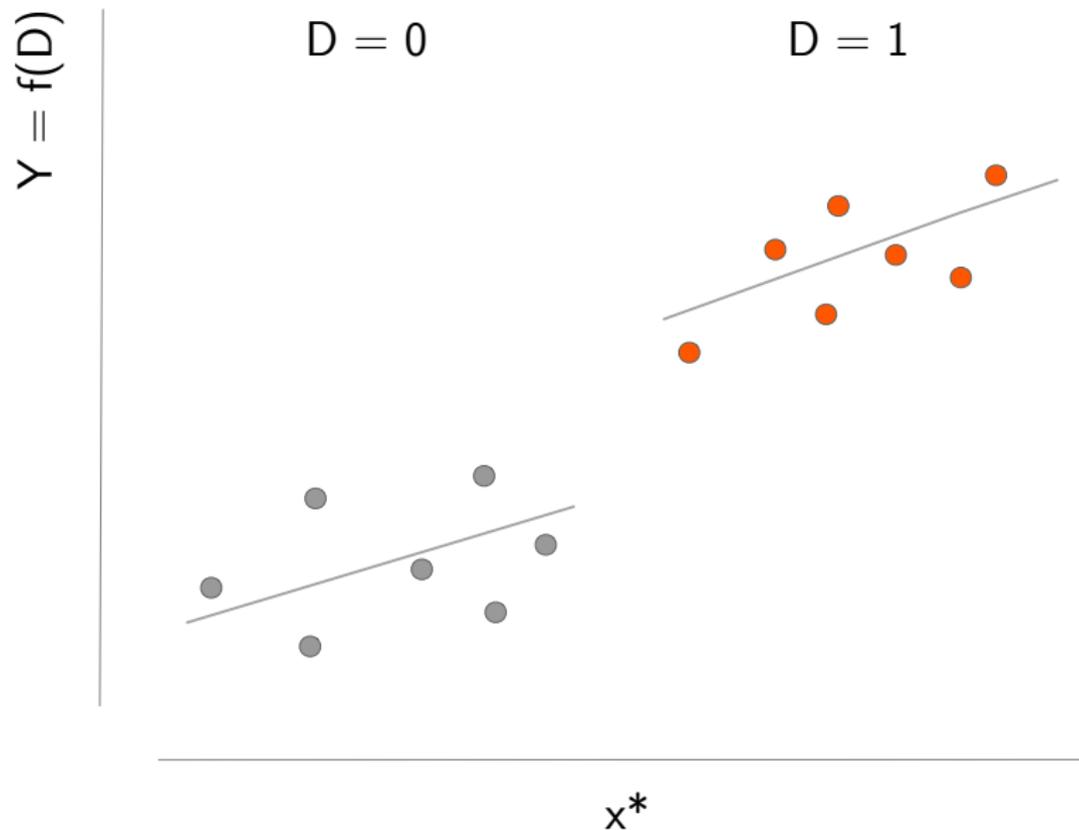
$$D \perp W \quad (2)$$

where W is the array of observable and unobservable confounders.

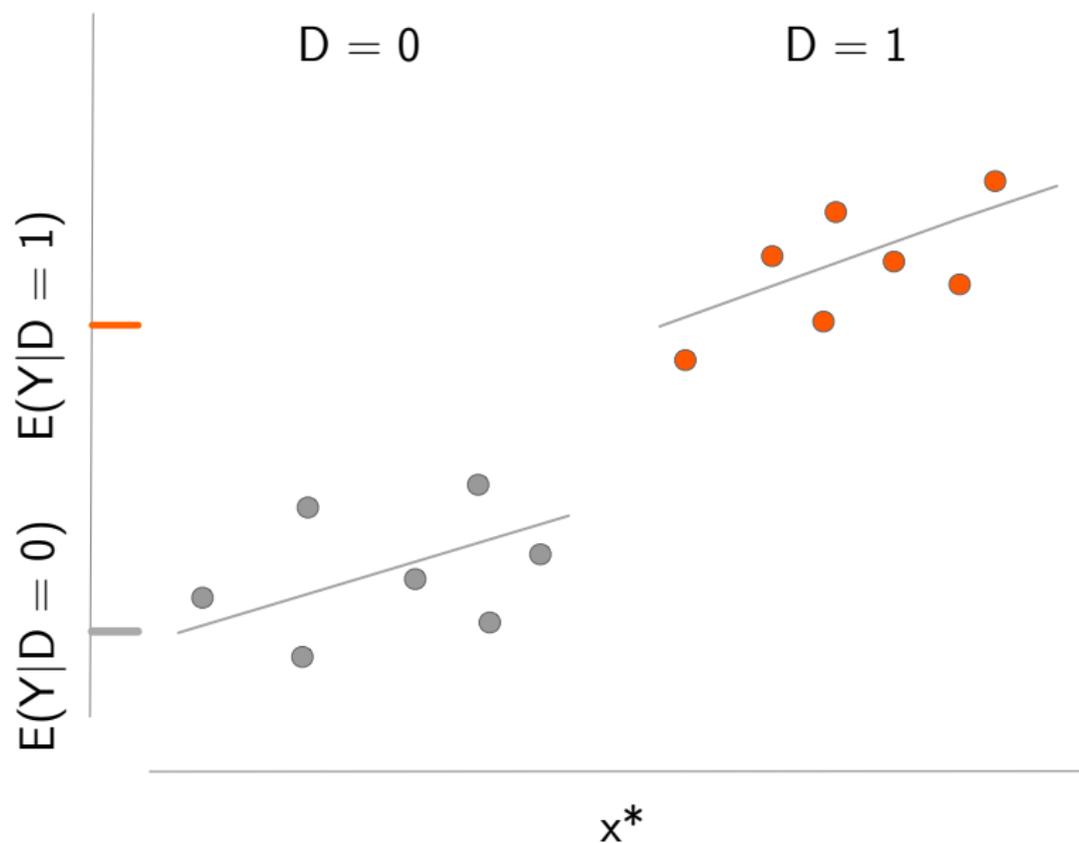
Foci of Attention

- ▶ RD estimation
- ▶ As-if random nature of the treatment
- ▶ Statistical credibility of the model
- ▶ Burning issues

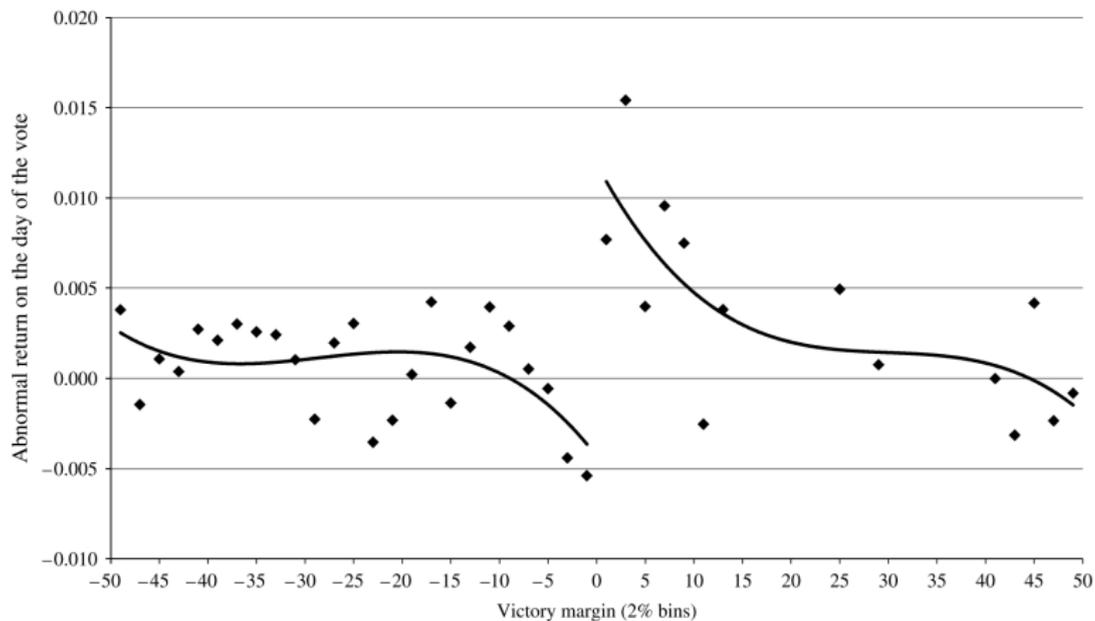
RD Estimation Problem — Visual Representation



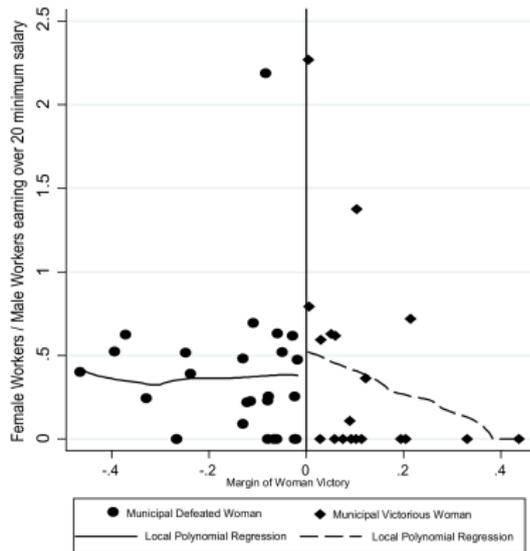
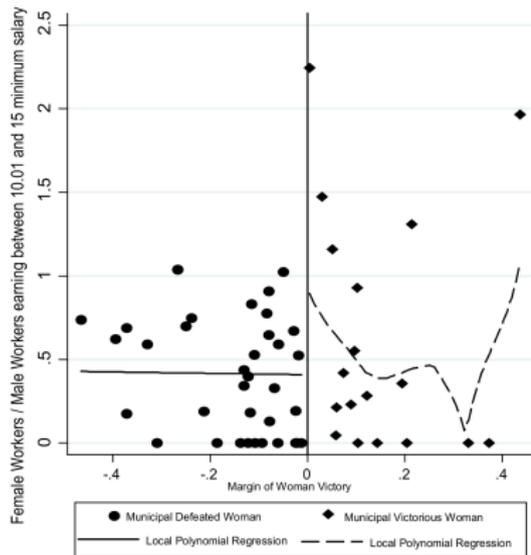
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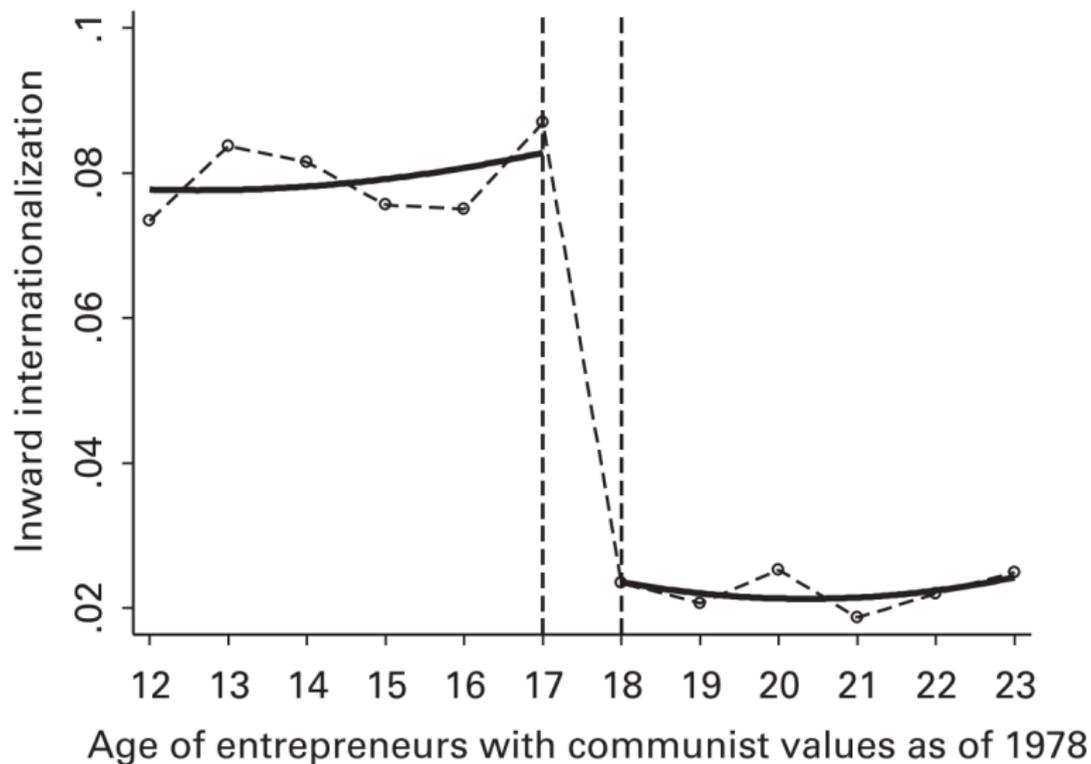
Financial Returns of CSR — Flammer 2018, MS



Queen Bee Effect — Arvate et al. 2018, LQ

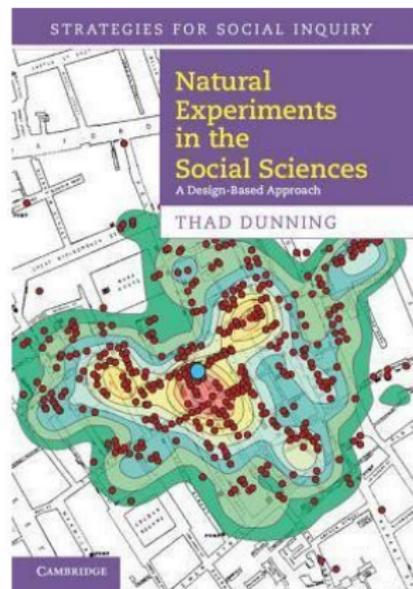


Culture and Entrepreneurship — Marquis & Quiao 2018, ASQ

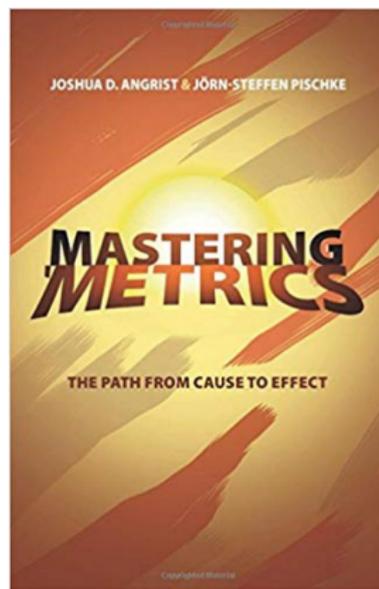


RD Estimation — What's the Bottomline?

Mean comparison test



Regression analysis



RD Design Evaluation: Balance Test

Is there quantitative evidence to support $D \perp W$?

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Consequences of lack of balance on observables:

- ▶ concerns about the as-if random nature of the treatment
- ▶ statistical adjustments (e.g., regression analysis) are needed

RD Design Evaluation: Strategic Sorting Test

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Can units influence the piece of regulation at the center of the RD design?

Scholars may want to conduct a density test (McCrary, 2007):

- ▶ deviations of the empirical distribution function from the theoretical one require attention
- ▶ caveat — in near-winner/near-loser settings conditional densities are mechanically equated (Dunning, 2012)

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Example: students' socio-economic status positively correlates with the likelihood of receiving a merit certificate (x^*). Yet, the likelihood of getting a scholarship decreases as socio-economic status increases. This creates a spike in Y located at medium/high levels of x .

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Simulation methods are particularly suited to conduct a placebo test (see Belloc et al., 2016 — QJE).

RD: Internal- External-Validity Trade-Off

Better LATE Than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009)

Guido W. Imbens

NBER Working Paper No. 14896

Issued in April 2009

NBER Program(s): Labor Studies

Two recent papers, Deaton (2009), and Heckman and Urzua (2009), argue against what they see as an excessive and inappropriate use of experimental and quasi-experimental methods in empirical work in economics in the last decade. They specifically question the increased use of instrumental variables and natural experiments in labor economics, and of randomized experiments in development economics. In these comments I will make the case that this move towards shoring up the internal validity of estimates, and towards clarifying the description of the population these estimates are relevant for, has been important and beneficial in increasing the credibility of empirical work in economics. I also address some other concerns raised by the Deaton and Heckman-Urzua papers.

RD: My 2 cents

- ▶ Rich, qualitative evidence about the regulatory framework is king
- ▶ Keep the statistical model simple — if needed, trade internal validity for external validity