

The Importance of Being Levered

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***“In God I trust, everybody else bring
their data”***



[At Least] Two Empirical Cultures in Strategy & Innovation Research

- ***Grounded Theory/Ethnography/Field Studies/Case Studies***
 - *Where else are worthwhile hypotheses going to come from? (e.g. Fiona Murray's work on tissue engineering and the oncomouse)*

- ***Econometric Studies***
 - *Descriptive studies ("Just the facts, ma'am", as in Gans et al. 2002; Jones on Age and Great Invention ReSTAT 2009)*

 - *Theory-driven studies (e.g., Lerner 1997 on technology races; Klepper and coauthors on the product-life cycle; Lafontaine & Shaw on Franchising)*

 - ***Identification of causal relationships***
 - *What is the effect of VC status on the performance of biotech startups?*
 - *Are knowledge spillovers geographically localized?*
 - *Do long-term incentives really stimulate exploration?*

Which ingredients do papers (of the causal inference type) need?

[David Romer, quoted by Brad DeLong]

- 1. A viewpoint***
- 2. A lever***
- 3. A result***

Types of Lever

- **Randomized experiments**
 - *Nagin et al. 2002 on the “rational cheater” model*

- **Quasi-experiments**
 - *DD and its variants (e.g., Furman & Stern 2010)*
 - *Regression-discontinuity design (e.g., Keys et al. 2010)*
 - *Clever survey design (Stern 2004; Hsu 2004)*
 - *Clever archival data collection (Simcoe & Waguespack 2009; Williams 2010; Fernandez and various coauthors on social networks in hiring)*
 - *Instrumental variables (Doyle 2010 on the “vacation from hell”)*

- **Poor Man’s experiment**
 - *Non-parametric matching (Jaffe et al. 1993; Thompson & Fox-Kean 2004)*
 - *Parametric matching (Azoulay et al. 2009)*

- **No experiment**
 - *Insider econometrics (Lazear 2000; Ichniowski & Shaw, various papers)*

Leverage Signs

- ***The parent/sibling test***
- ***The graphical test***
 - *Source of variation*
 - *Main effect*
- ***The design-to-method ratio test***

Almond et al. (QJE 2009) Chernobyl's Subclinical Legacy

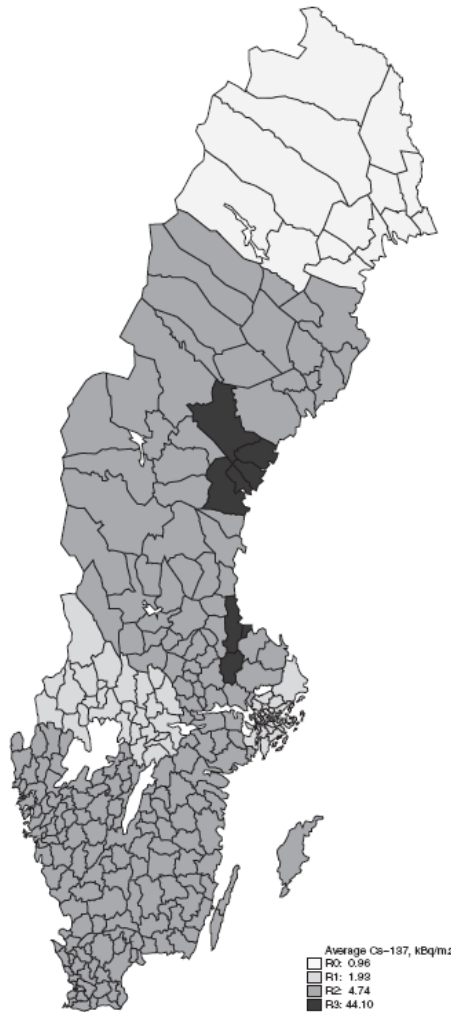


FIGURE III
Cesium-137 Ground Deposition in kBq/m² by Area (cf. Table I)

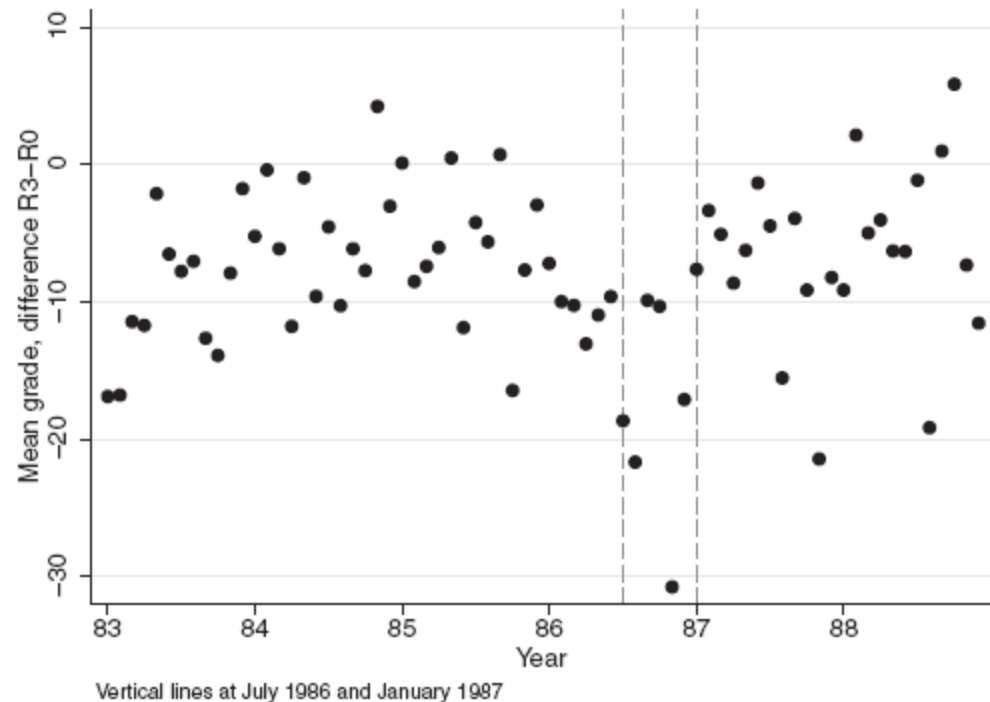
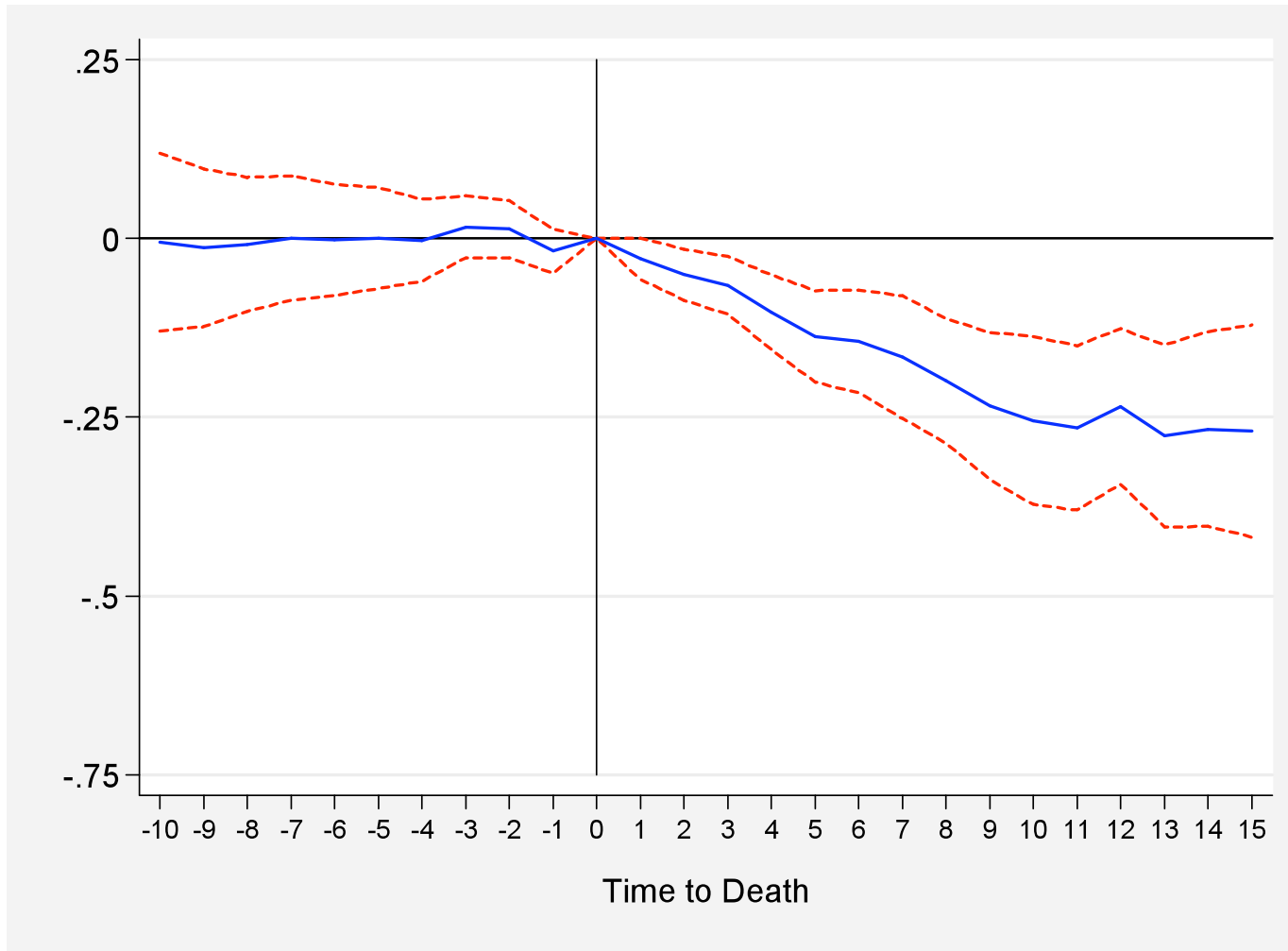


FIGURE V
Difference in Mean Grade Sums by Calendar Month of Birth: R3 (Eight Most Exposed Municipalities) Relative to R0 ("Norrbotten")

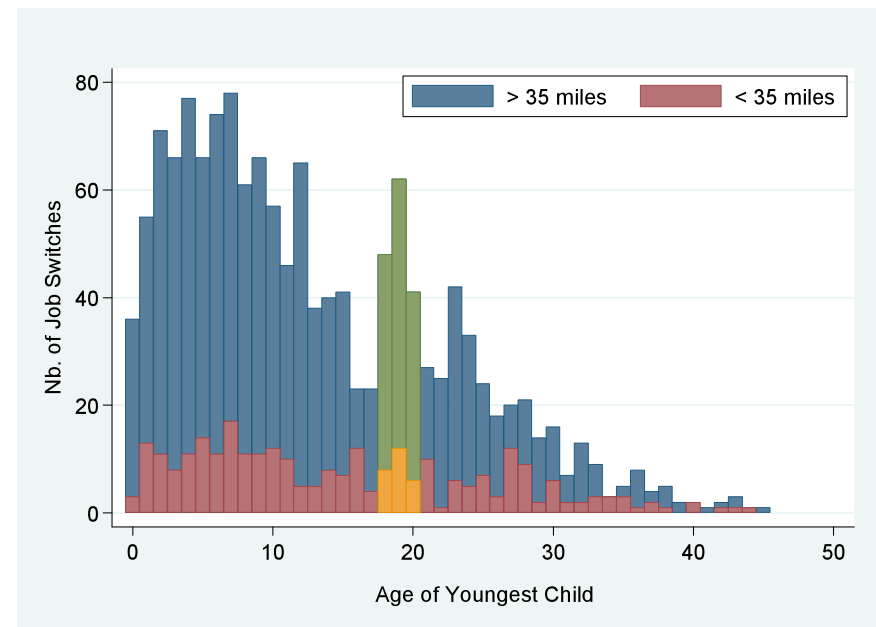
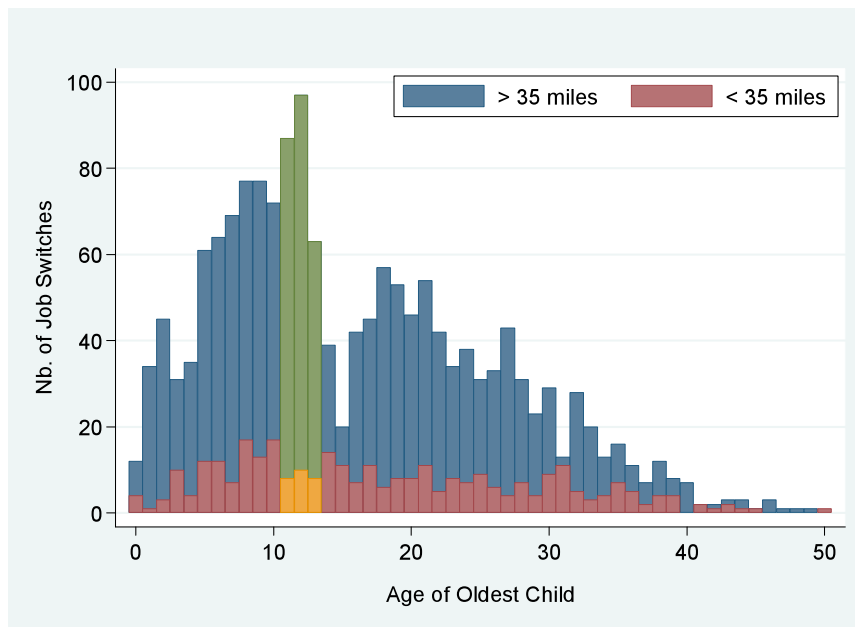
Azoulay et al. (QJE 2010)

The Importance of Being Alive



Azoulay et al.

Number of Job Switches for 3,500 “Superstars of Medicine”



Leverage Etiquette

- **Every method for causal inference in observational data relies on untestable assumptions; make them more plausible**
 - *RCTs: test that randomization was actually successful*
 - *Diff-in-Diffs: check the absence of pre-intervention trends*
 - *RD Design: check the absence of discontinuity*
 - *in the distribution of exogenous covariates around the threshold*
 - *in the distribution of the outcome variable in irrelevant subsamples*
 - *IV: does the effect disappear when the instrument shifts irrelevant margins?*
 - *Matching: test that propensity-score weighting balances “unused observables”*

The Pain of Leverlessness

- ***“Not Even Wrong”***
 - *Fishing expeditions and the n-1 problem*

- ***Econometrics as ceremony or obfuscation***
 - *Implausible instruments*
 - *Heckits without exclusion restrictions*

Why is leverage increasing?

- ***Better and more data***
- ***Pressures from referees and editors***
 - *Optimistic view: reflects fundamentals; design and data availability are complements*
 - *Cynical view: a passing fad*

Leverage skeptics

- **Design-based research leads to boring papers**
 - *Speak for yourself, Kemo Sabe!*
- **Design-based papers lack external validity**
 - *So do designless papers...*

The Leverage Frontier

