

The “Green” Geography: Corporate Environmental Policies and Local Institutional Investors

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Broad Overview

- Peer effects (clustering of environmental policies) (Tables 2, 3)
 - Discuss endogeneity and identification challenges
 - The authors could try to address some of the issues or tone down this part of the paper
- Local norms (Tables 4-6, Table 9, Panel A)
 - Discuss alternative measurement (community engagement, volunteering, sociability)
 - Touch upon endogeneity
- Local investors (Tables 7-8)
 - Discuss ways of enriching this part of the paper
- Value implications (Table 9, Panel B)
 - Briefly discuss Q measurement (time permitting)

Discussing Peer Effects

- Relation between Env^* and $Area_Env^*$ ratings (Table 3; slides 7-8)
- Classic instance of the reflection problem (Manski, 1993)

$$y = \alpha + \beta E(y|x) + E(z|x)' \gamma + z' \eta + u, \quad E(u|x, z) = x' \delta$$

Outcome:
A firm's Env^*

$Area_Env^*$

Area to which the firm belongs

Observable exogenous (firm) characteristics

Unobservable (firm) characteristics

- Regress y on x and z :

$$E(y|x, z) = \alpha + \beta E(y|x) + E(z|x)' \gamma + x' \delta + z' \eta.$$

$\beta \neq 0$... **endogenous effect**
a firm's Env^* varies with $E(y|x) = Area_Env^*$, the mean of Env^* among firms in area x

$\eta \neq 0$... **direct effect** of observable (firm) characteristics z on Env^*

$\gamma \neq 0$... **exogenous effect**
a firm's Env^* varies with $E(z|x)$, the mean of the exogenous variables z among the firms in area x

$\delta \neq 0$... **correlated effects**
firms in area x behave similarly because they have similar unobserved individual characteristics u or face similar environments

Discussing Peer Effects

- (a) **endogenous effects** ... the propensity of a firm to behave in a certain way varies with the behavior of the firms HQd in the same area
- (b) **exogenous (contextual) effects** ... the propensity of a firm to behave in a certain way varies with the exogenous characteristics of the group
- (c) **correlated effects** ... firms HQd in the same area behave similarly (similar firm characteristics or face similar institutional/regulatory/green environments)

- Regress y on x and z :

$$E(y | x, z) = \alpha + \beta E(y | x) + E(z | x)' \gamma + x' \delta + z' \eta.$$

$\beta \neq 0$... **endogenous effect**

a firm's Env^* varies with $E(y | x) = Area_Env^*$, the mean of Env^* among firms in area x

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firms in area x behave similarly because they have similar unobserved individual characteristics u or face similar environments

Discussing Peer Effects

- Integrate both sides wrt z :

$$E(y|x) = \alpha + \beta E(y|x) + E(z|x)'\gamma + x'\delta + E(z|x)'\eta.$$

- Reflection problem: Parameters $\alpha, \beta, \gamma, \delta$ not identifiable:

$$E(y|x) = \alpha/(1 - \beta) + E(z|x)'(\gamma + \eta)/(1 - \beta) + x'\delta/(1 - \beta).$$

- Cannot disentangle endogenous, exogenous, and correlated effects
- Can get composite effects: substitute the above into the earlier equation (the four regressors need to be linearly independent):

$$E(y|x, z) = \alpha/(1 - \beta) + E(z|x)'[(\gamma + \beta\eta)/(1 - \beta)] + x'\delta/(1 - \beta) + z'\eta.$$

- If $(\gamma + \beta\eta)/(1 - \beta) \neq 0$, at least one of γ and $\beta\eta$ must be $\neq 0$, so we can tell that there is some kind of social effect, but not exactly what is going on (even this is fragile and depends on $E(z|x)$)

Discussing Peer Effects—IV strategy?

- Looking for a variable that, simultaneously, must satisfy
 - (1) Inclusion restriction:** strong correlation with the endogenous variable *Area_Env**, conditional on other covariates (**strong first stage**)
 - (2) Exclusion restriction:** unlike the original variable *Area_Env**, must be uncorrelated with the error term in the explanatory equation, conditional on other covariates (in plain talk, must affect the dependent variable *Env** only through its effect on *Area_Env**, and in no other way; impossible to prove—must be argued convincingly)



Discussing Peer Effects—IV strategy?

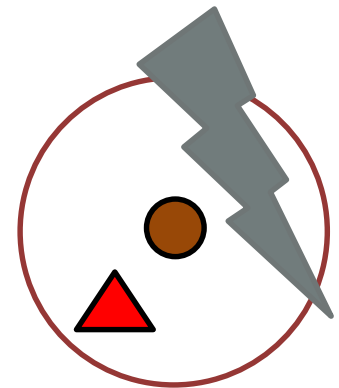
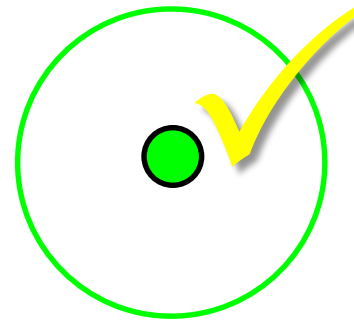
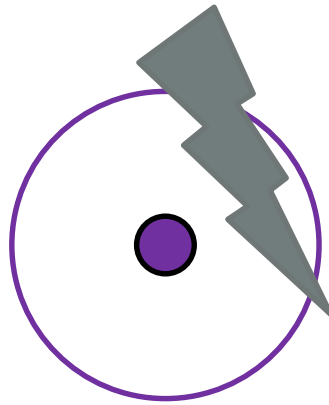
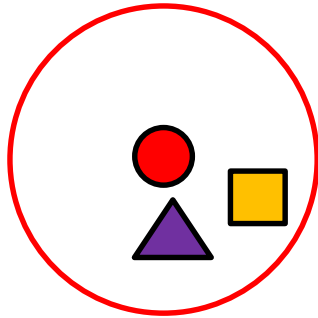
- Firms not randomly assigned to CSAs; correlation between Env^* and $Area_Env^*$ could reflect unobservable influences that induce a spurious correlation even after controlling for observable characteristics
- Instrument for $Area_Env^*$ for firm i HQ's CSA with average Env^* of "sibling(i)" firms that, in a specific sense, do not overlap geographically with the firm's HQ's CSA (but do have facility overlaps in "mutually HQ remote" geographic areas that do not encapsulate the respective HQs)
- Argue convincingly that, whereas Env^* of "distant siblings(i)" and firm i will be related (effects on Env^* of both groups of firms because their facilities are colocated at the "mutually HQ remote" geographic areas), there is no reason why Env^* of firm i should be influenced directly by distant siblings(i) other than through the effects distant siblings(i) and HQneighbors(i) experience at locations distant to HQ of firm i
- Lag the instrument by a year to rule out correlated contemporaneous response across CSAs to new information

Discussing Peer Effects—IV strategy?

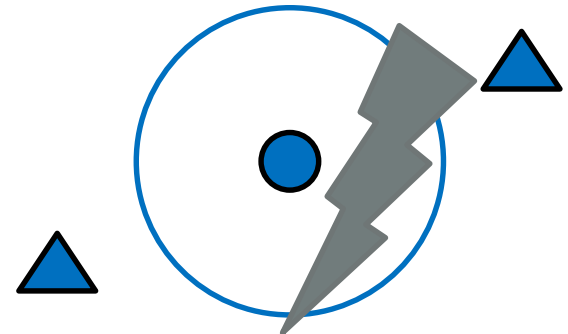
firm i ○

HQneighbor(i) □

distant facility(i) △



Have I chosen poorly or wisely?



Local Norms—Ethical/Engagement Issues

- Corruption conviction rates subject to shifts in resources, priorities, and will to prosecute (extremely low numbers)
- Used in previous literature, rankings aligns with intuition
- Not sure they capture apathy, if that is what you want
- Consider instead various measures of community engagement (volunteering, sociability, etc.)
- Consider also the political landscape at the local/state level
- Consider also political shifts at the federal level
 - The sample period evenly split Bush/Obama

Local Norms—Green Issues, Facilities

- “... local environmental regulations at HQ unlikely to govern (remote) facilities’ practices”
- Not that clear—there is a reason why environmental regulations are tighter at a location!
- Could tease this out
 - Consider the potential presence of activist shareholders
 - There may be sufficient variation across the firms to be able to differentiate toxicity levels at remote plants by how influential activist shareholders are
 - Another channel for monitoring (and punishing) bad behavior coming up (local institutional investors’ trading patterns)
- Some of the same comments as before apply
 - Political landscape at the local/state level
 - Shifts at the federal level

A Polar Bear Cub's Dream...



?



Measure of Strengths and Concerns

- Perhaps walking away from more power and precision?
- Why not difference the strengths/concerns over two consecutive periods along comparable dimension and create a more precise measure?
- This might open the door for a range of analyses you could do to tease out institutional investors' response
- Where are the changes more noticeable/frequent?
 - No strengths vs. some strengths or Δ # strengths ?

GSS Survey

NATENVIR: Categorical (Single)

(I would like to talk with you about some things people think about today. We are faced with many problems in this country, none of which can be solved easily or inexpensively. I'm going to name some of these problems, and for each one I'd like you to tell me whether you think we're spending too much money on it, too little money, or about the right amount.)

Improving and protecting the environment

(... are we spending too much, too little, or about the right amount on Improving and protecting the environment?)

NATMASS: Categorical (Single) ... Mass transportation

NATPARK: Categorical (Single) ... Parks and recreation

NATENRGY: Categorical (Single) ... Developing alternative energy sources

Role of (Local) Institutional Investors

- Institutional investors may drop stocks of companies whose environmental policies are not to their taste
- Sensitivity of that action to levels, changes in environmental indicators
- One approach: Consider stocks held by institutional investors
- Use Cox proportional hazard model to relate institutional investors' propensity to sell the stock to:
 - Its past performance, the “usual” firm characteristics
 - Firm's environmental strengths and concerns, changes in strengths and concerns (cost to improving/deteriorating environmental practices?)
 - HQ area's tastes for green, presence of activist shareholders
 - Stock local/non-local?
 - Interaction of locality with firm environmental characteristics
- Can also do this for toxicity level changes of remote plants (check whether someone is paying attention)

Role of (Local) Institutional Investors

- That analysis is highly relevant in its own right
- Can also use it to study how firms respond to these stimuli:
- Every CSA ... its own estimate of the propensity to punish (run rolling window analyses, pooled across all investors local to the CSA and the way their holdings relate to environmental issues)
- This measures the discerning tastes for environmental issues, expressed as implied probabilities of dropping the company shares in response to environmental issues
- Equipped with these estimates, evaluate the relation between the firms' propensity to change their environmental profile and the perceived tendency to punish misbehavior/reward good behavior
 - Firms with lackluster performance might be more concerned with these issues—integrate performance issues into this
 - Might as well add the instrumented “peer effects”

Discussing Q—Measurement Error

- Challenges and limitations of using Q as the valuation measure routinely acknowledged, but studies vary in their efforts to tackle the related issues
- Useful roadmap: Section 3 in Gompers, Ishii, Metrick (2010)

Issue #1: Measurement error

- Book values of some intangible assets can differ substantially from their “true” replacement cost → problems in the denominator
- Market value of intangible assets can be captured through the market value of common stock → less problematic in the numerator
- Q measurement error does not cause bias, but it inflates standard errors and makes inference more difficult

$$s_{b_i} = \sqrt{\frac{1 - R_{yX}^2}{(1 - R_{x_i X_{-i}}^2) \cdot (N - K - 1)}} \cdot \frac{s_y}{s_{x_i}}$$

Discussing Q—Tackling Measurement Error

- Having standard errors figured out as precisely as possible is important (this is always true!)
- More extensive work on standard errors might lead to more precise inferences about relative magnitudes of some of the effects you uncover and other issues central to this paper
- A few suggestions (see GIM (2010) for further discussion):
 - Measurement errors correlated across industries → adjust (done!)

$$IAQ_{i,t} = Q_{i,t} - VWQ_{industry(i) t}$$

- Address right-skewness of the measurement error (driven by measurement errors in the denominators) in three different ways

Discussing Q—Tackling Measurement Error

- Dealing with right-skewness of the measurement errors:
 1. Use robust, median regression with $IAQ_{i,t}$ as the LHS
 2. Concave transformation $Q' = \log(Q)$; use OLS with IAQ' as the LHS:

$$IAQ'_{i,t} = Q'_{i,t} - VWQ'_{industry(i), t} = \log(Q_{i,t}) - \log(VWQ_{industry(i), t})$$

3. Concave transformation that shifts the bulk of the measurement error into the numerator: $Q'' = -Q^{-1}$; use OLS with IAQ'' as the LHS:

$$IAQ''_{i,t} = Q''_{i,t} - VWQ''_{industry(i), t} = -Q^{-1}_{i,t} - [-VWQ^{-1}_{industry(i), t}]$$

Conclusion

- Very creative and fun paper to read
- Explore more avenues and streamline
- Highly recommended reading
- Looking forward to future revisions and ultimate publication!