

Young, Restless and Creative: Openness to Disruption and Creative Innovations

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Hypotheses

- Economic progress hinges on acceptance/celebration of new ways of doing things
- Younger people in influential positions encourage innovation/change
- *Youthful CEO's promote radical breakthrough innovation by the firm
- Get at these larger issues via an empirical evaluation of *

An Impossible Empirical Task?

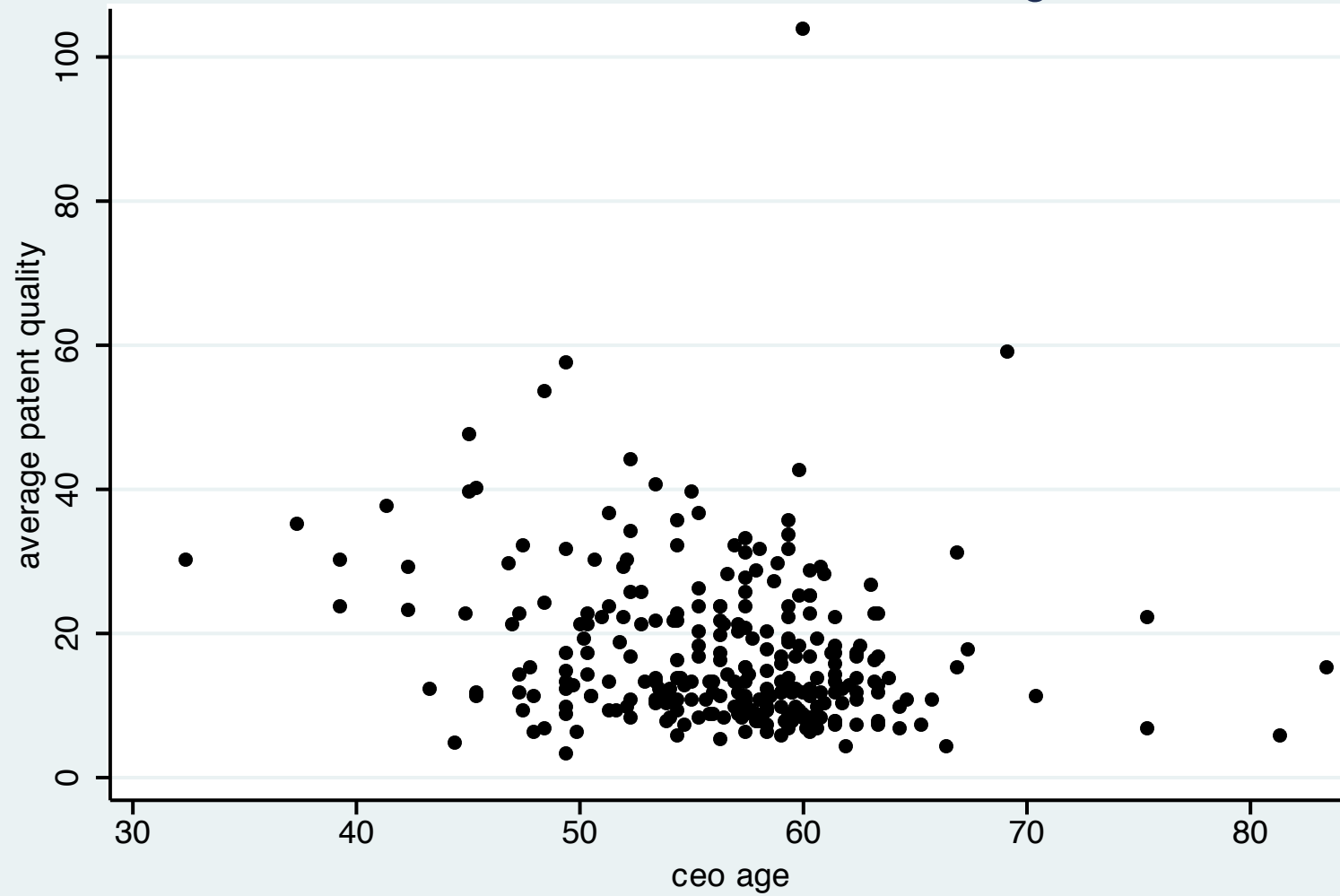
- Age of CEO is one of many factors determining CEO's attitude toward change
- Attitude of CEO is one of many factors determining firm's innovative strategy
- Citations per patent is an imperfect measure of radical innovation
- Correlation of CEO age and radical innovation does not indicate a causal magnitude

Findings

- A year of CEO age is associated about 1/3 less citations per patent (more than a 1% reduction)
- Holds conditional on firm age, which is also associated with fewer citations per patent
- Robust to different measures of radical innovation
- Holds up weakly in the within-firm dimension
- Coefficients more than double, but noisy, in cross-country dimension

Illustrating the Challenge

Radical Innovation and CEO Age



Role of “Motivating” Theory

- Read: “window dressing” prior to the substance ...
- ... in the regression tables
- Yet the theory occupies first 24 pages, and does more than you’d think possible
- If only a motivation, strip it down
- Better yet, use it

Peek at Theory I

- Differentiated products with quality ladders:

$$Y(t) = \frac{1}{1 - \beta} \left(\int_C q_j(t)^\beta k_j(t)^{1-\beta} dj \right) L^\beta$$

- Quality ladder dynamics:

- Radical innovations arrive to a high type firm (with manager age a) at rate $\psi + \Lambda(\bar{q}_{t-a}/\bar{q}_t)$:

$$q_j^0 = (1 + \eta_0)q_j$$

- The n 'th incremental innovation ($\kappa = 1$) arrives to high and low-type firms at rate ξ :

$$q_j^n = q_j^{n-1} + \bar{q}_t \eta \alpha^n$$

Peek at Theory II

- A firm is composed of a set of product lines
- Value of product line of low type (ignore Markov transitions between types):

$$\left[r + \tau - \frac{\dot{V}_L}{V_L} \right] V_L(q_j, n) = \Pi_L^I$$

$$\Pi_L^I = \max_a \left\{ \pi q_j + \bar{q}_t f(a) - w_{a,t} \right\} + \xi \left[V_L(q_j + \eta_{n+1}, n + 1) - V_L(q_j, n) \right]$$

Peek at Theory III

- High type must also choose between radical and incremental

$$\left[r + \tau - \frac{\dot{V}_H}{V_H} \right] V_H(q_j, n) = \max\{\Pi_H^I, \Pi_H^R\} + \psi EV_H(\bar{q}_t)$$

$$\Pi_H^R = \max_a \left\{ \pi q_j + \bar{q}_t f(a) - w_{a,t} + \Lambda(\bar{q}_{t-a}/\bar{q}_t) EV_H(\bar{q}_t) \right\}$$

- Result: high-type firms seeking radical innovations hire younger managers

Role of Theory in Combination with Data

- Theory is rich enough to illustrate:
 1. Sources of the error term
 2. Two-way causation between age and radical innovation
 3. Interpretation of between-firm vs. within-firm relationships
 4. Interpretation of country-level relationships
 5. Other relationships to investigate
- More generally, a structure to support rather tenuous empirical findings

A Step in the Right Direction

- Section 4.4 on “Indirect Inference” is beginning to combine theory and data
- Preliminary finding: empirical relationship largely reflects sorting ...
- ... of younger managers into more innovative firms
- Causal effect of age contributes only a bit
- Now its starting to get interesting.

Conclusion

- Good start on a very challenging issue
- You're young: don't be incremental
- Be radical!