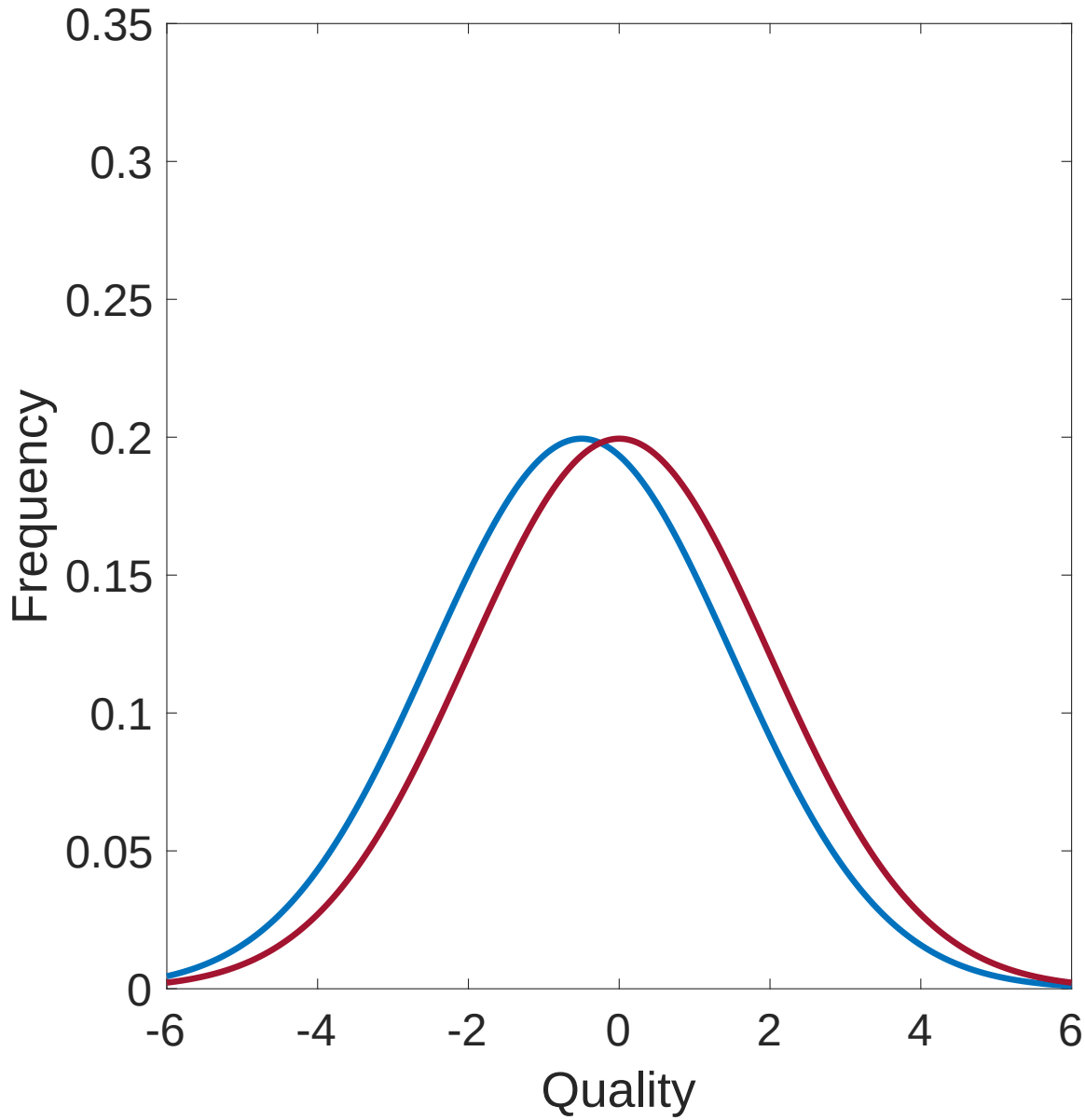
Buying the Lottery in Bad Times: Why Do Firms Hire Outside CEOs?

Andrew Capron
University of North Carolina at Chapel Hill

Barton H. Hamilton
Olin Business School, Washington University in St. Louis

Andrés Hincapié
University of North Carolina at Chapel Hill

Noah Lyman
University of North Carolina at Chapel Hill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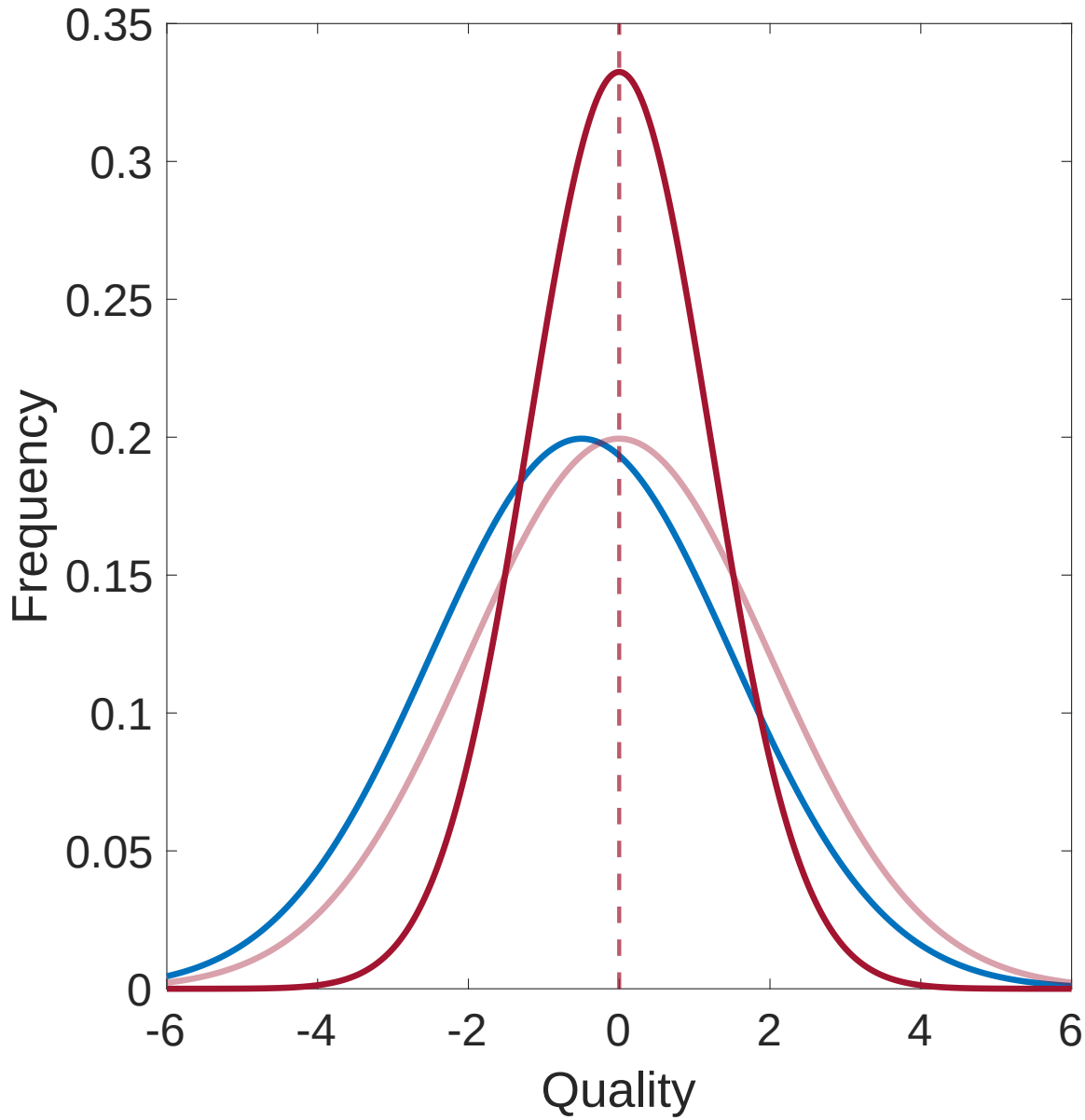
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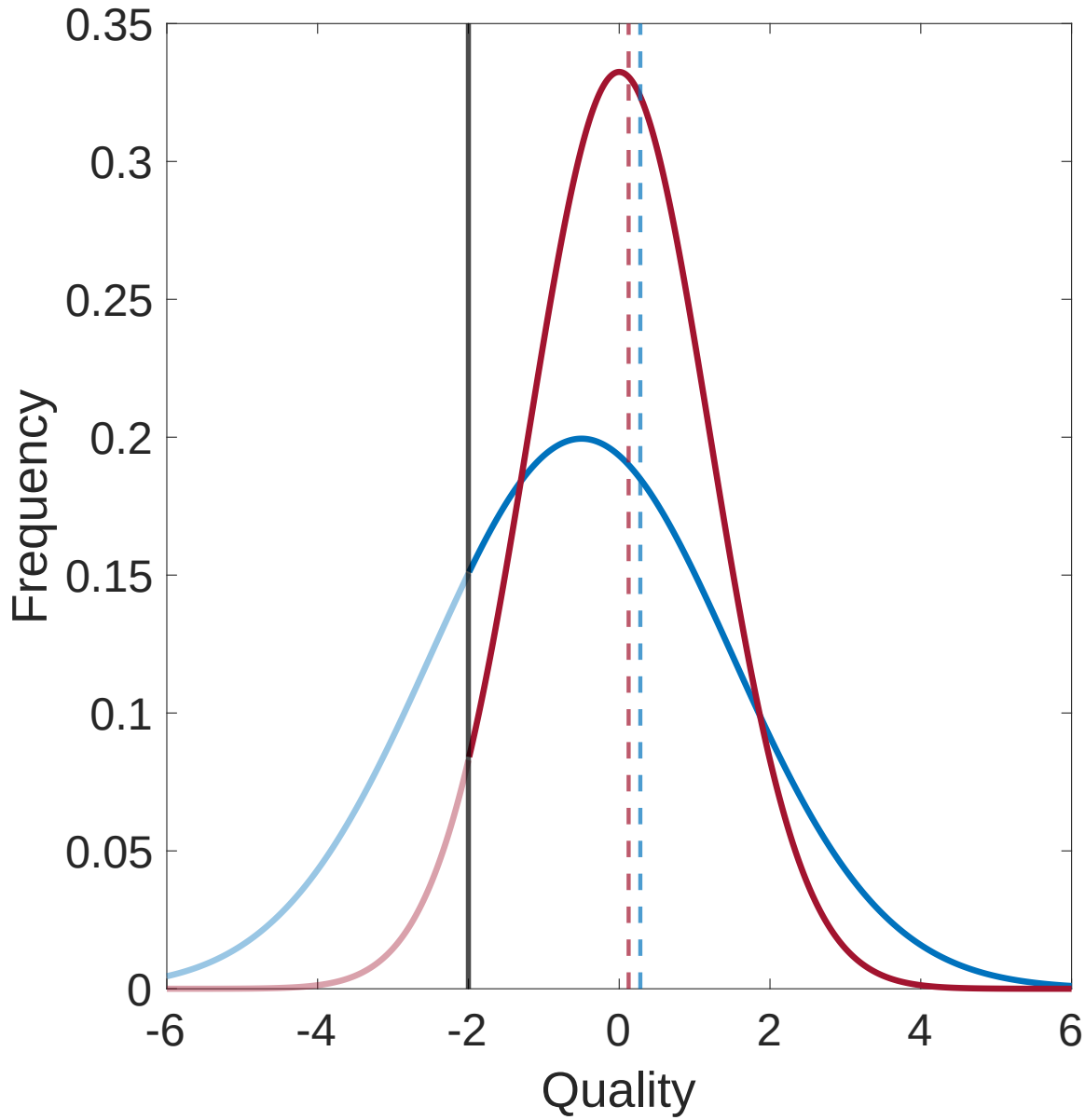
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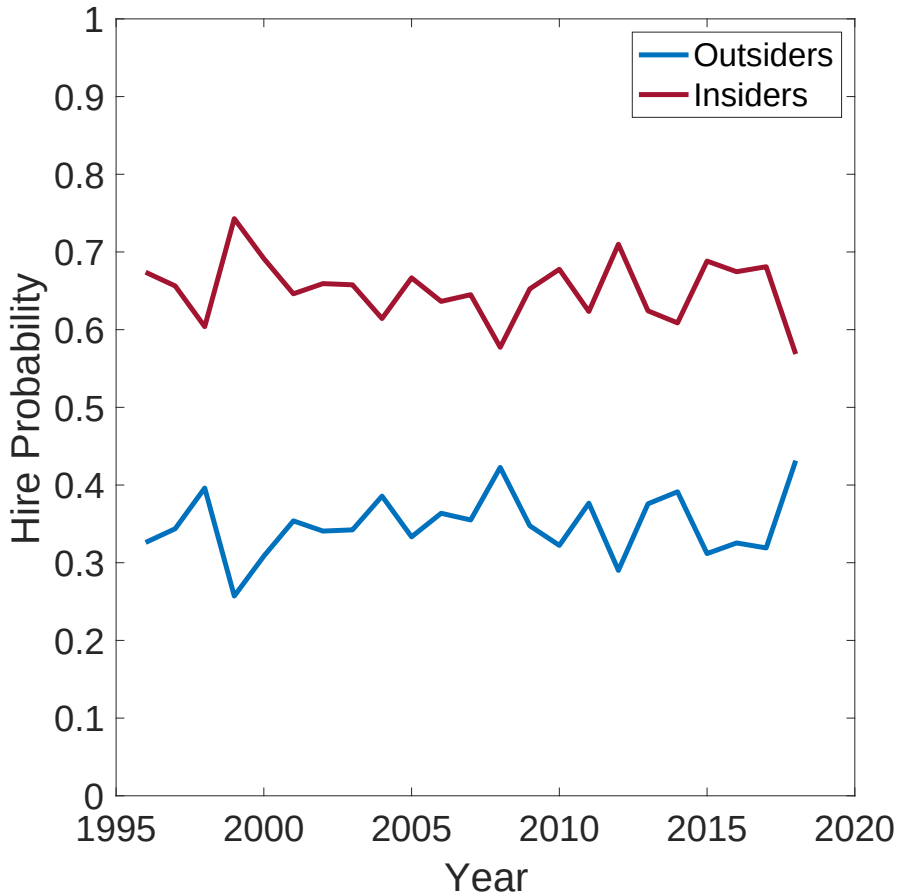
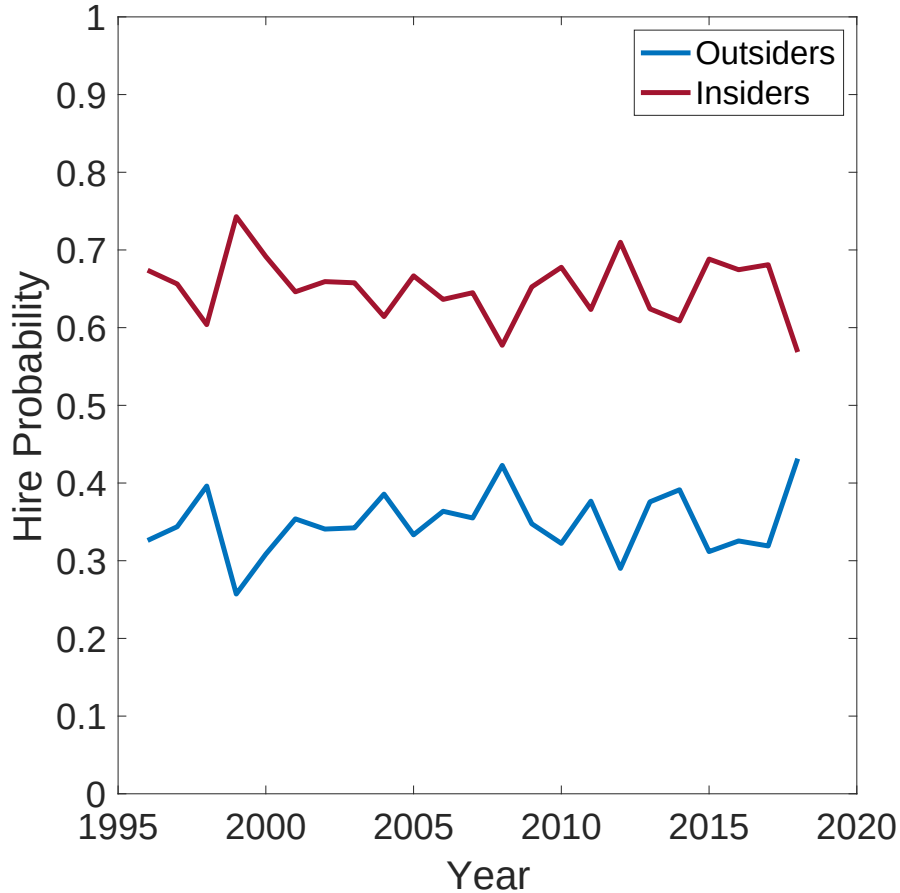


→ However, we see that most firms do not choose the high variance candidate (i.e., the outsider)



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→ **Research Question:** What explains why firms choose to promote from within vs. hire from outside the firm?

- Using a matched CEO-firm panel, we estimate a dynamic model of CEO turnover (Jovanovic (1979), Taylor (2010)):
  - Boards hire CEOs from within or outside the firm
  - Boards face more uncertainty about outsider match quality
  - Boards learn about CEO quality over time
  - CEO replacement is costly
- Through counterfactual analyses, we deduce the main determinants of firm hiring decisions
- Counterfactuals to consider:
  1. Equate insider/outsider information and/or match quality
  2. Eliminate firm preferences over CEO type
  3. Eliminate CEO firing costs
  4. Removing all these mechanisms simultaneously

Data

- We construct a panel of North American publicly traded firms between 1996 and 2019 using three data sources:
  - **CEO-level information:** Execucomp
  - **Firm-level information:** Compustat
  - **Turnover Data**: classifies turnover as forced or voluntary (Peters and Wagner, 2014; Jenter and Kanaan; 2015)
- Final sample consists of $\approx$ 38K observations with 3.2K distinct firms and 6.3K CEOs (6.5K CEO spells)
  - $\approx$ 39% of CEO appointments classified as outsiders
  - $\approx$ 25% of turnover instances classified as forced

CEO Classification (Parrino (1997)):

- Insiders - (61% of CEO spells)
  - > 1 years of firm-specific experience at time of hire
- Outsiders - (39% of CEO spells)
  - $\leqslant 1$ year of firm-specific experience at time of hire

Performance Measure:

- We measure firm performance using their industry-adjusted return on assets (IA-ROA):

$$\frac{\textit{earnings before depreciation in } t}{\textit{midpoint of total assets in } t \textit{ and } t-1} - \alpha_t^{ind}$$

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2. Greater upside among outsiders
3. Likelihood of hiring outsider decreases with prior performance

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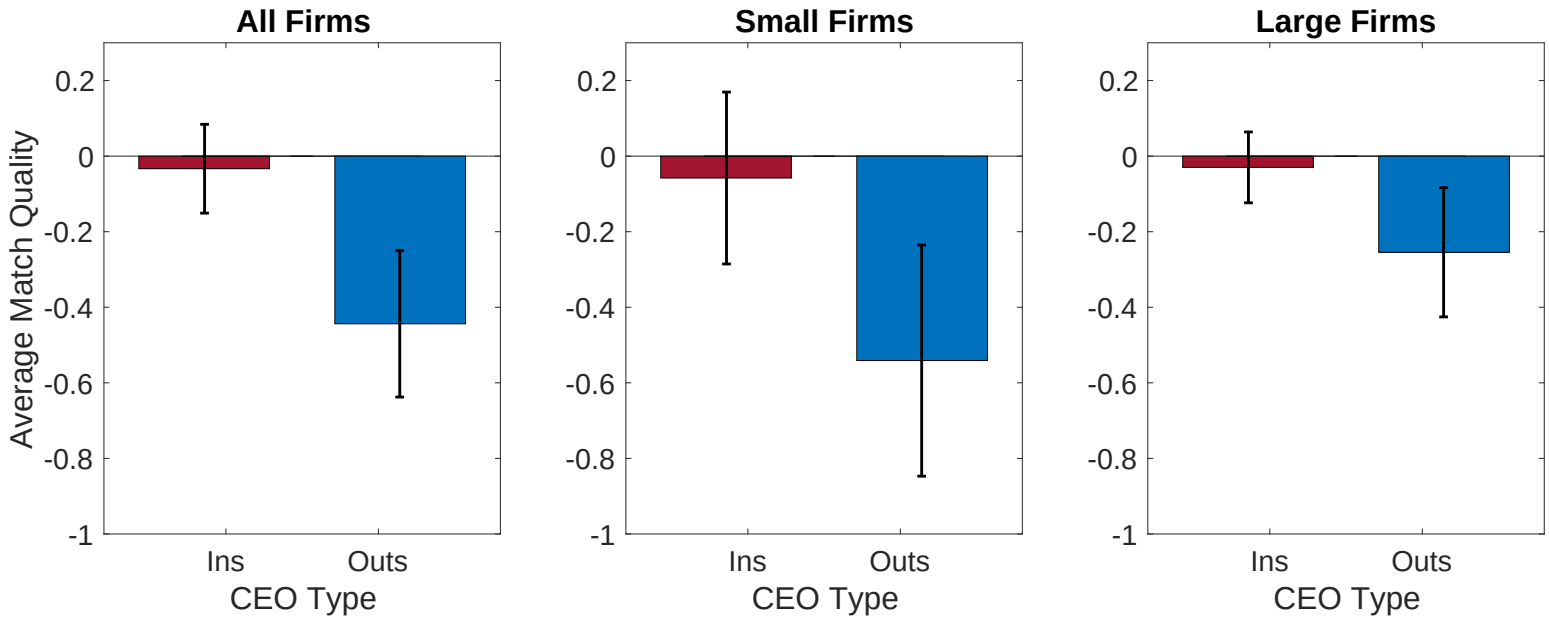
- To compare insider and outsider performance, we create a proxy of CEO quality
- First, we estimate the equation:

$$IA\text{-}ROA_{ijt} = \rho\, IA\text{-}ROA_{ijt-1} + \beta X_{ijt} + \epsilon_{ijt} \qquad (1)$$

- X_{ijt} is a vector of firm and CEO characteristics
  - Assets, tenure, gender, compensation; industry and year FEs
- For each CEO-firm match ij, we average the fitted residuals obtained from Equation (1):

$$\tilde{\theta}_{ij} \equiv \frac{1}{s_{ij}} \sum_{\tau_{ij}=1}^{s_{ij}} \hat{\epsilon}_{ijt} \cdot \mathbf{1}\{ij' = ij\}$$



- On average, insiders exhibit significantly higher residual performance than outsiders (across all firm sizes)
- However, residual performance is highly variable, particularly for outsiders

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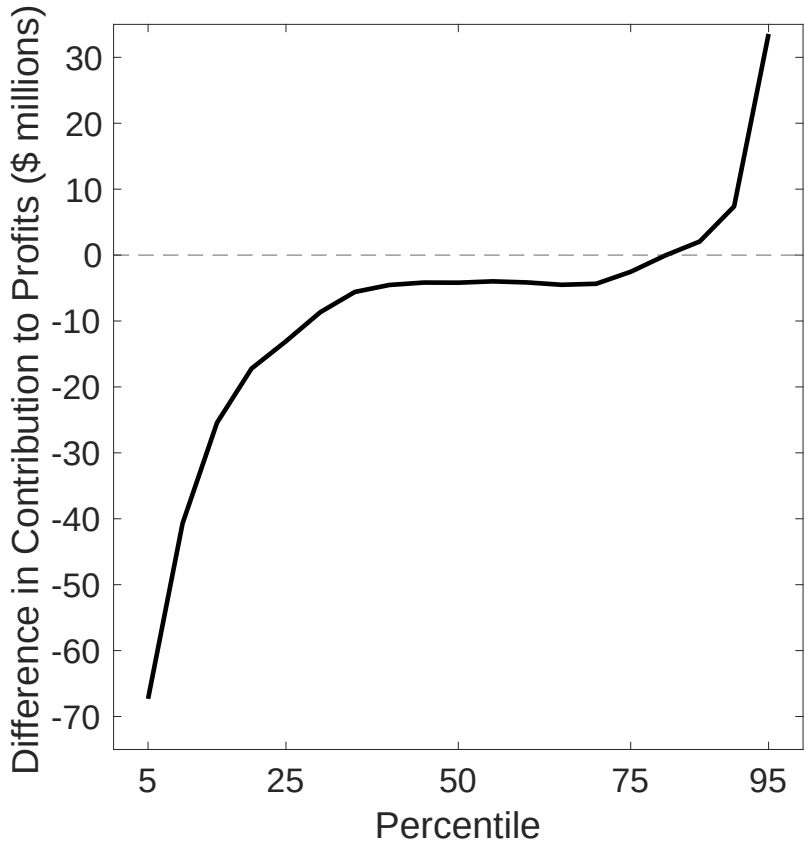

- $\tilde{\theta}_{ij}$ distribution for outsiders relative to insiders
- Bad outsiders are worse than bad insiders, but exceptional outsiders (80th+ pctile) are better than exceptional insiders
  - For the median-sized firm, a 95th pctile outsider generates +$33.5M in annual (adjusted) profits than a 95th pctile insider

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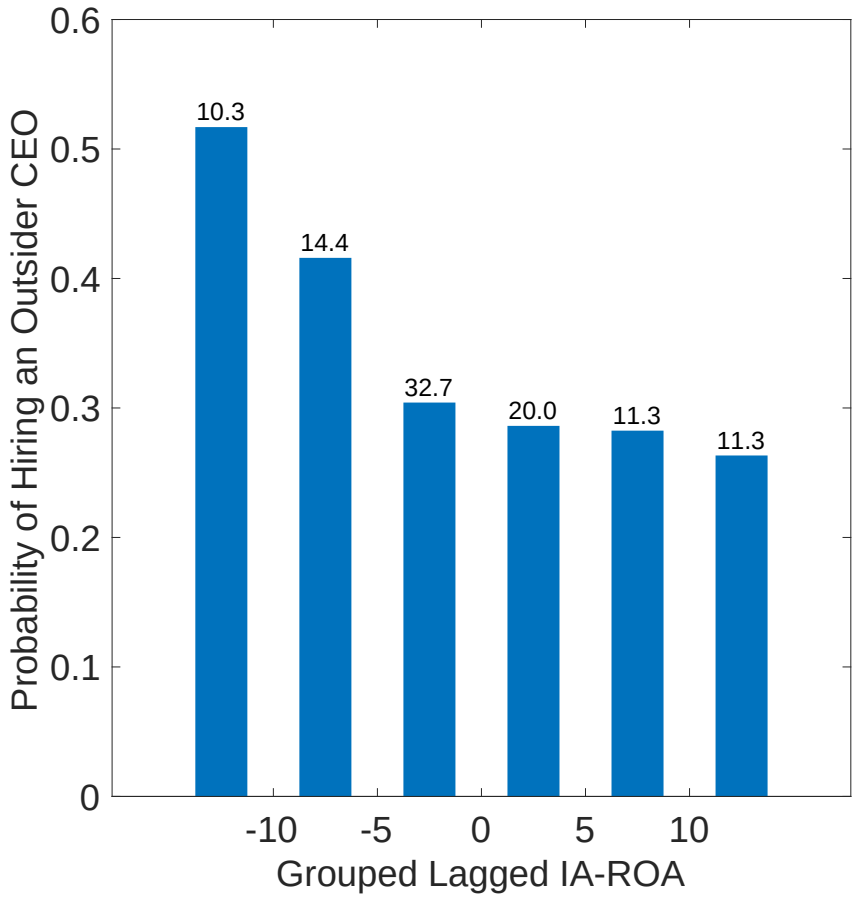


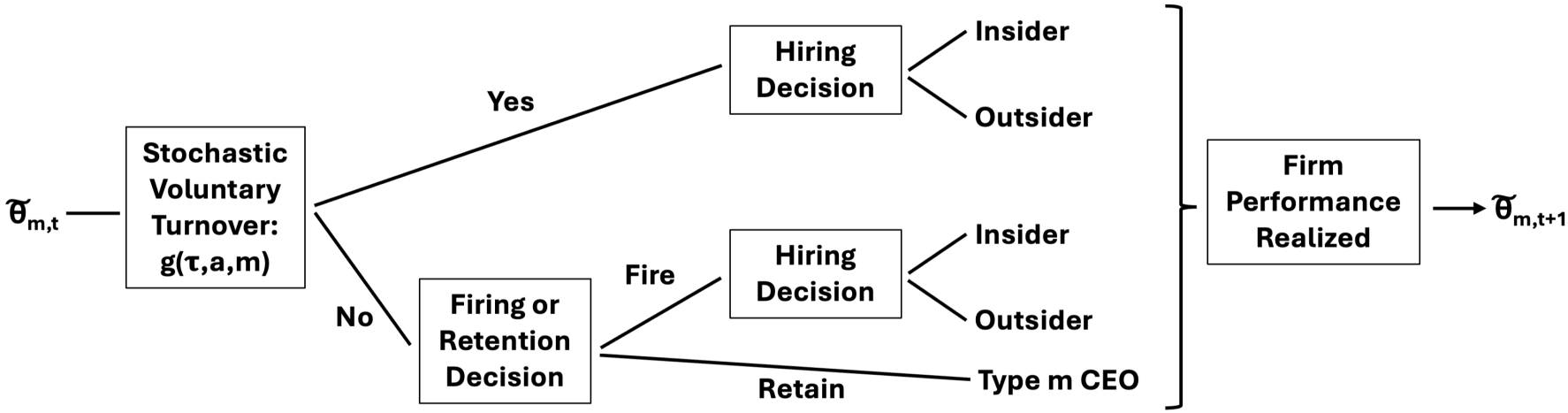
- Firms are more likely to hire outside when performance is poor
- Firms may seek strategic change in bad times through a higher-variance gamble
  - Boeker & Goodstein (1993), Parrino (1997), Chen & Hambrick (2012)

- On average, insiders outperform outsiders
- However, outsider performance exhibits fatter tails
  - Hiring outside $\rightarrow$ choosing risky lottery
- Gambling with outside hires is especially prevalent when prior performance is low
- However, our descriptive results do not control for selection
- To make sense of these empirical facts and control for selection, we estimate a dynamic model of CEO turnover

Model

- Board of directors make CEO hiring and firing decisions on firm's behalf
- Board's decision is impacted by:
  1. Superior information about insider match quality
  2. Differing insider and outsider average match quality
  3. Hiring preferences that may vary with firm performance
  4. Monetary cost of CEO turnover
  5. Non-pecuniary cost of firing
  6. Persistence of firm profits
- We abstract away from board composition, as empirical patterns suggest this feature is fairly constant over time

▸ Board Composition



- The model can be broken down into four stages
- CEOs have four characteristics:
  - Type - $m_{ij} \in \{O, I\}$
  - Age - $a_{ijt} \in \mathbb{Z}_+$
  - Tenure - $\tau_{ijt} \in \mathbb{Z}_+$
  - Type-specific match quality - $\theta_{ij} \sim N(\mu_{\theta_m}, \sigma^2_\theta)$

- Firm profitability has three components:

$$Y_{ijt} = \iota_{it} - (c \times \mathbf{1}[Turnover]) + y_{ijt} \tag{2}$$

- ι_{it} is an exogenous industry trend

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- $\boldsymbol{c}$ is the monetary cost of CEO replacement
  - Measured as a constant fraction of firm assets
  - Accounts for the cost of executive search, severance, and structural disruptions to business operations

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$$Y_{ijt} = \iota_{it} - (c \times \mathbf{1}[Turnover]) + \boldsymbol{y_{ijt}} \tag{2}$$

- ι_{it} is an exogenous industry trend
- c is the monetary cost of CEO replacement
- $\boldsymbol{y_{ijt}}$ is firm-specific profitability given by:

$$y_{ijt} = y_{ijt-1} + \rho(\theta_{ij} - y_{ijt-1}) + \eta_{ijt} \tag{3}$$

  - y_{ijt} mean reverts around CEO match quality θ_{ij}
  - $\eta_{ijt} \sim N(0, \sigma^2_\eta)$ is an idiosyncratic shock

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- The board's prior over the insider is then given by:

$$\theta_{Ijt} \sim N\left(\frac{\sigma_s^2 \mu_{\theta_I} + \sigma_\theta^2 s_{ijt}}{\sigma_s^2 + \sigma_\theta^2}, \frac{\sigma_s^2 \sigma_\theta^2}{\sigma_s^2 + \sigma_\theta^2}\right)$$

where importantly $\sigma_\theta^2 > \frac{\sigma_s^2 \sigma_\theta^2}{\sigma_s^2 + \sigma_\theta^2}$, leading to less uncertainty about insider quality

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- The board uses this new information (i.e., ξ_{ijt}, σ^2_η) to update beliefs via Bayes' Rule

- Boards are risk-neutral with flow preference:

$$u_{ijt} = b_i\Big(Y_{ijt} + (\gamma(y_{ijt-1}) \times \mathbf{1}[\textit{Hire outsider}]) - (\pi \times \mathbf{1}[\textit{Fire CEO}])\Big)$$

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- $\gamma(\boldsymbol{y_{it-1}})$ captures the boards' "preference for change,":

$$\gamma(y_{ijt-1}) = \gamma_1 + \gamma_2 y_{ijt-1}$$

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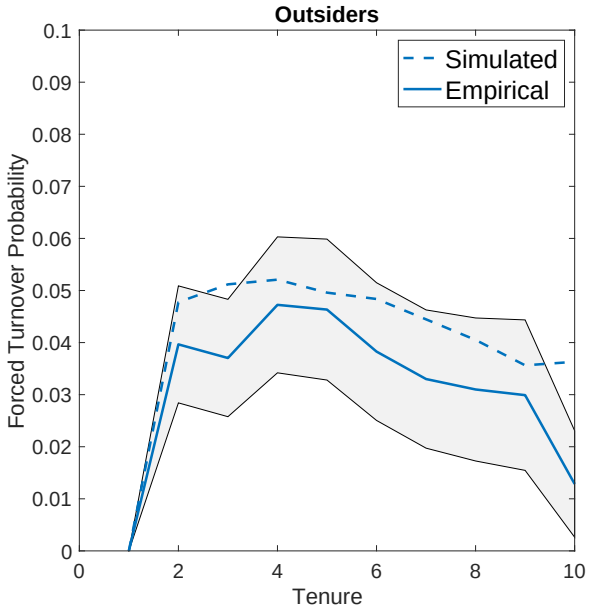
- $\boldsymbol{\pi}$ captures boards' non-pecuniary cost of firing a CEO
  - CEO entrenchment (Taylor, 2010; Lyman, 2023)

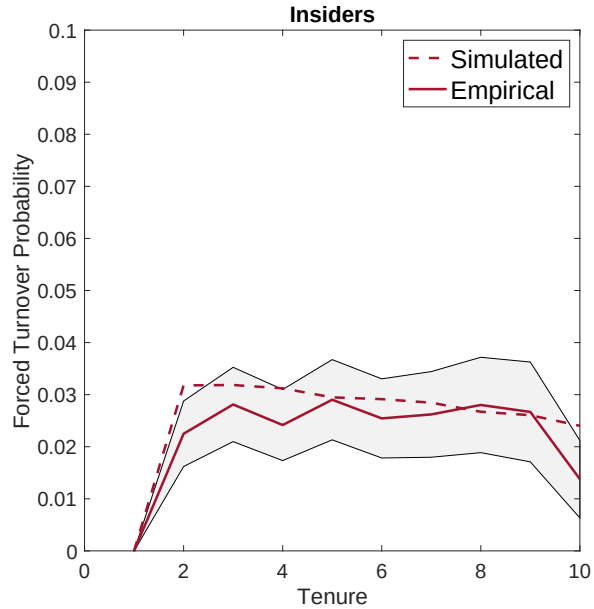
▸ More on the Board's Problem

Estimation
&
Results

- We estimate the model using Simulated Method of Moments
- Match 27 moments to recover 17 model parameters
- Slight over-prediction of termination in second year of tenure but replicates well the low rates of CEO turnover and heterogeneity in outsider hiring across prior performance

▸ Identification


Outsiders
Simulated
Empirical
Forced Turnover Probability
Tenure
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
2
4
6
8
10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Tenure
0.1
0.09
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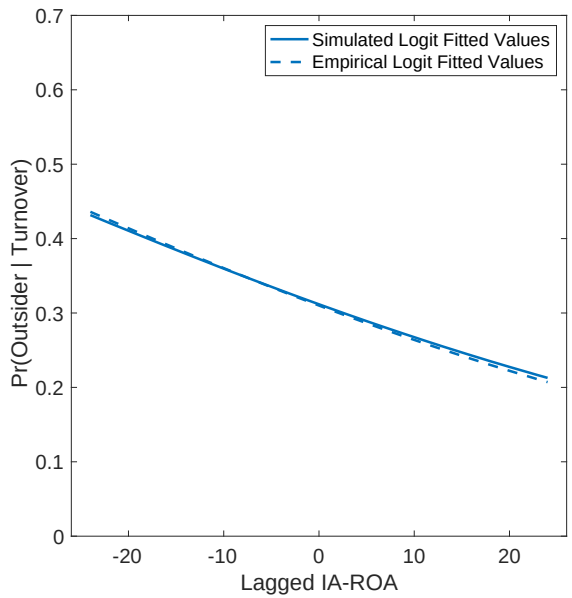
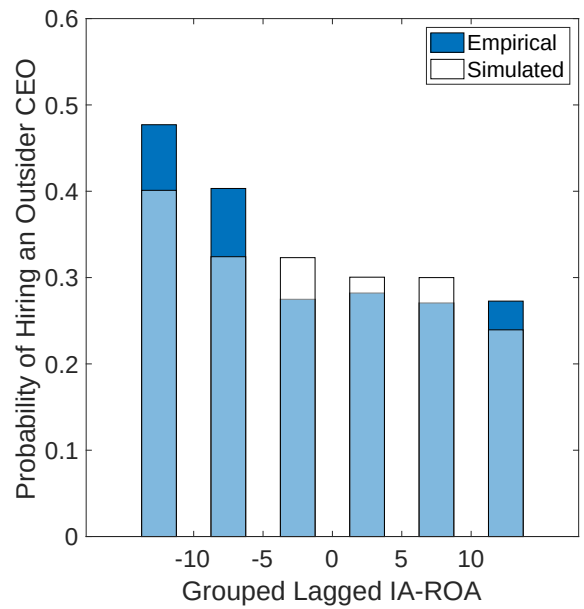

Simulated Logit Fitted Values
Empirical Logit Fitted Values
Pr(Outsider | Turnover)
Lagged IA-ROA
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-20
-10
0
10
20


Empirical
Simulated
Probability of Hiring an Outsider CEO
Grouped Lagged IA-ROA
0.6
0.5
0.4
0.3
0.2
0.1
0
-10
-5
0
5
10

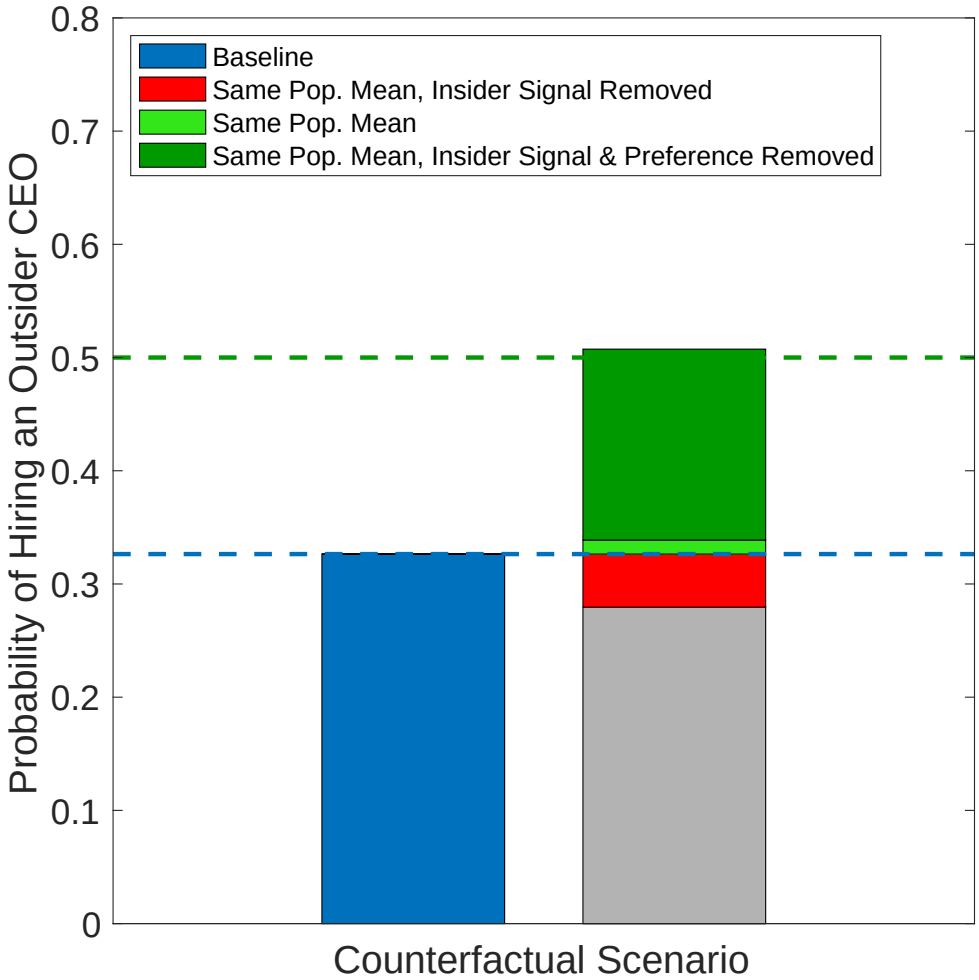
Structural Estimates

CEO Ability				*Profitability*			*Utility*		
μ_{θ_O}	μ_{θ_I}	σ^2_θ	σ^2_s	σ^2_η	ρ	c	π	γ_1	γ_2
-0.337	-0.303	0.860	0.765	40.93	0.204	0.664	4.066	-1.005	-0.004
(0.118)	(0.060)	(0.135)	(0.152)	(0.295)	(0.008)	(0.210)	(0.177)	(0.187)	(0.012)

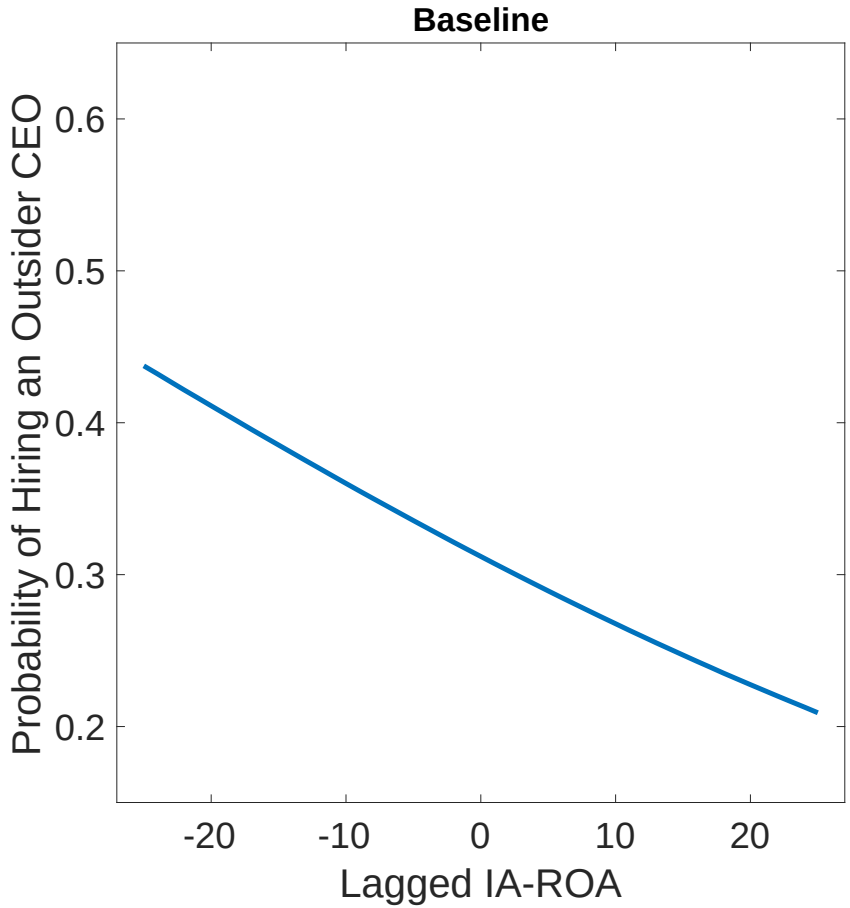
- Outsiders are worse on average, but not by much
- After controlling for dynamic selection, we see (slightly) more upside associated with outside hires
  - 95^{th} percentile outsider generates **$13.3 million** more in yearly (adjusted) profits than 95^{th} percentile insider (for median firm)
- Large & significant γ_1 but small & insignificant γ_2
  - Baseline preference for insiders does not vary systematically with prior performance
- Effective cost of firing is **$114 million** (for median-sized firm)
  - Gambling with an outsider can be extremely costly

Counterfactuals

Change in Average Firm Hiring Decisions



Change in Firm Hiring Decisions Across Prior Performance



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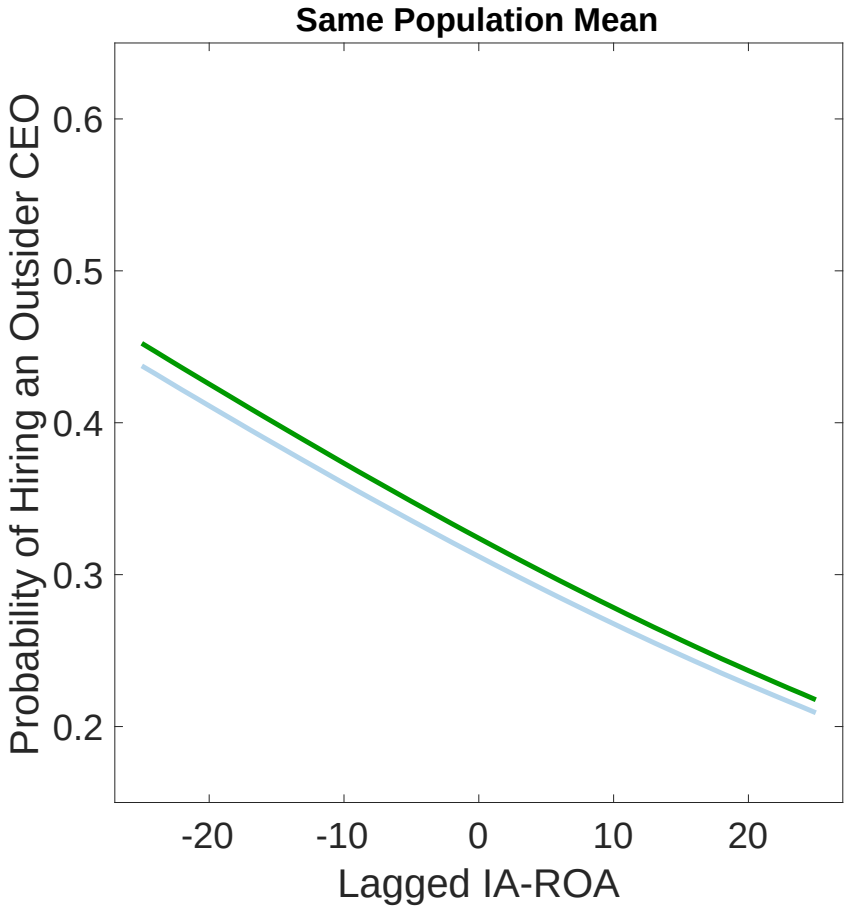

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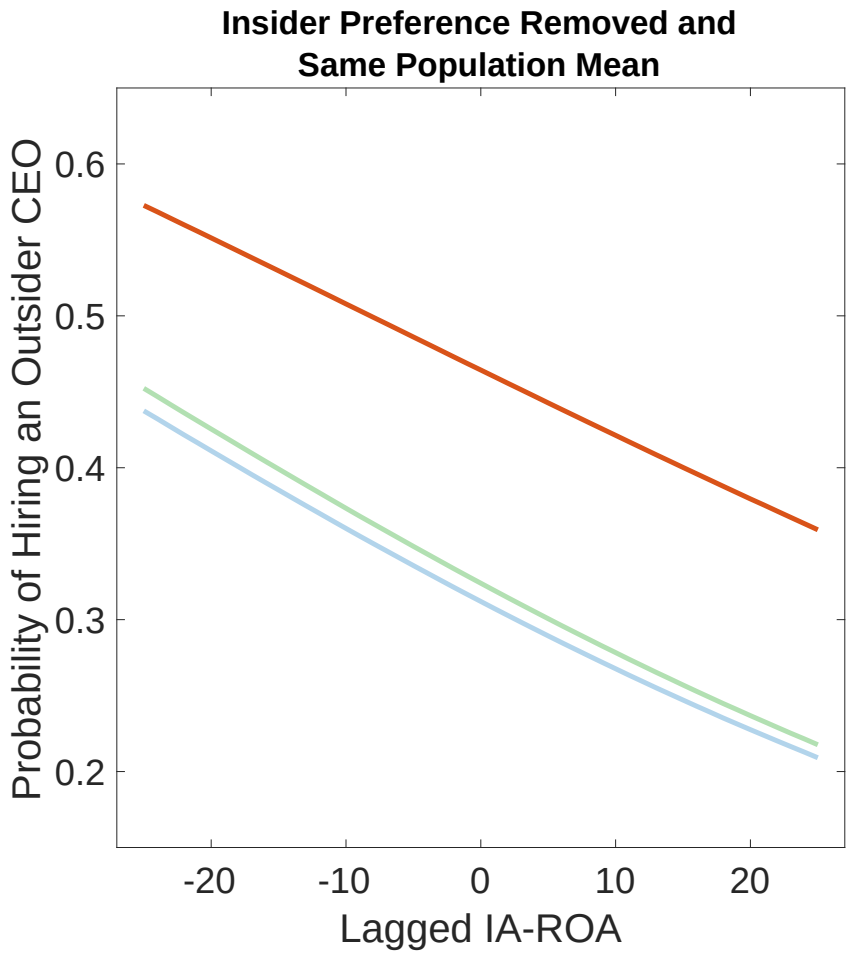

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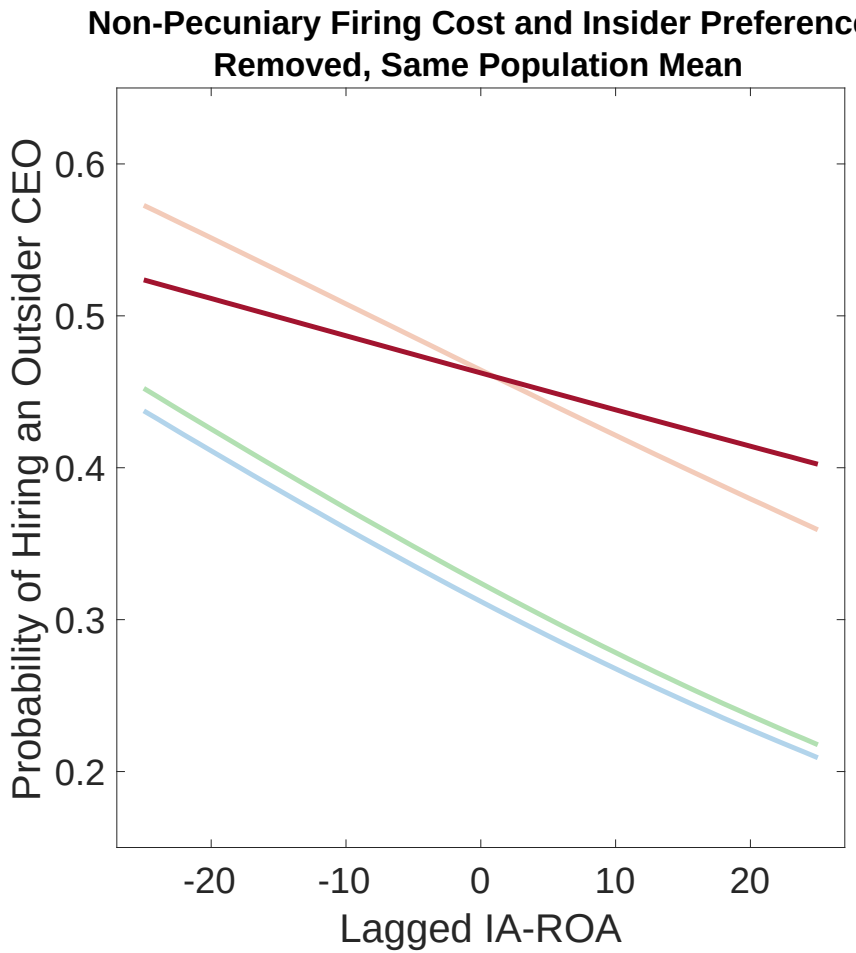

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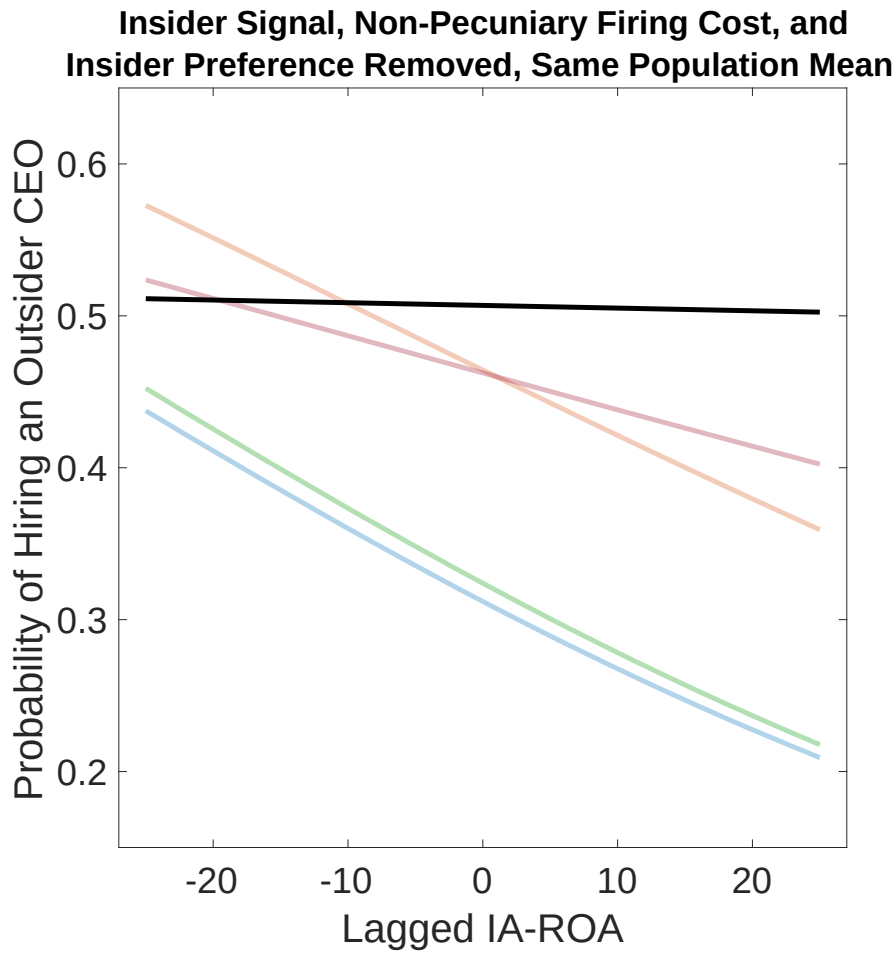

- We estimate a dynamic model of CEO turnover to make sense of several notable empirical patterns
  - Insiders tend to outperform outsiders
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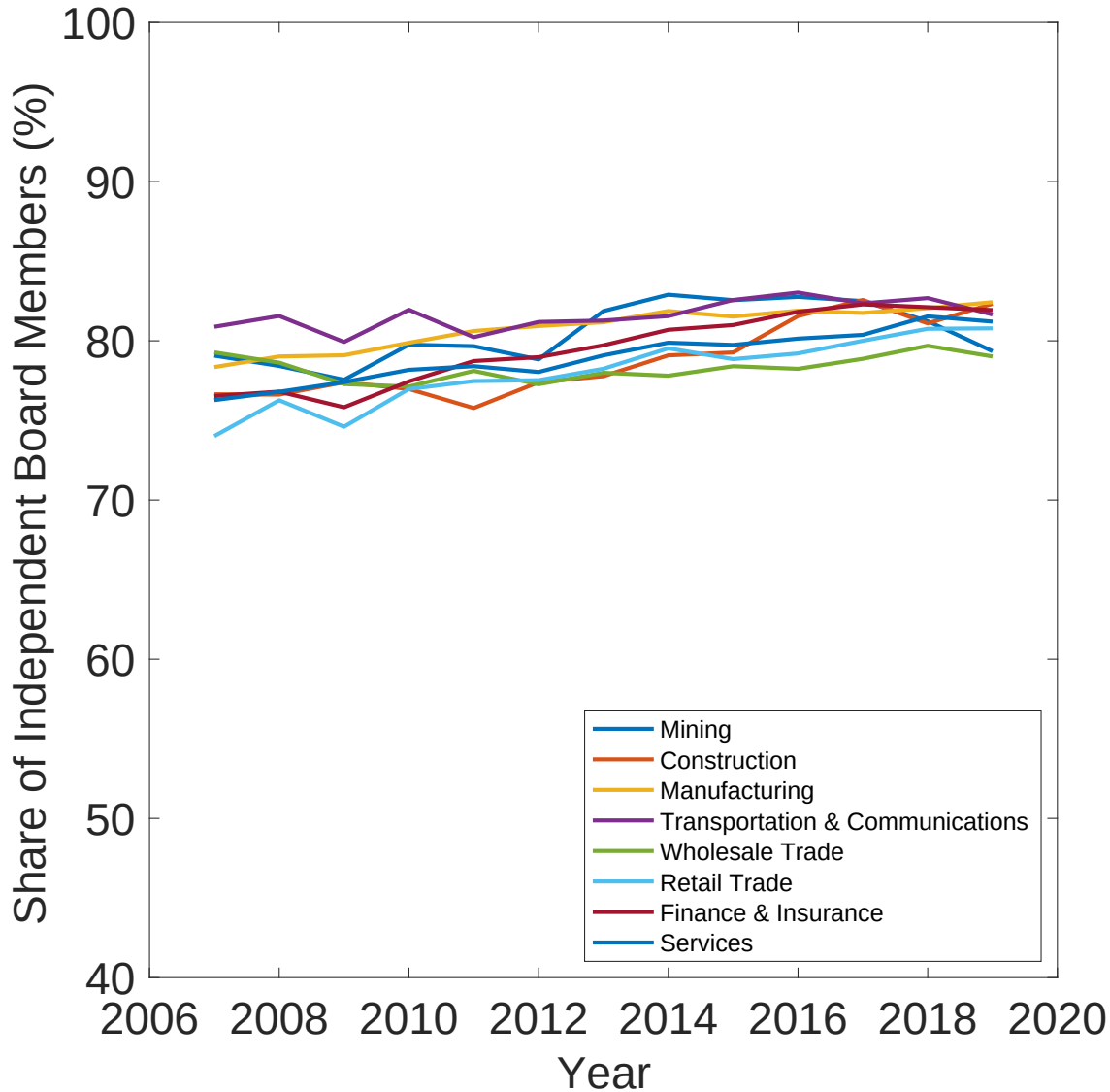
- We explore three key avenues that may explain these patterns:
  - We determine firm preferences for change which vary across the performance distribution are not playing a large role in driving hiring patterns
  - Our model suggests that **higher quality information** on insiders, **baseline preferences** for insiders, and **substantial firing costs** are the main contributors to the hiring differential

Appendix


Share of Independent Board Members (%)
100
90
80
70
60
50
40
2006
2008
2010
2012
2014
2016
2018
2020
Year
Mining
Construction
Manufacturing
Transportation & Communications
Wholesale Trade
Retail Trade
Finance & Insurance
Services

◂ Return

- Finally, the board's problem can be stated as:

$$\max_{r \in \{0,1\}} \{V_r(x_{ijt}) + \nu^1_{rit}\} \tag{4}$$

- State: $x_{ijt} = (y_{ijt-1}, \tilde{\theta}_{ijt}, m_{ijt}, \tau_{ijt}, a_{ijt})$
- $V_1(x_{ijt})$ denotes the conditional value of firing
  - Captures the monetary and non-pecuniary cost of firing the current CEO, and the conditional value of hiring the optimal replacement
- $V_0(x_{ijt})$ denotes the conditional value of retention
  - Captures current profitability and the discounted conditional value of entering the hiring and firing stages next period

- The board solves:

$$\max_{r \in \{0,1\}} \{V_r(x_{ijt}) + \nu^1_{rit}\} \tag{4}$$

- The conditional value of turnover is given by:

$$V_1(x_{ijt}) = -(\pi \times \mathbf{1}[\textit{Fire CEO}]) + \mathbb{E}_{\boldsymbol{x}} \left[\max_{m \in \mathscr{C}} \{V_0(x_{ijt}) + \nu^2_{mit}\} \right]$$

- The conditional value of retaining the CEO is given by:

$$V_0(x_{ijt}) = \mathbb{E}_{\boldsymbol{x}} \big[Y_{ijt} + \beta \big(g(x_{ijt}) V_1(x_{ijt+1}) + (1 - g(x_{ijt})) \max_{r \in \{0,1\}} \{V_r(x_{ijt+1}) + \nu^1_{rit+1}\} \big) \big]$$

- Discount rate fixed at $\beta = 0.9$ in estimation

◂ Return

- Match quality means ($\mu_{\theta_O}, \mu_{\theta_I}$):
  - Variation in y_{ijt} across CEO types
- Scale parameters ($\sigma_\theta, \sigma_s, \sigma_\eta$):
  - Within and across CEO-firm (spell) variation in y_{ijt}
- Turnover costs (c, π):
  - Variation in y_{ijt} around turnover, firing rate (hazards)
- Insider preferences (γ_1, γ_2):
  - Variation in hiring probabilities across y_{ijt-1} conditional on turnover
- Persistence (ρ):
  - Empirical persistence in y_{ijt} within firm
- Voluntary turnover ($\hat{g}$):
  - Variation in retirement rates across age, tenure, and CEO type

◂ Return