Consequences of Misreporting

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Research Question: How large are the benefits of misreporting and the costs of detection?

What we do and what we find

Develop and estimate dynamic firm model:

- Firms invest, save, raise external finance, and can misreport profits
- Misreporting profits lowers financing costs but risks being caught and flagged as a “fraudster”
- Estimated on US firm data (CRSP/Compustat + Audit Analytics, 2003–2019)

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Findings:

- Financing costs are **sensitive** to reported profits ($+1$pp $\Rightarrow$ -1.8% per-unit cost)
- Pecuniary and reputational punishments are **quantitatively small**
- Almost the entire cost of being flagged is the **lost ability to misreport**:
  Flagged firm's external finance is priced off *true* profits
- Prohibiting misreporting cuts firm value by $\mathbf{3.1}\%$ — two-thirds is the **option value** of the channel

Literature

Structural dynamic corporate finance:

- Financing frictions, liquidity, investment, payout
  (Hennessy & Whited, 2007; Riddick & Whited, 2009; Eisfeldt & Muir, 2016; Begenau & Salomao, 2019).

Misreporting, detection, and dynamic reporting models:

- Detection and real/market consequences; dynamic concealment, detection, punishment
  (Karpoff et al., 2008; Dyck et al., 2010; Kedia & Philippon, 2009; Zakolyukina, 2018; Bertomeu et al., 2022; Terry et al., 2023).

Measuring external finance costs:

- Financing costs and borrowing constraints in the data
  (Lian & Ma, 2021; Drechsel, 2023).

This paper:

- Misreporting **reduces** current financing costs, but **raises** detection risk
- Cheating may be **value-maximizing** to shareholders, not purely an agency problem
- Generates reporting cycles and time-varying financing costs

Roadmap

Model

Estimation

Results

Conclusion

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Environment and the firm's problem

- Discrete time, infinite horizon, discount rate r, liquidity return $r_\ell < r$
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  - Flag status $(f \in \{0, 1\})$

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- A **flagged** firm ($f = 1$) is **cannot misreport** ($m = 0$), pays a penalty and a reputational surcharge

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Notation: hats $(\hat{x})$ denote **reported** variables; no hats (x) denote **true** variables

Production and misreporting

- DRS technology with a convex **cost** of changing the **bias**:

$$\pi = \underbrace{z\,k^{\alpha}}_{\text{Revenues}} - \underbrace{\eta\,(m - m_{-1})^{2}}_{\text{Resource cost of misreporting}}$$

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- $m > 0 \longrightarrow$ firm is **caught** with prob q_p and **flagged**:
  - Pay **pecuniary** penalty $p_m\, m_{-1}^2$ once caught
  - Face **reputational** surcharge λ_f in financing costs
  - **Cannot misreport** $(m = 0)$
  - Exits scrutiny with prob $1 - q_f$

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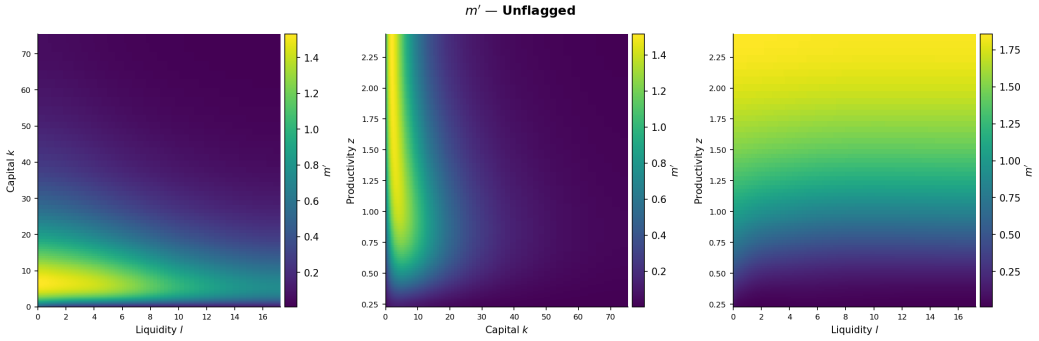
- **Flagged** — priced off **true** profits, plus a **reputational** surcharge λ_f:

$$\Lambda(\pi, e, f = 1) = \big(\lambda_1 \exp\big(-\lambda_\pi \pi\big) + \lambda_f\big)\,|e|$$

- Being flagged **removes** ability to cheat from increased scrutiny

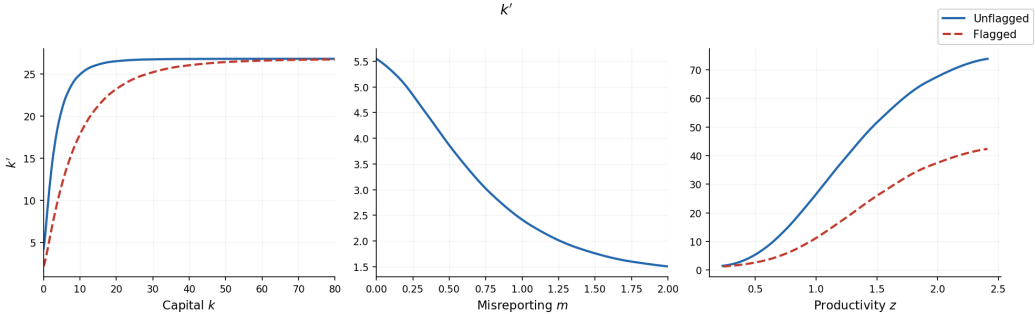
Model Timing

Who misreports? Low-k, low-ℓ, high-z firms



Misreporting is concentrated where financing needs are high relative to current resources.

Costs of being flagged? Lower investment



Flagged firms invest less because the external financing is priced off true profits.

Estimation

Data and estimation strategy

- Sample 2003–2019
- CRSP/Compustat (financials), Audit Analytics (restatements), İmrohoroğlu–Tüzel (TFP)
  - Intentional misreports á la Terry et al (2023)
  - 40,311 firm-years, 3,083 firms; 0.8% caught, avg. cheating spell 4.6 years

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- Estimate the other **12 parameters** by SMM on **14 moments**

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- **Identification in a nutshell**:
  - TFP moments $\Rightarrow$ productivity (ρ_z, μ_z, σ_z)
  - Production moments $\Rightarrow$ investment returns (α, δ)
  - Financing moments $\Rightarrow$ cost of external finance (λ_1, λ_π)
  - Detection-event moments $\Rightarrow$ costs of misreporting (q_p, p_m, η)
  - Post-detection event study $\Rightarrow$ costs of being flagged (λ_f, q_f)

Model fit

Estimates: the punishment is mostly the lost channel

Symbol	Description	Value
Financing		
λ_1	Baseline cost	1.400
λ_π	Reported-profit sensitivity	1.816
λ_f	Flagged surcharge	2.6×10^{-3}
Flag and cheating		
q_p	Detection probability	0.021
q_f	Flag-state persistence	0.682
ρ_m	Pecuniary penalty	8.3×10^{-4}
η	Bias adjustment cost	3.2×10^{-3}

All parameter estimates

- Detection is rare, but flags are persistent:
  - Misreporter caught $\sim$ once every 48 years
  - Once flagged, scrutiny lasts $\sim$ 3.1 years

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The main cost of detection is **losing the ability to misreport**, not the fine or stigma

Results

How much do firms value the option to misreport?

		% Change from Baseline					
	Baseline	$\lambda_\pi/2$	$2\lambda_\pi$	p_m=0	λ_f=0	q_f=1	No Cheating
V	6.85	-4.63	5.04	-0.10	-0.50	-1.19	-3.10
i	0.1542	-17.18	0.56	-0.02	0.34	-16.32	-7.48
m	0.0233	21.08	-81.63	4.42	18.48	-96.79	-100.00
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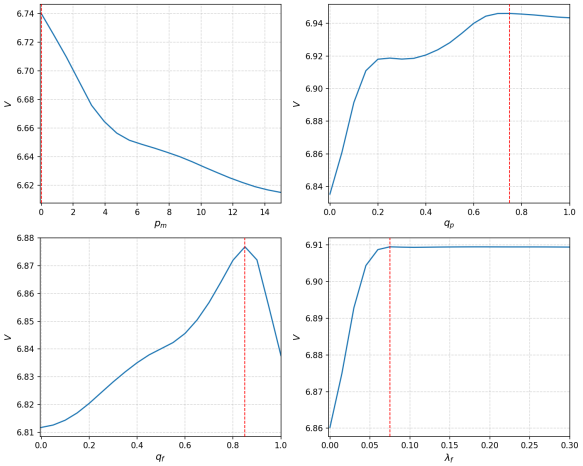
1.9**pp** (61%) **is the option value** from cheating

Which enforcement maximizes cross-sectional firm value?



- Cheating lets firms **finance cheaply**
- Each firm prefers **looser rules**: less exposure
- But large overstatements are **costly to carry**
- Tougher rules incentivise firms to **cheat less**
- Reduces cheating exposure and raises value
- Cash fines **hit value directly**: optimum p_m=0

Fraction misreporting

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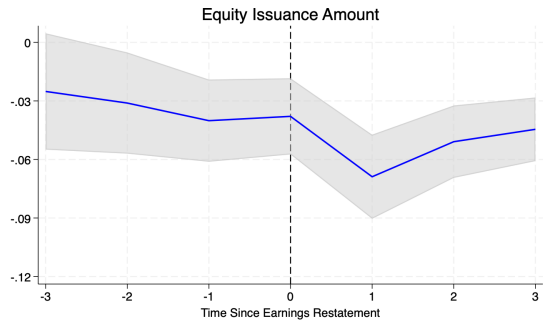
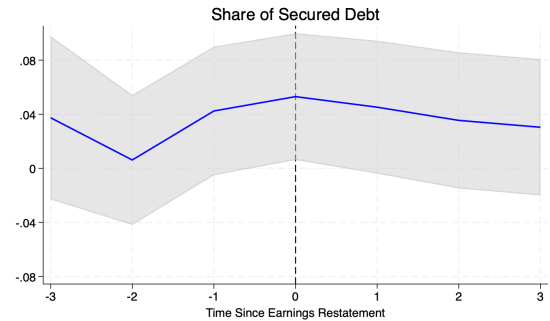
- Misreporting acts as a **financing technology**
- Detection is costly mostly because it removes access to that technology
- Financing costs are highly sensitive to reported profits
- Direct penalties and stigma surcharges are quantitatively small
- Removing cheating lowers shareholder value by **3.1%**; option to cheat is **61%**

The micro consequences of being caught cheating

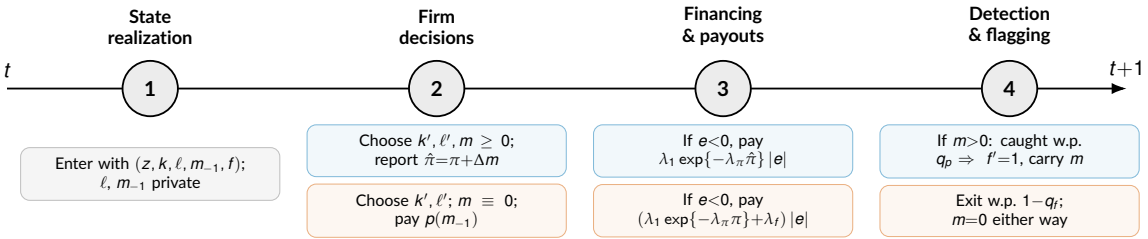
External Financing around Earnings Restatements





Back

Within-period timing



Bellman equations Back

Bellman equations

Let $\mathcal{V}(m, f) \equiv \mathbb{E}_z[v(z', k', \ell', m, f)]$, $i = k' - (1-\delta)k$.

Unflagged ($f = 0$), $e = \widehat{\pi} - i - \frac{\widehat{\ell'}}{1+r_\ell} + \widehat{\ell}$:

$$v(z, k, \ell, m_{-1}, 0) = \max_{k', \ell', m \geq 0} \Big\{ e - \mathbf{1}\{e < 0\}\Lambda(\widehat{\pi}, e, 0) + \frac{\mathbf{1}\{m = 0\}}{1+r}\mathcal{V}(0, 0) + \frac{\mathbf{1}\{m > 0\}}{1+r}\left(q_p \mathcal{V}(m, 1) + (1-q_p)\mathcal{V}(m, 0)\right) \Big\}$$

Flagged ($f = 1$), $e = \pi - p_m m_{-1}^2 - i - \frac{\ell'}{1+r_\ell} + \ell$:

$$v(z, k, \ell, m_{-1}, 1) = \max_{k', \ell' \geq 0} \Big\{ e - \mathbf{1}\{e < 0\}\Lambda(\pi, e, 1) + \frac{1}{1+r}\left(q_f \mathcal{V}(0, 1) + (1-q_f)\mathcal{V}(0, 0)\right) \Big\}$$

Back

Targeted moments: data and model

Moment	Data	Model
Production		
Autocorrelation of $\ln z$	0.659	0.655
Mean drift of $\ln z$	-0.106	-0.101
Var. resid. AR(1) $\ln z$	0.066	0.069
Avg. reported profitability	0.015	0.017
Avg. investment rate	0.129	0.154

Moment	Data	Model
Financing / flag dynamics		
Freq. EF > 0	0.293	0.309
Mean EF $\mid$ EF > 0	0.476	0.448
Corr(m, EF$> 0 \mid$ caught)	0.121	0.130
Inv. rate $\mid$ post-detect.	0.118	0.131
Freq. EF$> 0 \mid$ post-det.	0.222	0.288
Mean EF $\mid$ EF> 0, post-det.	0.333	0.372
Cheating		
Frac. caught cheating	0.008	0.010
Avg. bias m at detection	0.057	0.048
Avg. years of spell	4.626	4.376

Back

Estimated and externally calibrated parameters

Parameter	Description	Value
Panel A: Externally calibrated		
r	Discount rate	0.015
r_ℓ	Liquidity return	0.012
Panel B: Internally estimated — Production		
ρ_z	Persistence of log TFP	0.655
μ_z	Unconditional log-mean of TFP	-0.294
σ_z	Innovation std. of log TFP	0.253
α	Returns to scale	0.518
δ	Capital depreciation rate	0.071
Panel C: Internally estimated — Financing		
λ_1	Baseline per-unit financing wedge	1.400
λ_π	Reported-profit sensitivity of wedge	1.816
λ_f	Flagged reputational surcharge	2.64e-3
Panel D: Internally estimated — Flag and cheating		
q_f	Persistence of flagged state	0.682
q_p	Per-period detection probability	0.021
p_m	Pecuniary penalty intensity	8.30e-4
η	Bias adjustment-cost intensity	3.16e-3

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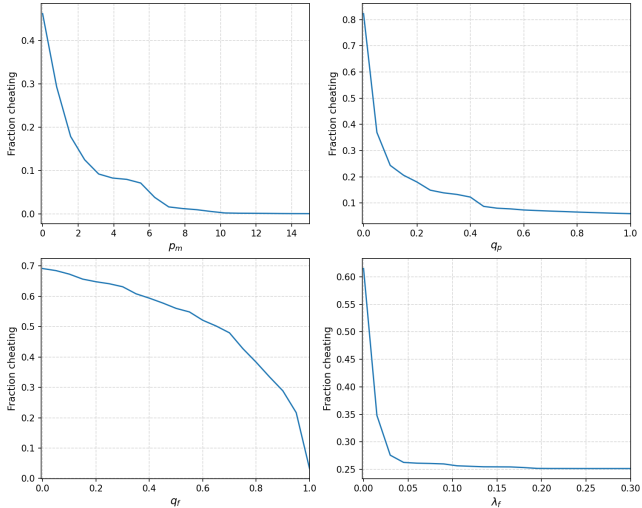
Equilibrium fraction misreporting



Stronger enforcement lowers the share of firms that misreport

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