Testing Disagreement Models

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The paper in a nutshell

- We attempt to provide causal evidence for the role of disagreement in asset pricing
- We identify a randomly assigned shock to firms' info environments (i.e., the staggered introduction of EDGAR)
- We verify that the shock affects standard measures of disagreement
- We use DD and IV designs to trace out how changes in disagreement affect
  - stock price crash risk
  - stock returns
- We test additional cross-sectional predictions on
  - binding short-sale constraints
  - investor optimism

A short primer on disagreement models

- In disagreement models, investors with identical information have heterogeneous priors and agree to disagree

- Helps explain elevated trading in financial markets w/o news (Karpoff 1987, Varian 1989, Kandel and Pearson 1995)

- With short-sale constraint, disagreement leads to
  - overvaluation/speculative bubbles (Miller 1977, Harrison and Kreps 1978, Morris 1996, Scheinkman and Xiong 2003)
  - stock price crash risk (Hong and Stein 2003)

Related literature

Investor disagreement and …

- **volume** (Karpoff 1987, Varian 1989, Harris & Raviv 1993, Kandel & Pearson 1995, Banerjee & Kremer 2010)
- **stock price crash risk** (Hong & Stein 2003, Chen, Hong & Stein 2001)
- **stock returns** (Miller 1977, Diether, Malloy & Scherbina 2002, Chen, Hong & Stein 2002, Sadka and Scherbina 2007, Berkman et al. 2009, Hong & Sraer 2016, Yu 2011)
- **bubbles** (Harrison & Kreps 1978, Scheinkman & Xiong 2003, Hong, Scheinkman & Xiong 2006)
- **acquirer returns** (Moeller et al. 2007)

Staggered implementation of EDGAR

- Gao and Huang (2019), Emery and Gulen (2019), Guo et al. (2019) Chang, Ljungqvist, and Tseng (2019)

Roadmap

Our empirical strategy proceeds in five steps

1. [DD] Inclusion in EDGAR reduces standard measures of investor disagreement (first-stage)
2. [DD] Inclusion in EDGAR reduces standard measures of stock price crash risk (reduced form)
3. [2SLS/IV] Reductions in investor disagreement lead to reductions in stock price crash risk (but not in jump risk)
4. [Triple-diff] In the cross-section, the reduction in crash risk is greater for firms with more binding short-sale constraints or higher investor optimism
5. [DD/IV/calendar-time portfolios] Reductions in investor disagreement lead to higher returns

Using EDGAR to identify the role of investor disagreement in asset prices

EDGAR inclusion plausibly reduces investor disagreement

- Investors' costs of becoming informed fall (Gao & Huang 2019)
- Investors' costs of verifying analyst reports fall: strategic behavior ↓, dispersion in forecasts ↓ (Chang, Ljungqvist & Tseng 2019)

EDGAR inclusion has three desirable features

- Random assignment (conditional only on size)
  - controls = future treated firms, matched on size
- Staggered implementation
  - can difference away confounding common effects
- Lack of anticipation effects
  - waves 1-4 did not know that their filings would go online
  - waves 5-10 were given short notice on phase-in dates

DD: EDGAR inclusion and investor disagreement

	Dispersion (next quarter) (1)	Dispersion (year-ahead) (2)	Range (next quarter) (3)	Range (year-ahead) (4)	Trading volume (5)
Quarter of EDGAR inclusion	-0.020	-0.099**	-0.030*	-0.242***	-0.038
Next four quarters	-0.054***	-0.228***	-0.064***	-0.406***	-0.307***
Controls?	yes	yes	yes	yes	yes
Calendar quarter FE?	yes	yes	yes	yes	yes
Fiscal quarter FE?	yes	yes	yes	yes	yes
Firm FE?	yes	yes	yes	yes	yes
R-squared	67.2%	66.6%	64.3%	69.7%	75.9%
Pre-trends (*p*-value)	0.333	0.825	0.258	0.102	0.224
No. of firms	1,582	2,059	1,582	2,059	3,235
No. of firm-quarters	9,237	15,141	9,237	15,141	23,099

DD: EDGAR inclusion and stock price crash risk

	Skewness ($NCSKEW$) (1)	Down-to-up volatility ($DUVOL$) (2)	Extreme negative returns, 0.01% ($CRASH001$) (3)	Extreme negative returns, 0.1% ($CRASH01$) (4)	Extreme negative returns, 1% ($CRASH1$) (5)
Quarter of EDGAR inclusion	0.011	0.003	-0.002	-0.003	-0.009
Next four quarters	-0.040**	-0.026**	-0.025***	-0.038***	-0.033**
Controls?	yes	yes	yes	yes	yes
Calendar quarter FE?	yes	yes	yes	yes	yes
Fiscal quarter FE?	yes	yes	yes	yes	yes
Firm FE?	yes	yes	yes	yes	yes
R-squared	17.0%	18.7%	15.5%	15.5%	13.7%
Pre-trends (*p*-value)	0.425	0.095	0.918	0.771	0.374
No. of firms	3,366	3,366	3,366	3,366	3,366
No. of firm-quarters	28,652	28,652	28,652	28,652	28,652

2SLS/IV: Investor disagreement and crash risk

	Crash measure				
	Skewness ($NCSKEW$) (1)	Down-to-up volatility ($DUVOL$) (2)	Extreme negative returns, 0.01% ($CRASH001$) (3)	Extreme negative returns, 0.1% ($CRASH01$) (4)	Extreme negative returns, 1% ($CRASH1$) (5)
Disagreement measure					
Dispersion (next quarter)	1.063	0.833*	0.573*	0.621	0.972*
Dispersion (fiscal year)	0.340**	0.189**	0.159***	0.199**	0.193**
Range (next quarter)	0.946	0.741*	0.510*	0.552	0.864*
Range (fiscal year)	0.209**	0.116**	0.098***	0.122**	0.119**
Trading volume	0.184**	0.077	0.101***	0.138***	0.131**
Weak-instrument test statistics					
Dispersion (next quarter)	15.2	15.2	15.2	15.2	15.2
Dispersion (fiscal year)	20.4	20.4	20.4	20.4	20.4
Range (next quarter)	10.3	10.3	10.3	10.3	10.3
Range (fiscal year)	17.2	17.2	17.2	17.2	17.2
Trading volume	13.9	13.9	13.9	13.9	13.9
No. of firm-quarters					
Dispersion (next quarter)	9,034	9,034	9,034	9,034	9,034
Dispersion (fiscal year)	14,947	14,947	14,947	14,947	14,947
Range (next quarter)	9,034	9,034	9,034	9,034	9,034
Range (fiscal year)	14,947	14,947	14,947	14,947	14,947
Trading volume	22,789	22,789	22,789	22,789	22,789

Alternative channel

Bad-news hoarding rather than disagreement? (Jin & Myers 2006)

- DD tests with measures of reporting transparency
  - return on asset, discretionary accruals, tendency to narrowly meet-or-beat analyst consensus
- Do not find evidence that firms change their reporting transparency around EDGAR inclusion

Triple-diff: Heterogeneous treatment

Heterogeneous treatment: Binding short-sale constraints

- Effect of disagreement on stock price crash risk should be stronger when SS constraints are tighter
- Measure of binding short-sale constraints:

  beta (Hong & Sraer 2016), institutional ownership (Nagel 2005), and membership in the S&P500 index
- Triple-diff results consistent with prediction

Heterogeneous treatment: Investor optimism

- Effect of disagreement on stock price crash risk should be stronger if the marginal investor is more optimistic
- Measure of investor optimism: PVGO index (Benveniste et al. 2003)
- Triple-diff results consistent with prediction

Return predictability

- Disagreement models predict high investor disagreement will be followed by low returns (Miller 1977)
  - pessimistic investors forced out of the market by short-sale constraints, prices reflect optimistic views
  - Diether, Malloy & Scherbina (2002), Chen, Hong & Stein (2002), Yu (2011)
- We revisit this evidence with the EDGAR shock to investor disagreement
  - DD and IV
  - calendar-time portfolios

Return predictability

	R_{raw} (1)	R_e (2)
Panel A: DD estimates		
Quarter of EDGAR inclusion	0.030***	0.022***
Next four quarters	0.022**	0.021**
Controls?	yes	yes
Calendar quarter FE?	yes	yes
Fiscal quarter FE?	yes	yes
R-squared	27.9%	25.7%
No. of firms	3,343	3,343
No. of observations	27,410	27,413
Panel B: IV estimates		
Disagreement measure:		
Dispersion (quarter-ahead)	-0.647*	-0.655*
Dispersion (year-ahead)	-0.096**	-0.107**
Range (quarter-ahead)	-0.629*	-0.636*
Range (year-ahead)	-0.062**	-0.069**
Trading volume	-0.040	-0.045

Return predictability

Portfolio	Holding period	Excess return (1)	FF 3-factor alpha (2)	FF 4-factor alpha (3)	FF 4-factor + Pastor-Stambaugh alpha (4)	FF 5-factor alpha (5)	HXZ (q-factor) alpha (6)	Mispricing alpha (7)
controls	3 months	0.61%	-1.21%	-1.21%	-0.97%	-0.76%	-0.75%	-0.95%
treated	3 months	1.94%	0.39%	0.36%	0.36%	0.71%	0.88%	0.74%
treated – controls	**3 months**	**1.33%**	**1.60%**	**1.58%**	**1.33%**	**1.47%**	**1.63%**	**1.69%**
		(5.98)	***(7.23)***	***(6.99)***	***(4.65)***	***(5.01)***	***(6.91)***	***(5.85)***
controls	6 months	-0.23%	-0.99%	-1.26%	-1.11%	-0.95%	-1.55%	-1.00%
treated	6 months	0.82%	0.15%	0.17%	0.39%	0.07%	0.51%	0.54%
treated – controls	**6 months**	**1.06%**	**1.14%**	**1.43%**	**1.51%**	**1.02%**	**2.06%**	**1.54%**
		(2.93)	***(3.40)***	***(6.62)***	***(6.63)***	***(2.15)***	***(5.09)***	***(3.20)***
controls	12 months	1.39%	0.07%	0.10%	0.13%	-0.02%	-0.02%	0.07%
treated	12 months	1.56%	0.42%	0.44%	0.45%	0.40%	0.36%	0.60%
treated – controls	**12 months**	**0.17%**	**0.35%**	**0.33%**	**0.32%**	**0.42%**	**0.38%**	**0.53%**
		(0.52)	***(1.04)***	***(0.93)***	***(0.88)***	***(0.90)***	***(0.76)***	***(1.12)***

Note: Returns are monthly

Summary

We causally identify the role of disagreement in asset pricing

- We propose a quasi-randomly assigned shock to the cost of accessing corporate disclosures and accordingly a reduction in investor disagreement
- Consistent with models of investor disagreement, we show that an exogenous reduction in disagreement leads to
  - reduced stock price crash risk
  - higher stock returns
- Our findings highlight a previously undocumented benefit of mandatory disclosure