An ETF-based measure of Stock Price Fragility

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Overview

Introduction

- **Stock price Fragility** is a firm-level measure of **exposure to non-fundamental** (e.g., sentiment, noise, liquidity needs) **price movements/demand shocks** (Greenwood and Thesmar, 2011).

- Exposure to future misvaluation/mispricing.

- **Fragility** is jointly determined by: i) **ownership composition**; ii) correlation between investors' **non-fundamental driven trades.**

Research problem

- Empirically **observing price shocks** that are **orthogonal to firm fundamentals is challenging**.

- Recent studies have **cast doubt on the validity of mutual fund flows** as a proxy of non-fundamental demand shocks.

- Current estimations may be biased, potentially resulting in misleading conclusions.

Main research Question

- Does ETF data improve the estimation of stock price fragility?

Motivation

Changes in the Asset Management Industry

- Current fragility estimation fails to account for the influence of other market participants such as **Exchange-Traded Funds (ETFs)** – *rise of passive investing*.
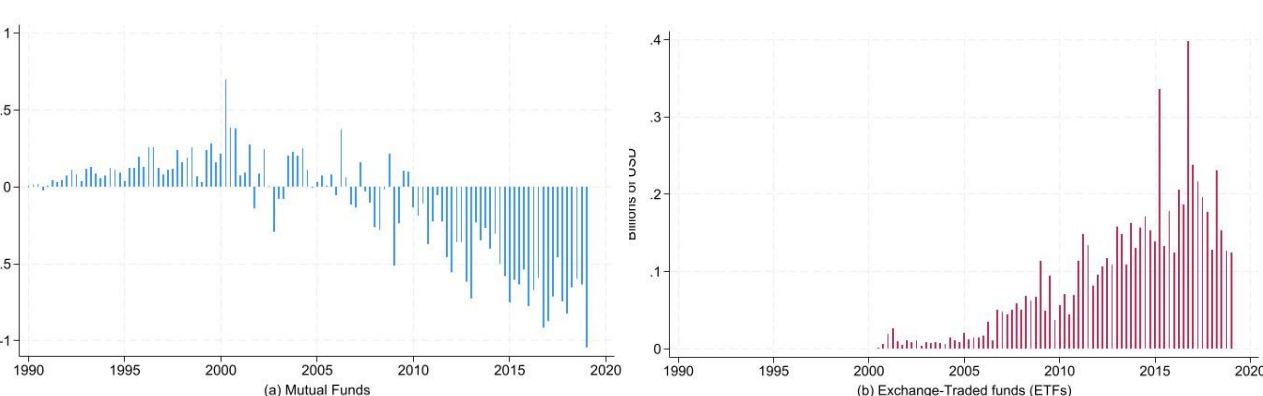
The role of Institutional Investors

- Institutional investors own an increasing share of the equity markets in the US. *Ownership concentration*.

- Increase adoption of ETFs in Institutional Investors portfolios.
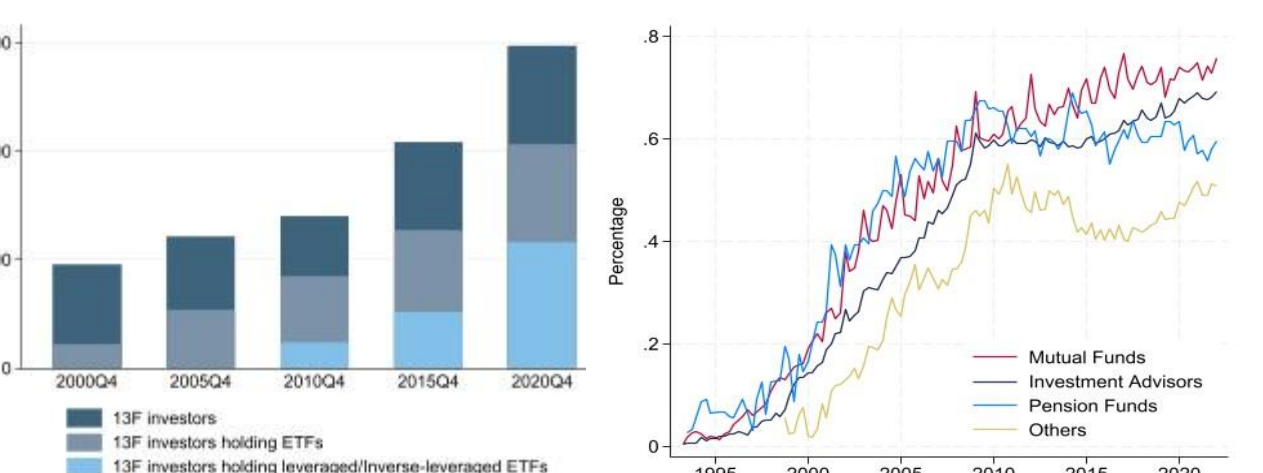
Methodology

- **ETF shares redemption and creation process - flow** (i.e., ETF primary market) **signal non-fundamental demand shocks** (Brown, Davies and Ringgenberg, 2021)

- **Relative mispricing** (i.e., ETF premium/discount) **signals fundamental mispricing.**

- For fragility to be a useful measure of non-fundamental risk, **it must be that fragility forecasts mutual fund (ETF) induced trading stock return volatility**.

We estimate the following specifications:

- FM regressions (Greenwood and Thesmar, 2011)

$$\sigma_{i,t+1} = \alpha + \beta\sqrt{G_{i,t}} + \delta Z_{i,t} + \mu_{i,t+1}$$

- Panel regressions Including 13F IO (Ben-David et al., 2021)

$$\sigma_{i,t+1} = \beta_1 TopIO_{i,t} + \beta_2 MidIO_{i,t} + \beta_3 BottomIO_{i,t} + \delta Z_{i,t} + \beta_4 G_{i,t} + \alpha_i + \theta_t + \mu_{i,t+1}$$

where $\sigma_{i,t+1}$ is the one-quarter-ahead standard deviation of daily stock returns.

$$\sigma_{i,t+1} = \alpha + \beta\sqrt{G_{active,t}} + \beta\sqrt{G_{passive,t}} + \delta Z_{i,t} + \mu_{i,t+1}$$

Results

- An ETF-based fragility (**G^{ETF}**) captures the influence of mid- and small- sized institutional ownership on stock price volatility

	Full Sample		2009-2018					
	Top 3 Inst	Top 10 Inst	Top 3 Inst			Top 10 Inst		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top IO	0.471**	0.263**	0.568**	0.617**	0.530**	0.406***	0.424***	0.328**
	(2.71)	(2.37)	(5.00)	(4.37)	(3.50)	(4.29)	(4.44)	(3.40)
Mid IO	0.163**	0.184**	0.164**	0.115	0.100	0.158*	0.048	-0.064
	(2.23)	(2.06)	(2.06)	(1.32)	(0.89)	(1.75)	(0.46)	(-0.45)
Bottom IO	-0.466***	-0.157*	0.086	0.069	0.018	0.106	0.076	-0.039
	(-2.90)	(-1.75)	(0.72)	(0.58)	(0.13)	(1.08)	(0.72)	(-0.28)
G^{MF}	0.034***	0.022**	0.020**		0.019	0.025**		0.016
	(2.88)	(2.08)	(2.15)		(1.54)	(2.17)		(1.15)
G^{ETF}				0.308**	0.206**		0.288**	0.200*
				(2.25)	(1.98)		(2.17)	(1.90)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	131,040	131,040	77,421	69,217	69,217	77,421	69,217	69,217
adj. R^2	0.659	0.667	0.652	0.689	0.689	0.652	0.689	0.703

- The forecasting power of the ETF-based fragility (**G^{ETF}**) on the next quarter's stock price volatility is mostly explained by active ETFs.

	Total return volatility		
	(1)	(2)	(3)
$G^{ETF(Active)}$	0.801**	0.727**	0.381**
	(2.89)	(2.91)	(2.26)
$\sqrt{G^{ETF(Passive)}}$	0.128*	0.130	-0.170**
	(1.92)	(0.32)	(-1.97)
$\sqrt{G^{MF}}$		0.387***	0.003
		(8.12)	(0.20)
Add Controls	No	No	Yes
Obs.	18,563	18,563	18,016
adj. R^2	0.013	0.026	0.471

Results

- The statistical and economic significance of Greenwood and Thesmar (2011) fragility (**G^{MF}**) **measure has significantly declined** *out-of-sample* **(2009-2018).**

- An ETF-based fragility (**G^{ETF}**) **strongly predicts next quarter stock return volatility.**

	Mutual funds								ETFs			
	Full sample				2009 - 2018						2009 - 2018	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\sqrt{G^{MF}}$	0.459***		0.305***	0.072**	0.325***		0.189***	0.018*				
	(11.82)		(8.57)	(2.75)	(8.75)		(6.26)	(1.70)				
$\sqrt{G^{ETF}}$									0.825***		0.722***	0.338***
									(7.76)		(7.10)	(5.93)
IO		0.015***				0.014***				0.003*		
		(15.64)				(14.27)				(2.35)		
log(numb owners)		0.027				-0.033***				-0.032***		
		(1.26)				(-2.82)				(-3.37)		
Own Herfindahl			-0.002***	-0.001			-0.004***	-0.002***			-0.001	-0.011
			(-4.27)	(-1.14)			(-6.51)	(-5.03)			(-1.00)	(-1.06)
Add Controls	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
N	148,342	148,342	148,342	137,283	58,377	58,377	58,377	54,633	45,078	45,078	44,808	42,776
adj. R^2	0.010	0.049	0.045	0.486	0.007	0.045	0.043	0.375	0.013	0.025	0.024	0.373

- The coefficient of **G^{ETF}** remains positive and statistically significant when including **G^{MF}**.

	2009 - 2018			
	(1)	(2)	(3)	(4)
$\sqrt{G^{MF}}$	0.067*		0.015	0.009
	(1.99)		(1.16)	(1.03)
$\sqrt{G^{ETF}}$	0.790***		0.795***	0.426***
	(7.77)		(8.20)	(7.95)
IO^{MF}		0.014***	0.012***	0.005***
		(11.11)	(12.37)	(7.47)
IO^{ETF}		0.002**	0.012***	0.007***
		(2.03)	(6.58)	(4.96)
Add Controls	No	No	No	Yes
Obs.	44,956	44,956	44,956	44,956
adj. R^2	0.015	0.025	0.034	0.376

- **G^{ETF}** provides information on fragility above and beyond that included in the **G^{MF}** measure.

Conclusion

- An ETF-based fragility measure **effectively overcomes many limitations associated with relying on mutual fund** data:
  - no confounding fundamental information from discretionary trades made by fund manager;
  - no need for an assumption regarding the underlying reasons driving fund flows.

- It **captures the influence of a broader set of investors** (i.e., retail and institutional investors) on stock return volatility.

- **Rising ETF activeness** significantly influences stock price fragility, an aspect mostly overlooked by traditional estimation method but effectively **captured in our methodology**.

- This findings can **help mitigate biases when estimating stock's exposure to non-fundamental demand shocks.**

Acknowledgements