Best Short

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Introduction

During the financial crisis in 2008, regulators adopted emergency measures to restrict or ban short selling $\longrightarrow$ **seen as a source of financial instability**

- These measures, however, failed to support security prices, were detrimental for liquidity, and impeded price discovery (e.g., Beber & Pagano, 2013),
- Short-sellers have valuable information and limiting their market participation can affect the informational efficiency (e.g., Boehmer & Wu, 2013).

Concerns on the benefits of short-selling bans has led some countries to introduce **greater transparency**

- European countries have recently adopted a uniform regime that requires immediate public disclosure of net short positions above a certain threshold,
- Timely and detailed data on individual investors' net short positions beyond traditional measures of short interest (e.g., Jones, Reed, & Waller, 2016).

This Paper

We exploit the granularity of net short positions at the investor-stock level

- Approximately 1.7 million holdings publicly disclosed by 585 investors on 1,389 stocks for European stock markets,
- Short positions tend to be concentrated on relatively few stocks and short sellers may have high conviction on towards selected bets.

We extract forward-looking expectations about future asset returns using investors' short conviction

- We find that selling high-conviction stocks while buying low-conviction stocks generates a sizeable risk-adjusted excess return – Best Short,
- Our results cannot be rationalized by risk factors, stock characteristics, transaction costs, market frictions, and measures of price efficiency.

Literature Review

High Short Interest predicts negative future returns

- Boehmer, Jones & Zhang (2008), Diether, Lee & Werner (2009),

Uncertainty about future loan fees affects prices

- Engelberg, Reed & Ringgenberg (2018),

Effects of disclosure regimes

- Jones, Reed, and Waller (2016),
  - ✓ Reduces short interest, bid-ask spreads, and price informativeness
  - ✓ Share prices react slowly to short position disclosures
  - ✓ Evidence of herding without large changes in short interest
- Jank & Smajlbegovic (2017), Jank, Roling & Smajlbegovic (2019)
  - ✓ Reluctance to cross the publication threshold
  - ✓ Secretive investors are better informed
  - ✓ There is a first-mover advantage

A **harmonized regime** that focuses on reporting/transparency obligations

- Investors, irrespective of their domicile, must disclose net short positions on stocks traded in European venues when certain limits are exceeded,
- Net short positions as difference between short and long positions held in cash and delta-adjusted derivatives, including indices (e.g., ADRs, ETFs).

A **daily** two-tier reporting system at the **stock-investor level**

- Confidential notification to the national authority: when a net short position crosses 0.2% of the issued share capital,
- Public disclosure made by the national authority: when a net short position reaches 0.5% of the issued share capital,
- Positions must be reported by the next trading day (3:30 pm local time) and then disclosed by the local authority by the same day.

Our Sample of Net Disclosed Positions

Net short positions assembled and provided by Caretta Data:

- 15 major European countries between November 2012 and December 2018,
- $\approx$ 1.7 million of net short positions publicly disclosed by 585 investors on 1,389 securities.

European securities lending data obtained from IHS Markit

- Amount of shares borrowed and available for lending, expected borrowing fees, and short interest for about 90% of the securities lending market,
- Data collected from the securities lending desks of prime brokers, custodians, asset managers, and hedge funds.

Other data are from Bloomberg and Ken French's data library

- Firms' characteristics (e.g., accounting data) and bid-ask spreads,
- Daily stock returns and risk factors for European stock markets.

Disclosed Net Short Positions

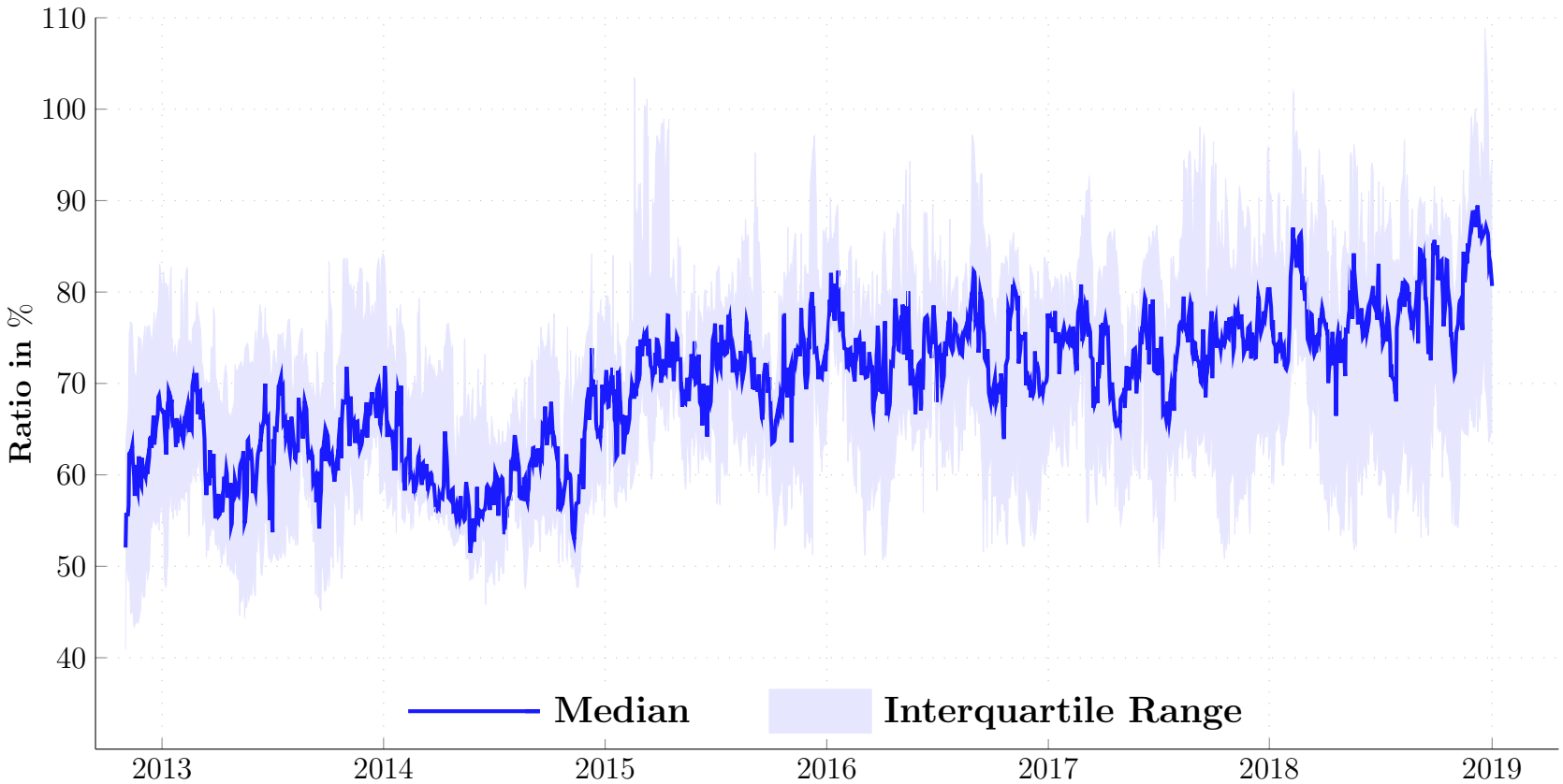
Summary Statistics by Country

	Number of Securities		Number of Disclosures		Daily Disclosures		Daily Positions ($ billion)	
Austria	22	1.6%	19,097	1.1%	12	1.1%	0.24	0.6%
Finland	41	3.0%	69,269	4.1%	43	4.1%	2.02	5.1%
France	133	9.6%	167,478	9.9%	104	9.8%	5.06	12.8%
Germany	186	13.4%	260,724	15.4%	162	15.3%	5.64	14.3%
Greece	6	0.4%	3,104	0.2%	6	0.5%	0.03	0.1%
Hungary	4	0.3%	7,867	0.5%	5	0.5%	0.22	0.6%
Ireland	4	0.3%	1,289	0.1%	2	0.1%	0.02	0.1%
Italy	123	8.9%	121,949	7.2%	76	7.2%	2.71	6.9%
Netherlands	63	4.5%	91,525	5.4%	57	5.4%	2.09	5.3%
Norway	42	3.0%	40,171	2.4%	25	2.4%	0.50	1.3%
Poland	28	2.0%	16,252	1.0%	10	1.0%	0.34	0.9%
Spain	67	4.8%	87,050	5.1%	54	5.1%	2.67	6.8%
Sweden	140	10.1%	146,953	8.7%	91	8.6%	3.72	9.4%
Switzerland	2	0.1%	875	0.1%	1	0.1%	0.04	0.1%
UK	528	38.0%	662,103	39.0%	412	38.9%	14.16	35.9%
Total	1,389	100%	1,695,706	100%	1,060	100%	39.47	100%

- Countries with infrequent daily disclosed positions not included by Caretta.

Net Short Positions

As Percentage of Short Interest



How **representative** is our sample? (as we observe holdings larger than 0.5%)

- Disclosed net short positions as percentage of short interest by stock,
- Median value within each country and then across countries.

Disclosed Net Short Positions

Summary Statistics by Investor Type

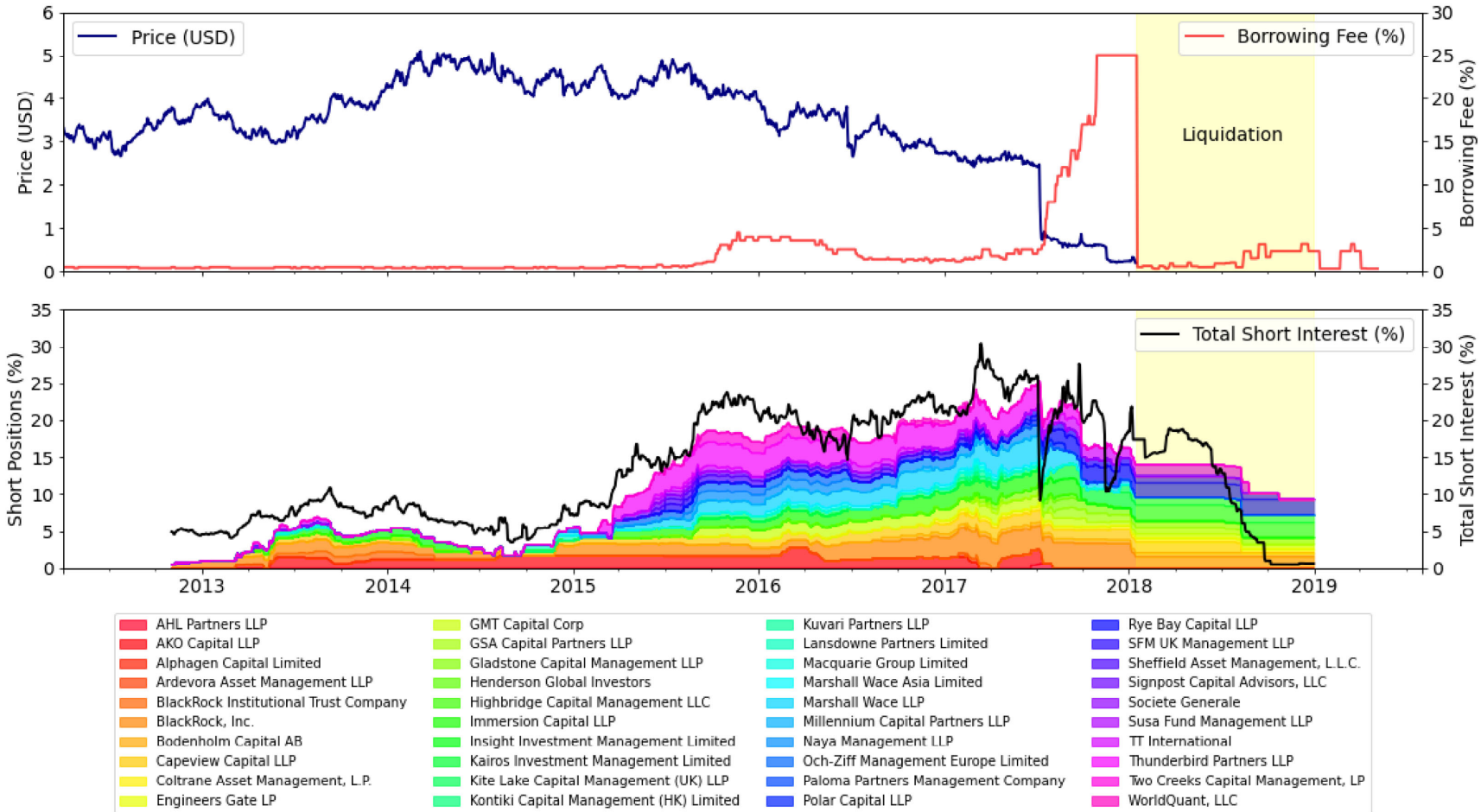
	Number of Securities		Number of Disclosures		Daily Disclosures		Daily Positions ($ billion)	
Asset Managers	132	22.6%	375,213	22.1%	234	22.1%	4.95	12.5%
Banks	28	4.8%	128,273	7.6%	80	7.5%	2.34	5.9%
Corporate Firms	3	0.5%	9,623	0.6%	7	0.6%	0.07	0.2%
Hedge Funds	415	70.9%	1,169,305	69.0%	729	68.8%	31.88	80.8%
Private Equity	6	1.0%	12,063	0.7%	9	0.8%	0.24	0.6%
Pension Funds	1	0.2%	1,229	0.1%	1	0.1%	0.01	0.0%
Total	585	100%	1,695,706	100%	1,060	100%	39.47	100%

We focus on hedge fund managers, i.e., $\approx$ 81% of the daily positions

- Holdings for other investors used as a robustness in the Appendix.

An Illustrative Example: Carillion

The company collapsed in January 2018



Disclosed Holdings across Managers

Median Value by Country

We document that managers' confidence in each of their holdings is not uniform

- Short positions are concentrated on relatively few stocks,
- Anton, Cohen & Polk (2021) show a similar pattern for mutual funds.

We hypothesise that short sellers have high conviction on selected bets

- We infer their forward-looking expectations on these stocks by exploiting the granular information from short positions at the manager-stock level.

Each investor i selects her portfolio allocation by solving:

$$\max_{\boldsymbol{w}_{i,t}} \boldsymbol{w}_{i,t}'\boldsymbol{\mu}_{i,t} - \frac{\gamma}{2}\boldsymbol{w}_{i,t}'\boldsymbol{\Omega}_{i,t}\boldsymbol{w}_{i,t},$$

- $\boldsymbol{\mu}_{i,t} = \mathbb{E}_{i,t}(\boldsymbol{R}^e_{t+1}) \longrightarrow$ future expected excess returns,
- $\boldsymbol{\Omega}_{i,t} = \mathbb{C}\mathbb{O}\mathbb{V}_{i,t}(\boldsymbol{R}^e_{t+1}) \longrightarrow$ conditional covariance matrix.

Reverse the closed-form solution for the portfolio weights

$$\boldsymbol{w}_{i,t} = \gamma^{-1}\boldsymbol{\Omega}_{i,t}^{-1}\boldsymbol{\mu}_{i,t} \longrightarrow \boldsymbol{\mu}_{i,t} = \gamma\boldsymbol{\Omega}_{i,t}\boldsymbol{w}_{i,t}$$

1. Assume that $\Omega_{i,t}$ depends on a single market factor

$$\boldsymbol{\Omega}_{i,t} = \underbrace{\boldsymbol{\Sigma}_{i,t}}_{diag\{\sigma^2_{ij,t}\}} + \sigma^2_m \boldsymbol{\beta}_i \boldsymbol{\beta}_i' \longrightarrow \boldsymbol{\mu}_{i,t} = \gamma \boldsymbol{\Sigma}_{i,t} \boldsymbol{w}_{i,t} + \gamma \sigma^2_m \boldsymbol{\beta}_i \boldsymbol{\beta}_i' \boldsymbol{w}_{i,t}.$$

2. Each investor i has a market-neutral strategy (i.e., $\boldsymbol{\beta}_i' \boldsymbol{w}_{i,t} = 0$)

$$\boldsymbol{\mu}_{i,t} = \gamma \boldsymbol{\Sigma}_{i,t} \boldsymbol{w}_{i,t}.$$

These assumptions imply that the weight of investor i in stock j is

$$\frac{1}{\gamma} \frac{\mu_{ij,t}}{\sigma_{ij,t}} = w_{ij,t}$$

proportional to her subjective expectation of the information ratio.

Investor's Expectations

A Simple Measure of Short Conviction

Compute **short conviction** of investor i in asset j on day t as

$$C_{ij,t} = \frac{V_{ij,t}}{\sum_j V_{ij,t}},$$

- $V_{ij,t} \longrightarrow$ dollar exposure in asset j,

Obtain **short conviction** for asset j on day t as

$$C_{j,t} = \frac{1}{N_t} \sum_i C_{ij,t}.$$

- $N_t \longrightarrow$ investors with disclosed positions.

The measure $C_{j,t}$ may harvest information from small/highly specialized funds

- Funds with limited resources, higher costs of acquiring information, capacity or leverage constraints may find optimal to focus on a few selected stocks,
- Specialization in managerial information (e.g., Kacperczyk, Sialm & Zheng, 2005; Van Nieuwerburgh & Veldkamp, 2010).

Portfolios sorted on Short Conviction

Summary Statistics

	P_1	P_2	P_3	P_4	P_5	*Naïve Short*	*Best Short*
Mean	7.94	4.25	4.49	3.86	−0.07	−3.72	8.00***
	[1.08]	[0.58]	[0.65]	[0.54]	[−0.01]	[-0.53]	[2.66]
Volatility	16.89	17.26	16.30	16.64	17.17	16.31	7.33
Skewness	−0.89	−0.97	−1.11	−0.67	−0.73	0.96	0.62
Kurtosis	8.62	9.09	9.88	5.08	5.56	8.26	5.59
Sharpe Ratio	0.45	0.22	0.25	0.21	−0.03	−0.23	1.09
Sortino Ratio	0.58	0.29	0.32	0.28	−0.03	−0.37	1.86
Max Drawdown	−34.99	−31.24	−33.86	−36.84	−39.19	−50.54	−9.52
AC(1)	0.13	0.10	0.10	0.10	0.11	0.11	0.05

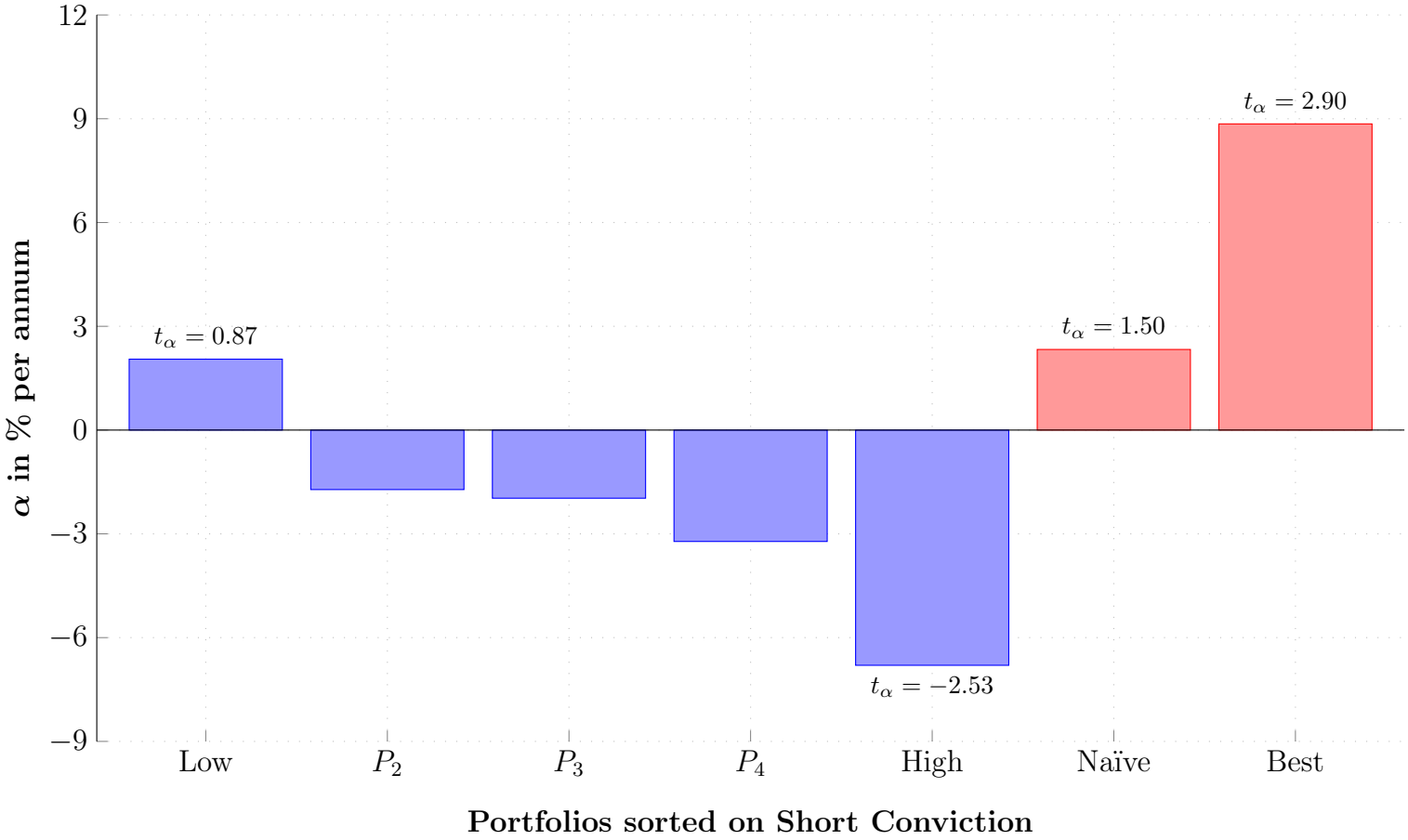
t-statistics in brackets are based on Newey and West (1987) standard errors.

The **Best Short** delivers an excess return of 8% per annum

- Sells high-conviction stocks (P_5) and buys long low-conviction stocks (P_1),
- Different from a short-only strategy such as the **Naïve Short**.

Portfolios sorted on Short Conviction

Risk-Adjusted Excess Returns



Exposure to Market Frictions

A short sale is generally completed over-the-counter and its terms are only observed by the parties directly involved in the transaction

- Do frictions in the securities lending market explain the profitability of our short conviction strategy?

The recent literature has investigated the role of

- Short-selling risk (e.g., Engelberg, Reed & Ringgenberg, 2018),
- Search costs (e.g., Kolasinski, Reed & Ringgenberg, 2013),
- Leverage constraints (e.g., Shleifer & Vishny, 1997),
- Scarcity of lendable shares (e.g., Chen, Hong, & Stein, 2002).

Exposure to Short-Selling Risk

Time-Series and Cross-Sectional Regressions

	Panel A: Factor Prices							
	Borrowing Fees				Option Market			
	λ_{MKT}	λ_{SSR}	HJ	$R^2(\%)$	λ_{MKT}	λ_{SSR}	HJ	$R^2(\%)$
GMM	2.410	0.937	0.063	33.9	6.501	0.608	0.058	36.5
	(6.463)	(0.645)	[0.928]		(6.001)	(0.435)	[0.863]	
	Panel B: Factor Betas							
	α	β_{MKT}	β_{SSR}	$R^2(\%)$	α	β_{MKT}	β_{SSR}	$R^2(\%)$
P_1	1.443	1.059***	2.800	77.0	1.463	1.056***	−3.224	77.0
	(3.065)	(0.029)	(3.176)		(3.109)	(0.032)	(4.693)	
P_2	−2.402	1.107***	0.463	80.4	−2.527	1.102***	−4.439	80.4
	(2.774)	(0.029)	(2.869)		(2.780)	(0.033)	(5.026)	
P_3	−2.137	1.047***	3.501	81.1	−2.010	1.044***	−4.856	81.0
	(2.486)	(0.030)	(2.904)		(2.506)	(0.033)	(4.748)	
P_4	−2.811	1.049***	−0.257	77.9	−2.570	1.043***	−8.152**	77.9
	(2.735)	(0.018)	(3.485)		(2.785)	(0.019)	(3.941)	
P_5	−7.037**	1.062***	−1.059	75.3	−6.430*	1.060***	−6.296	75.5
	(3.304)	(0.021)	(3.180)		(3.305)	(0.023)	(4.813)	

Conviction may reflect **various frictions** (e.g., liquidity, investor recognition) that limit the ability of the market to incorporate information into prices

- We relate short conviction to the speed of information diffusion, proxied with price delay (e.g., Hou & Moskowitz, 2005; Boehmer & Wu, 2013),
- A larger price delay means a less efficient stock price.

In June of each year t, run for each stock j the following regression

$$r_{j,\tau} = \alpha_j + \beta_j r_{m,\tau} + \sum_{\ell=1}^{4} \delta_{j,\ell}\, r_{m,\tau-\ell} + \epsilon_{j,\tau}$$

- $r_{j,\tau} \longrightarrow$ weekly returns from July of year $t-1$ to June of year t,
- $r_{m,\tau} \longrightarrow$ weekly returns from July of year $t-1$ to June of year t.

We quantify price delays as

$$D1_{j,t} = 1 - \frac{R^2_{[\delta_1=\delta_2=\delta_3=\delta_4=0]}}{R^2}$$

and

$$D2_{j,t} = \frac{\sum_{\ell=1}^{4} |\delta_{j,\ell}|}{|\beta_j| + \sum_{\ell=1}^{4} |\delta_{j,\ell}|}$$

We then run panel regressions (e.g., Engelberg, Reed & Ringgenberg, 2018)

$$D_{j,t} = \alpha + \beta C_{j,t} + \gamma' X_{j,t} + \alpha_t + \epsilon_j$$

- $C_{j,t}$ is the average between July of year $t-1$ and June of year t,
- $X_{j,t}$ denotes control variables averaged over the same period.

Price Delay and Price Efficiency

Fixed-Effects Panel Regressions

	Panel A: Price Delay D1				Panel B: Price Delay D2			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Short Conviction	0.018**	0.014*	0.021**	0.019**	0.015**	0.012*	0.013	0.012
Loan Supply	−0.080	0.004	−0.033*	−0.032*	−0.041	0.015	−0.013	−0.012
Short Selling Risk		0.001**	0.002	0.002		0.001	0.001	0.001*
Log Market Cap		−0.038***	−0.017**	−0.017**		−0.028***	−0.015**	−0.015**
Price-to-Book		0.005***	0.004***	0.004**		0.004***	0.003***	0.003**
Volatility		0.272***	0.267**	0.276**		0.153**	0.154**	0.162**
Bid-Ask Spread			7.458***	7.729***			4.368**	4.574**
Illiquidity			1.781*	1.659			1.258**	1.151**
Short Interest			−0.167	−0.133			0.002	0.025
Borrowing Fees			−0.231	−0.216			−0.200	−0.184
Inst. Ownership			0.043**	0.041*			0.037***	0.035**
Analyst Coverage			−0.182**	−0.164**			−0.107*	−0.093
Leverage				−0.248				−0.221
Profitability				0.094				0.076
Skewness				0.656				0.343
Constant	0.265***	0.447***	0.273***	0.267***	0.477***	0.623***	0.509***	0.505***
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	7.10	22.30	24.50	24.70	12.00	23.90	25.60	25.70
N	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850

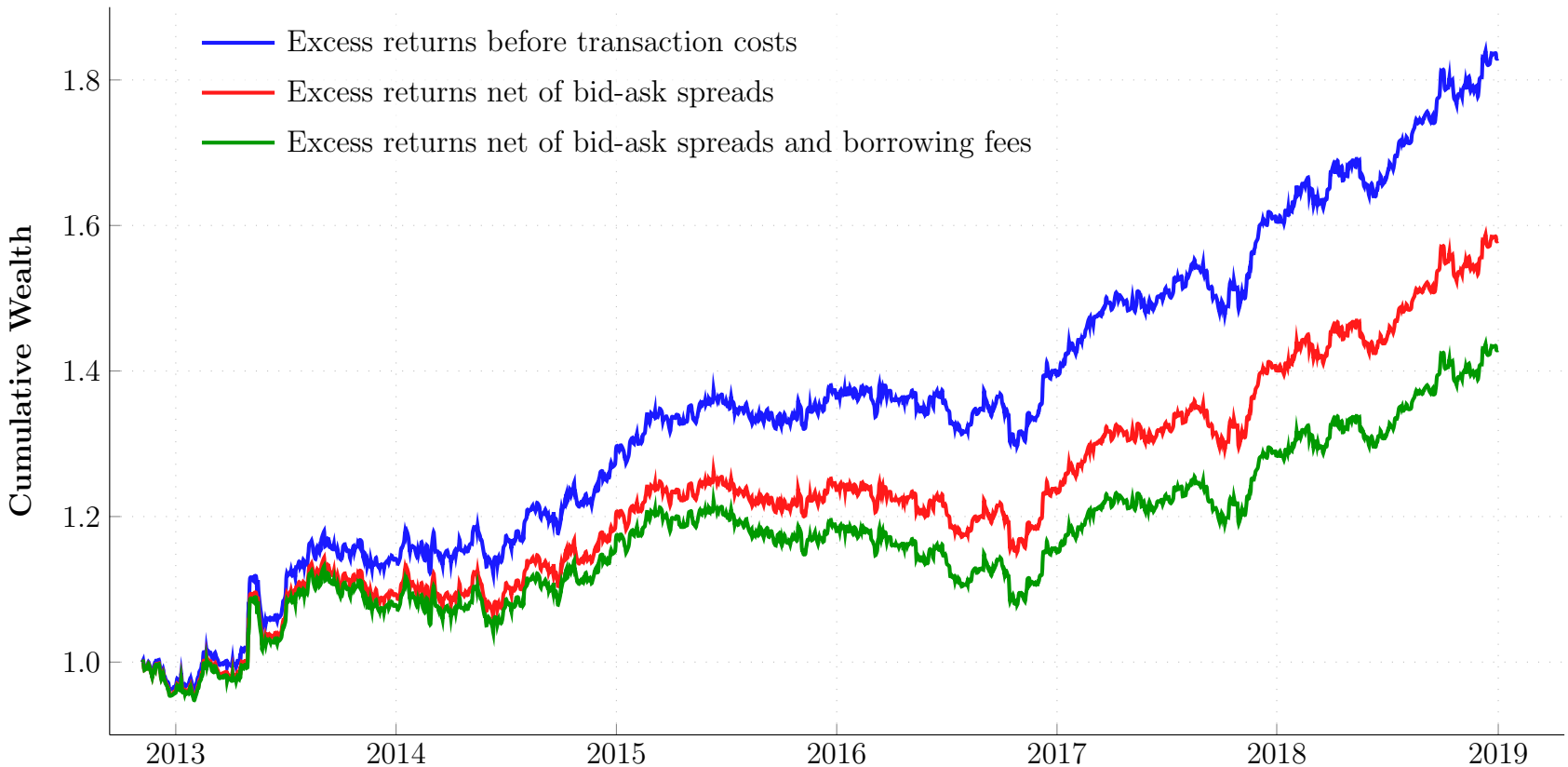
Characteristics of Conviction portfolios

A Descriptive Analysis

	P_1	P_2	P_3	P_4	P_5
Panel A: Firm Characteristics					
Leverage	1.37	1.43	1.25	1.24	1.04
Market Cap ($ billions)	3.11	6.48	5.26	5.25	4.04
Price-to-Book	2.52	2.50	2.87	2.81	2.74
Profitability (%)	1.85	2.76	2.39	2.04	1.97
Panel B: Risk Measures					
Short-selling Risk	1.56	1.58	2.11	2.16	2.79
Skewness	0.11	0.06	−0.01	0.04	0.00
Volatility (%)	39.52	37.26	36.89	37.24	39.27
Panel C: Liquidity Measures					
Amihud Illiquidity	0.78	0.01	0.01	0.01	0.01
Bid-Ask Spread (%)	0.45	0.29	0.29	0.25	0.25
Panel D: Securities Lending Market Variables					
Borrowing Fee (%)	2.88	2.63	2.40	2.31	3.09
Loan Supply (%)	9.30	9.68	9.60	9.23	8.25
Total Short Interest (%)	2.88	3.63	4.38	5.45	8.69
Panel E: Investor Attention Variables					
Institutional Ownership (%)	64.49	64.40	64.36	62.72	65.65
Analyst Coverage	13.75	17.48	16.47	17.73	18.21

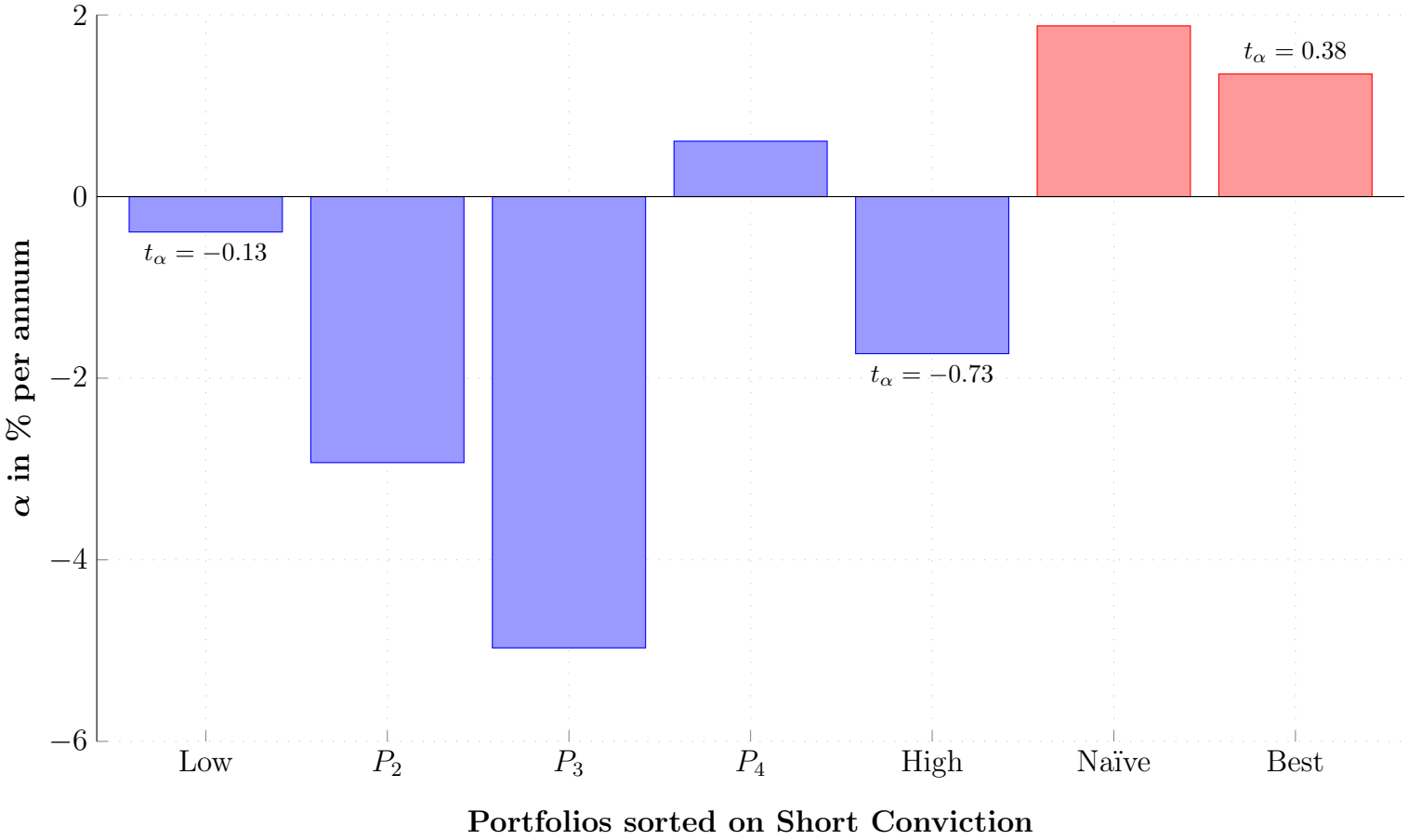
Accounting for Transaction Costs

Allocation subject to a Rebalancing Threshold



Portfolios sorted on Short Conviction (Other Investors)

Risk-Adjusted Excess Returns



Conclusions

- Public disclosure of short positions reveals **private information** and the **Best Short** monetizes this information,
- Results cannot be explained by traditional risk factors, intermediary capital risk, or short-selling risk,
- Robust to transaction costs, portfolio weighting, implementation delays, rebalancing frequency,
- We inform the policy debate on the *costs* of information disclosure.