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Sexy or safe: why do predicted stock issuers earn low returns?

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The evolution of empirical asset pricing models…

CAPM: $R_t = a + b(R_{m,t} - R_{f,t}) + e_{it}$

FF(1993): $R_t = a + b(R_{m,t} - R_{f,t}) + sSMB_t + hHML_t + e_{it}$

$SMB_t = (R_{s,t} - R_{b,t})$

A SIZE factor, defined as the monthly return on a hedge portfolio of small firms minus large firms.

[Liquidity risk? Information Costs?]

$HML_t = (R_{h,t} - R_{l,t})$

A VALUE factor, defined as the monthly return on a hedge portfolio of high B/M firms minus low B/M firms.

[Financial Distress? Mispricing?]

Although "empirically-inspired," these asset pricing models are useful in performance attribution. That is, to help explain variations in monthly returns:

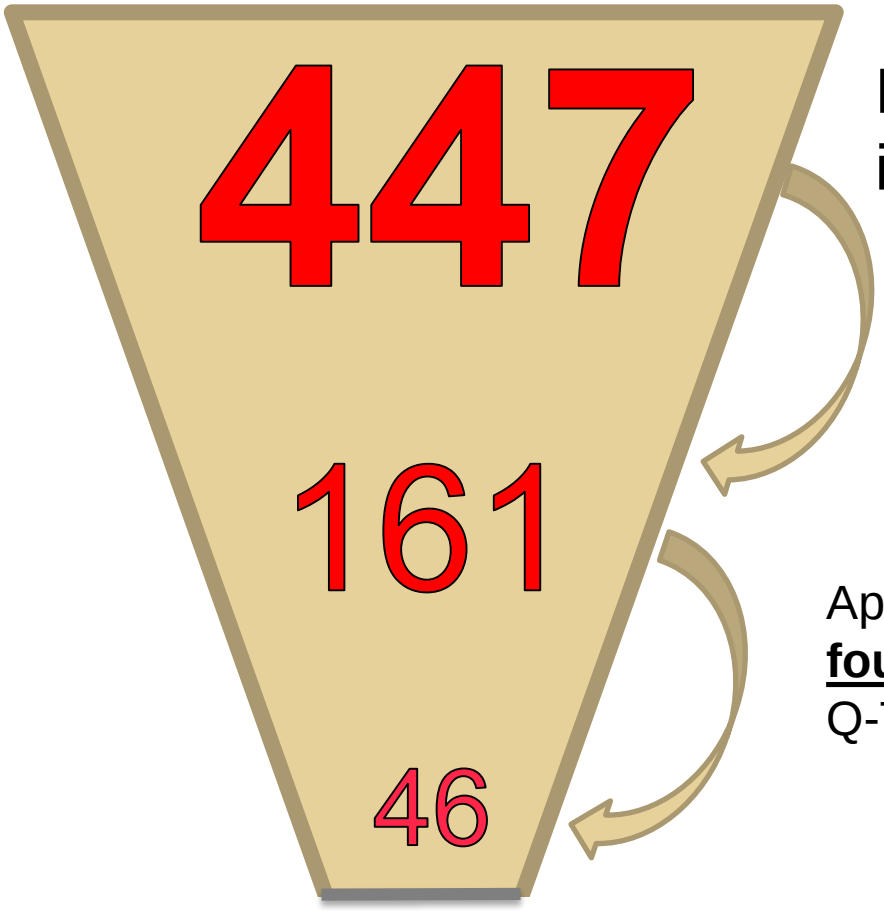
For example, Carhart (1997):

$$UMD_t = (R_{up,t} - R_{down,t})$$

$$R_{it} = a + bMKT_t + s\,SMB_t + h\,HML_t + m\,UMD_t + e_{it}$$

- Add a "Price Momentum" (Up-Minus-Down) factor when computing abnormal returns for mutual funds.
- Find that exposure to the UMD factor explains most of the outperformance by mutual fund managers.
- In other words, MF managers earn positive returns when returns to UMD factor is positive, and including UMD reduces "a"

Hou, Xue, Zhang (2017): Replicating Anomalies



Number of pricing anomalies identified by HXZ.

Apply liquidity constraints (NYSE size cutoffs; value-weighted portfolios); impose t > 3.

Apply the **new HXZ (2015) four factor model** based on Q-Theory

?

In the latest models, two "accounting" variables have acquired significant currency:

Hou, Xue, Zhang (2015a,b; "HXZ"):

"Investment" *"Profitability"*

$$R_t = a + b(R_{m,t} - R_{f,t}) + sSMB_t + iIA_t + rROE_t + e_{it}$$

Fama French (2015a,b; "FF-5") :

"Profitability" *"Investment"*

$$R_t = a + b(R_{m,t} - R_{f,t}) + sSMB_t + hHML_t + rRMW_t + cCMA_t + e_{it}$$

The addition of these two factors "largely summarizes" the cross section of average stock returns (i.e. they parsimoniously explain returns to many pricing anomalies).

What are these factors?

	Investment	**Profitability**
HXZ (2015a,b):	*Sort firms on annual* ***Asset Growth****:* $INV = \Delta A_t / A_{t-1}$ $IA_t = (R_{high,t} - R_{low,t})$	*Sort firms on* ***quarterly ROE*** $= EBXI_q / SE_{q-1}$ $ROE_t = (R_{high,t} - R_{low,t})$
FF (2015a,b):	*Sort firms on annual* ***Asset Growth****:* $INV = \Delta A_t / A_{t-1}$ $CMA_t = (R_{high,t} - R_{low,t})$	*Sort firms on* ***annual ROE*** $= EBXI_t / SE_{t-1}$ $RMW_t = (R_{high,t} - R_{low,t})$

What are these factors?

HXZ (2015a,b):

FF (2015a,b):

Investment

Sort firms on Annual Asset Growth:
INV = ΔA / A

$$CMA_t \text{ or } IA_t = (R_{high,t} - R_{low,t})$$

Profitability

Sort firms on Recent ROE = EBXI / SE

$$RMW_t \text{ or } ROE_t = (R_{high,t} - R_{low,t})$$

Notes:

- These factors are based on pure accounting variables. Unlike the earlier sort variables (SIZE, VALUE, MOM), these new sort variables have no market price in them.
- Directionally, “low-investment-high-profit” (LIHP) firms earn high future returns; “high-investment-low-profit” (HILP) firms earn low returns.

Okay, but why…?

- **What is the economic rationale for including these factors in asset pricing models?**
- **FF-5 and HXZ appeal to a pricing tautology:**
  - If stock prices are good proxies for the present value of firms' expected payoffs to shareholders, then "high-investment-low-profitability" (HILP) firms must have low price-implied discount rates.
  - Similarly "low-investment-high-profitability (LIHP) firms must have high price-implied discount rates.

FF(2015; Equation 2):

Under "Clean Surplus" Accounting, this is just = $DIV_{t+\tau}$

$$\frac{M_t}{B_t} = \frac{\Sigma_{\tau=1}^{\infty} E(Y_{t+\tau} - dB_{t+\tau})/(1+r)^{\tau}}{B_t}.$$

Where:

$Y_{t+\tau}$ = Earnings for period $t + \tau$

$dB_{t+\tau} = B_{t+\tau} - B_{t+\tau-1}$
is the change in total book equity

- **Translation: To rationalize their market prices, HILP firms must have *low market-implied discount rates*.**

Okay, but… why are investors willing to grant them these rates?

Two possibilities for the low market implied discount rate on HILP firms

Rational pricing

- HILP firms are “safer,” and have better future prospects, so investors rationally reward them with a lower implied cost-of-capital

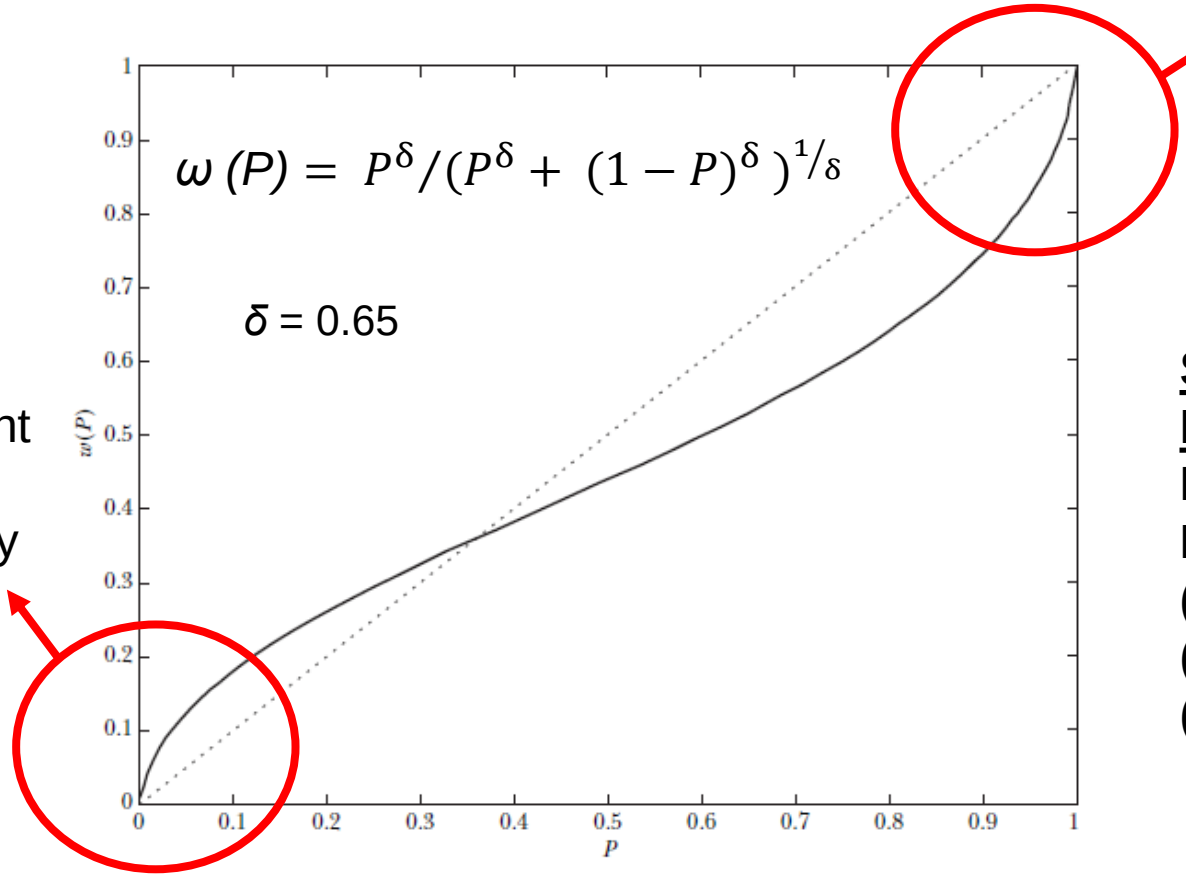
Systemic mispricing

- HILP firms are “sexier,” (more salient), leading to systemic over-pricing, and a lower implied cost-of-capital

Cumulative Prospect Theory & Probability Weights

Tversky Kahneman (1992): Probability weight exhibited by subjects is non-linear in P, the objective probability.

Subjects overweight the small probability events



Subjects overweight the small probability events

<u>Stocks as Lotteries</u>: Barberis Huang(2008); Eraker Ready (2015); Gao and Lin (2015); Barberis (2013) survey

Bordalo, Gennaioli, Shleifer (2013aAER; 2013b JPE): Saliency Theory

- Extreme payoffs are overweighed not because they have small probability, but because they are salient relative to the market payoff.
- Equilibrium pricing for the risky asset will be a function of its fundamentals as well as its saliency weight, ω_1.
- When an asset is downside salient, $\omega_1 < 1$; it is upside salient if $\omega_1 > 1$

Risky asset: $\{ x+G, \pi ; \quad x, (1-\pi)\}$

[Fundamental value = $x + \pi G$]

While for most stocks, downside saliency prevails, for some stocks, upside saliency is most prominent.

$$p = x + \omega_1 \pi G. \tag{6}$$

The risky asset is underpriced when downside is salient; and overpriced when upside is salient.

Two possibilities for the low market implied discount rate on HILP firms

Rational pricing

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Systemic mispricing

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Both predict lower future returns to HILP firms, but have almost polar opposite implications for what they should look like:

- HILP firms should be less risky (lower Beta, volatility, default rates, etc.)
- They should have positive NPV projects and improving fundamentals over time.

- HILP should be more "glamorous", and "salient" to investors
- Over time, their fundamental performance should disappoint (relative to current expectations).
- Rational arbitrageurs should try to bet against them (despite elevated costs)

We use predicted stock issuers (PSIs) as a proxy for *expected* HILP firms

We do this for two important reasons:

- **PSI is an excellent predictor of HILP**. There exists a direct link between expected HILP and the need to issue equity in the future (intuitively: firms that make high investments but have low/negative internally generated funds will have to raise capital). Thus predicting stock issuance is essentially predicting HILP. In fact, empirically we find predicting stock issuance is a better way to identify future HILP firms.

- **PSI captures saliency**. Predicted stock issuers (PSIs) are invariably salient, because they must by necessity engage the capital market and elevate their profile among investors. So high PSI firms fit the profile of attention-grabbing stocks described in the behavioral literature.

The direct link between PSI and HILP

$$A_t = L_t + SE_t \qquad (1)$$

$$A_{t-1} = L_{t-1} + SE_{t-1} \qquad (2)$$

$$\Delta A_t = \Delta L_t + \Delta SE_t \qquad (1) - (2)$$

$$\Delta SE_t = EARN_t + NetIssue_t$$

So,

$$\Delta A_t - EARN_t = \Delta L_t + NetIssue_t$$

Dividing both sides by A_{t-1}, we have:

$$\underbrace{INV_t - ROA_t}_{\text{“HILP” firms}} = \Delta L_t / A_{t-1} + \underbrace{SI_t}_{SI_t = NetIssue_t / A_{t-1}} \qquad (3)$$

Note that $INV_t = \Delta A_t / A_{t-1}$ is precisely the *Investment* variable in FF and HXZ, and that ROA_t closely tracks their *Profitability* variable.

Research Design

1. **Predict Stock Issuance**
   - Estimate a predictive model for net stock issuance using data available prior to portfolio formation
2. **Rank firms by their PSI score** into deciles as of June 30 of each year
3. **Valid that PSI** is capturing cross-sectional differences in future *investment* and *profitability (i.e. HILP)*
4. **Carefully document key characteristics of PSI firms:**
   - Future returns (raw and factor-adjusted)
   - Risk characteristics (size, volatility, beta, etc.)
   - Cash burn rates and failure frequency
   - Direction of future earnings surprises
   - Performance during down markets
   - Distribution of returns pre- and post-formation
   - Evidence of more binding arbitrage constraints

Predicting Stock Issuance

$$si_{i,t+1} = \beta_0 + \beta_1 roa_{i,t} + \beta_2 si_{i,t} + \beta_3 lnsize_{i,t} + \beta_4 mb_{i,t} + \beta_5 mom_{i,t} + \epsilon_{i,t}$$

- $roa_{i,t}$ - Low profit firms more likely to issue (Hou et al., 2015b)
- $si_{i,t}$ - Seasoned equity issuers tend to issue repeatedly (Brav, Geczy, and Gompers (2000) and Billett, Flannery, and Garfinkel (2011))
- $mb_{i,t}$ - Firms more likely to issue when their stock prices are relatively high (Baker and Wurgler, 2002; Dittmar and Thakor, 2007)
- $mom_{i,t}$ - Market receptivity is important to timing of issuance (Alti and Sulaeman 2012)
- $lnsize_{i,t}$ - Smaller firms more likely to have large net issuances

Predicting Stock Issuance

Appendix 2: Five-year rolling regressions

	Predicted	-	+	-	+	+		
Estimation period	Intercept	roa	si	lnsize	mb	mom	R2	N
1972-1976	-0.004	-0.129	0.212	-0.001	0.002	0.006	0.162	12230
1973-1977	-0.003	-0.140	0.223	-0.001	0.002	0.005	0.185	13910
1974-1978	-0.003	-0.138	0.275	-0.001	0.003	0.005	0.203	14723
2002-2006	0.012	-0.182	0.251	-0.004	0.004	0.029	0.348	15478
2003-2007	0.017	-0.234	0.246	-0.005	0.004	0.033	0.396	15626
2004-2008	0.017	-0.258	0.201	-0.005	0.003	0.034	0.375	16046
2005-2009	0.011	-0.239	0.202	-0.004	0.002	0.024	0.367	16282
2006-2010	0.007	-0.222	0.217	-0.003	0.002	0.019	0.364	15867
2007-2011	0.006	-0.231	0.233	-0.003	0.002	0.019	0.391	16616
Average	0.001	-0.200	0.159	-0.003	0.007	0.032	0.313	
t-statistic	0.26	-14.95	7.19	-6.72	7.28	7.60		

Table 1: Firm Characteristics by PSI Decile

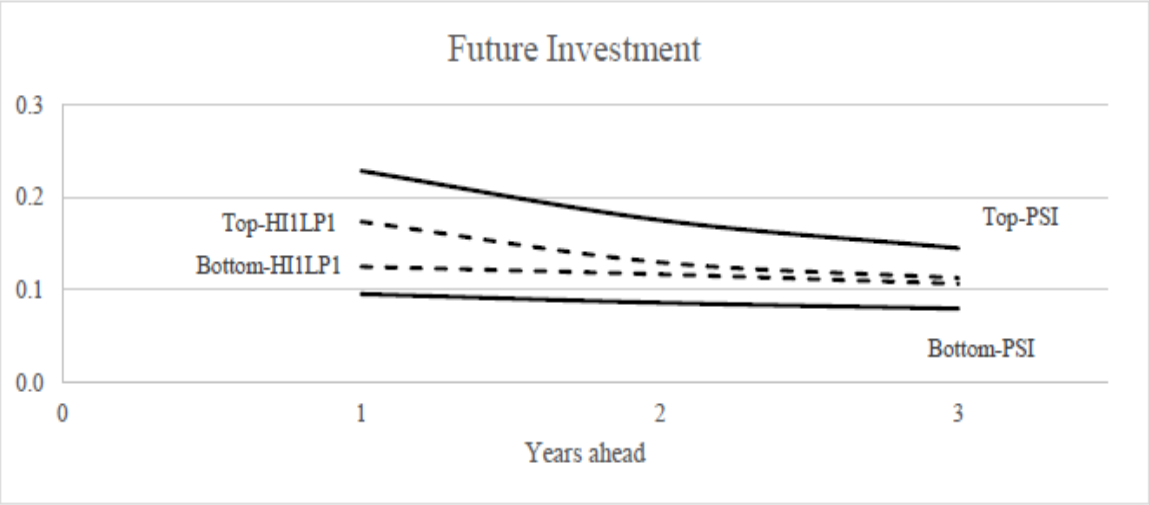
Descriptive Statistics for Year t-1 (most recent fiscal year end before formation)

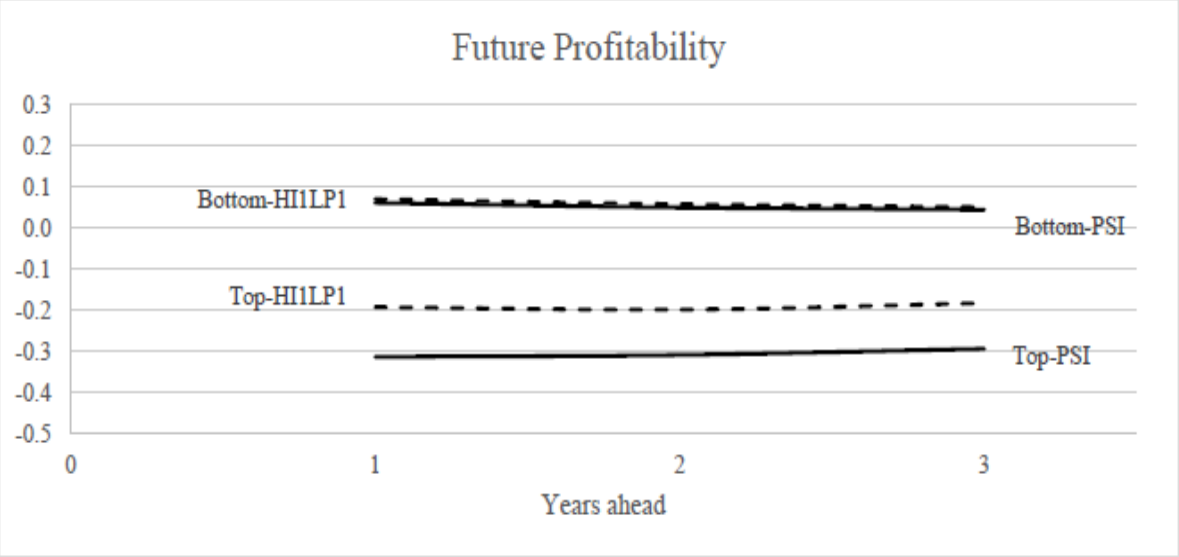
Panel A: Descriptive statistics by predicted stock issuance (PSI) decile

Decile	1	2	3	4	5	6	7	8	9	10	10-1 Sig.
Avg yr t-1 PSI	-0.061	-0.026	-0.015	-0.009	-0.002	0.006	0.021	0.049	0.113	0.318	0.379 ***
Pct si >0 in yr t-1	0.131	0.174	0.229	0.283	0.339	0.394	0.468	0.567	0.675	0.820	0.689 ***
roa	0.110	0.071	0.057	0.048	0.040	0.030	0.019	-0.005	-0.063	-0.332	-0.441 ***
size	2945	2591	1905	1348	977	768	635	535	477	245	-2700 ***
mb	2.408	1.975	1.837	1.794	1.805	1.920	2.128	2.532	3.648	7.560	5.152 ***
mom	-0.062	-0.026	0.008	0.040	0.076	0.114	0.165	0.219	0.253	0.233	0.295 ***
inv	0.131	0.134	0.136	0.146	0.156	0.169	0.205	0.277	0.428	0.678	0.547 ***
instit_hldgs	0.465	0.456	0.439	0.413	0.381	0.342	0.311	0.290	0.276	0.207	-0.258 ***
beta	0.860	0.864	0.871	0.896	0.930	0.932	0.954	1.023	1.118	1.054	0.195 ***
volatility	0.026	0.026	0.027	0.029	0.031	0.034	0.037	0.042	0.047	0.054	0.028 ***
short_int	0.025	0.021	0.022	0.024	0.023	0.022	0.020	0.022	0.027	0.035	0.010 ***
N	13802	13824	13829	13819	13817	13831	13822	13826	13827	13807	

Top-PSI firms are small, loss-making companies with high MB & positive MOM. They also have low Inst ownership, hi beta, hi-vol & high short-interest.

Figure 1: Future Profitability & Investment





PSI good proxy for expected HILP

PSI is better at predicting the spread in future investment and future profitability than various other sorts based on combinations of their current investment and profitability using different weightings on HI and LP (i.e. HIxLPy) measures.

Summary: Top PSI Firms

- Earn low future returns (T-bond like over 36 years)
- Are smaller, have high-volatility, high Beta, fat-tailed distributions and lottery-like payoffs
- They are cash-strapped and most will need additional financing even without new CAPEX; Their failure rate is almost 10X higher & they do badly in down markets
- Average ROA over next two years is -30%, but average asset growth is +20% per year
- They report disappointing earnings (short-window earnings announcement returns, forecast errors, and revisions)
- Their return distribution, post-formation, shifts sharply to the left.
- They are much more likely (6X) to face binding short-sale constraints

Table 3. Future Returns by PSI Decile

Panel A: Equal-weighted returns

Decile	1	2	3	4	5	6	7	8	9	10	10-1	Sig.
Raw buy-and-hold returns												
Year 1	0.166	0.167	0.177	0.169	0.176	0.174	0.164	0.169	0.144	0.064	-0.102	**
Year 2	0.166	0.173	0.174	0.174	0.168	0.164	0.174	0.157	0.151	0.062	-0.104	**
Year 3	0.163	0.152	0.162	0.173	0.165	0.158	0.159	0.159	0.140	0.072	-0.091	**
Buy-and-hold returns in excess of ten-year treasury bond annualized yields												
Year 1	0.101	0.103	0.113	0.104	0.112	0.110	0.100	0.104	0.080	0.000	-0.102	**
Year 2	0.102	0.109	0.109	0.110	0.104	0.099	0.109	0.093	0.087	-0.002	-0.104	**
Year 3	0.099	0.088	0.098	0.109	0.100	0.094	0.095	0.094	0.076	0.008	-0.091	**

Panel B: Value-weighted returns

Decile	1	2	3	4	5	6	7	8	9	10	10-1	Sig.
Raw buy-and-hold returns												
Year 1	0.154	0.124	0.126	0.130	0.144	0.160	0.132	0.140	0.099	0.046	-0.108	**
Year 2	0.152	0.142	0.128	0.161	0.134	0.154	0.140	0.140	0.103	0.071	-0.081	**
Year 3	0.134	0.143	0.113	0.151	0.145	0.125	0.138	0.132	0.128	0.135	0.001	
Buy-and-hold returns in excess of ten-year treasury bond annualized yields												
Year 1	0.089	0.059	0.062	0.066	0.080	0.095	0.068	0.075	0.035	-0.018	-0.108	**
Year 2	0.088	0.077	0.063	0.096	0.070	0.089	0.076	0.076	0.038	0.007	-0.081	**
Year 3	0.070	0.079	0.049	0.087	0.081	0.061	0.074	0.067	0.063	0.071	0.001	

Table 4. Future Returns by PSI Decile (Issuers vs. Non-Issuers)

Equal-weighted returns for future issuers and non-issuers

PSI Decile	1	2	3	4	5	6	7	8	9	10	10-1	Sig.
Actual yr t issuers	0.134	0.162	0.206	0.256	0.299	0.348	0.395	0.468	0.542	0.662	0.528	***
Panel A: Raw buy-and-hold returns for future issuers												
Year 1	0.158	0.153	0.162	0.145	0.171	0.180	0.168	0.163	0.139	0.065	-0.093	**
Year 2	0.168	0.168	0.162	0.173	0.169	0.146	0.169	0.134	0.139	0.046	-0.121	***
Year 3	0.173	0.153	0.160	0.157	0.156	0.147	0.149	0.144	0.131	0.065	-0.107	***
Panel B: Raw buy-and-hold returns for future non-issuers												
Year 1	0.167	0.168	0.179	0.174	0.175	0.173	0.168	0.177	0.155	0.074	-0.092	*
Year 2	0.163	0.173	0.175	0.174	0.166	0.172	0.178	0.181	0.171	0.098	-0.065	
Year 3	0.162	0.151	0.159	0.179	0.166	0.162	0.165	0.173	0.152	0.083	-0.079	**
Panel C: Difference (Issuers minus Non-issuers)												
Year 1	-0.008	-0.015	-0.017	**-0.029**	-0.004	0.008	0.000	-0.014	-0.016	-0.009		
Year 2	0.005	-0.006	-0.014	-0.001	0.003	-0.026	-0.009	**-0.047**	-0.031	**-0.051**		
Year 3	0.011	0.002	0.001	-0.022	-0.010	-0.015	-0.016	-0.030	-0.021	-0.018		

Top-PSI firms earn low returns whether or not they actually issue stocks in year t.

Table 5. Monthly Return Regressions

L = long the bottom-PSI decile stocks
S = short the top-PSI decile stocks

Fama French (1993) 3-factor Model:

$$R_t = a + b(R_{m,t} - R_{f,t}) + sSMB_t + hHML_t + e_{it}$$

The PSI hedge portfolio is negative Beta, negative Size, and Positive Value

Panel B: Fama-French Three Factor Model (FF-3)

Value-Weighted Portfolios

	a	b	s	h	t(a)	t(b)	t(s)	t(h)
L	0.0022	0.8686	-0.0900	0.1690	2.53	42.26	-2.97	5.5
S	-0.0088	1.3494	0.7060	-0.7460	-4.22	27.9	9.89	-10.31
L-S	0.0110	-0.4808	-0.7960	0.9149	4.88	-9.16	-10.28	11.66

Equal-Weighted Portfolios

	a	b	s	h	t(a)	t(b)	t(s)	t(h)
L	0.0013	0.8675	0.6471	0.2228	2.36	65.76	33.24	11.29
S	-0.0076	1.0802	1.4159	-0.5948	-3.92	23.92	21.24	-8.8
L-S	0.0089	-0.2126	-0.7688	0.8176	4.52	-4.62	-11.32	11.87

Controlling for FF-3 factors, the average monthly abnormal return to the PSI hedge portfolio is around 1.1% per month.

Table 5. Monthly Return Regressions

Fama French (2015) 5-factor Model:

"Profitability" *"Investment"*

$$R_t = a + b(R_{m,t} - R_{f,t}) + sSMB_t + hHML_t + rRMW_t + cCMA_t + e_{it}$$

Panel C: Fama-French Five Factor Model (FF-5)

Value-Weighted Portfolios

	a	b	s	h	r	c	t(a)	t(b)	t(s)	t(h)	t(r)	t(c)
L	0.0016	0.8896	-0.0882	0.0825	0.0524	0.1844	1.72	41.17	-2.72	1.96	1.22	2.92
S	-0.0031	1.2286	0.4491	-0.4107	-1.0348	-0.5062	-1.66	27.56	6.71	-4.74	-11.7	-3.89
L-S	0.0047	-0.3390	-0.5373	0.4932	1.0873	0.6906	2.29	-6.98	-7.37	5.22	11.28	4.87

Equal-Weighted Portfolios

	a	b	s	h	r	c	t(a)	t(b)	t(s)	t(h)	t(r)	t(c)
L	0.0007	0.8818	0.6736	0.1807	0.1107	0.0685	1.2	64.2	32.69	6.76	4.06	1.71
S	-0.0031	1.0060	1.1114	-0.4859	-1.0720	0.0198	-1.83	25.27	18.61	-6.28	-13.58	0.17
L-S	0.0038	-0.1242	-0.4378	0.6666	1.1827	0.0487	2.28	-3.17	-7.46	8.76	15.23	0.43

The average monthly abnormal return to the PSI hedge portfolio drops to around 0.4% per month.

As expected, PSI returns are positively correlated with RMW and CMA returns

Table 5. Monthly Return Regressions

Hou, Xue, Zhang (2015) Q-Model:

"Investment" *"Profitability"*

$$R_t = a + b(R_{m,t} - R_{f,t}) + sSMB_t + hHML_t + iIA_t + rROE_t + e_{it}$$

Panel D: Hou, Xue, Zhang (2015a) Q-factor Model

Value-Weighted Portfolios

	a	b	s	i	r	t(a)	t(b)	t(s)	t(i)	t(r)
L	0.0026	0.8604	-0.1236	0.2449	-0.0966	2.80	40.26	-4.06	4.98	-2.74
S	-0.0018	1.2967	0.4532	-0.9561	-0.8352	-0.84	26.90	6.60	-8.61	-10.50
L-S	0.0044	-0.4363	-0.5768	1.2010	0.7386	1.81	-7.90	-7.33	9.44	8.10

Equal-Weighted Portfolios

	a	b	s	i	r	t(a)	t(b)	t(s)	t(i)	t(r)
L	0.0019	0.8461	0.5763	0.1971	-0.1130	2.95	57.63	27.54	5.83	-4.66
S	-0.0018	1.0463	1.1549	-0.6191	-0.8837	-0.88	22.97	17.79	-5.90	-11.76
L-S	0.0037	-0.2002	-0.5786	0.8162	0.7707	1.69	-4.07	-8.26	7.21	9.50

Again, average monthly abnormal return to the PSI hedge portfolio drops to around 0.4% per month, this time insignificant.

As expected, PSI returns are positively correlated with IA and ROE returns

Bottom Line: Investment and Profitability factors summarize most of the monthly variation in PSI-hedge returns

The evidence so far…

A. Top-PSIs are future HILP firms

B. They earn extremely low returns

C. Their monthly returns are largely explained by the new *investment* and *profitability* factors

D. They are not safer by standard metrics

To better understand the HILP phenomenon, we will now carefully document the most salient features of top-PSI firms.

Who are these guys (top PSI firms)?

ZGNA, video game developer, was a top-PSI decile firm on June 2012

Creator of ***Farmville***, a popular Facebook game with 250MM+ monthly active users at its peak

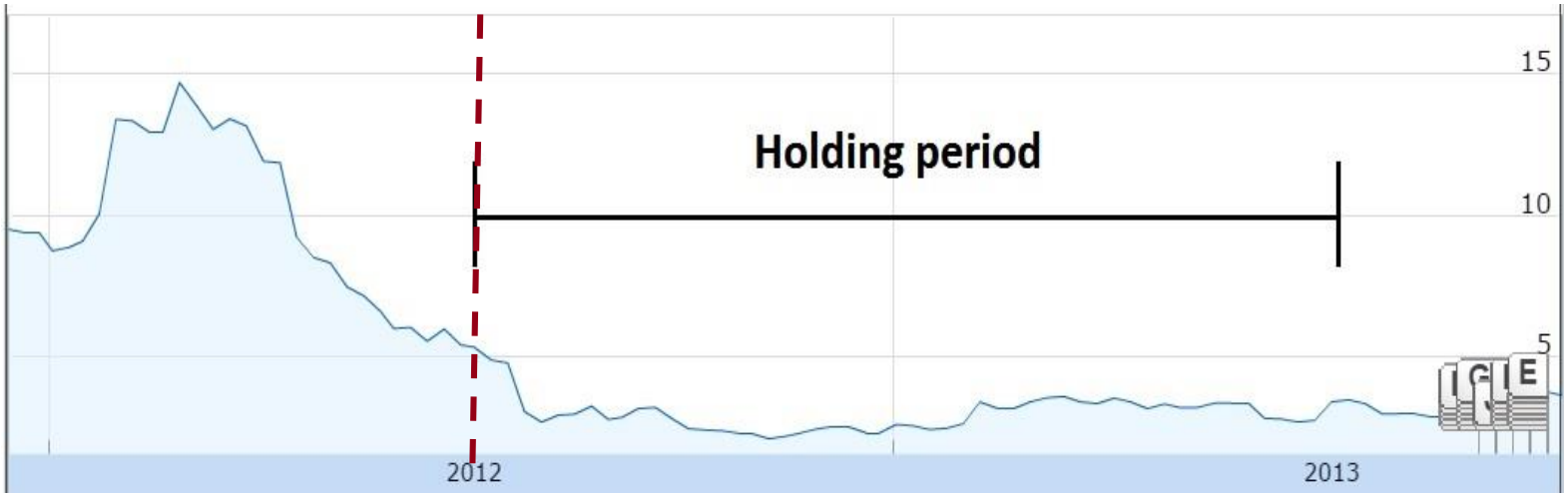
- 2011 Profitability: -16.1 percent ROA
- 2011 Investment: +25 percent Investment (2010 assets 1,113MM → 2011 assets 2,516MM)
- 2011 Stock issuance: 46.3 percent (IPO year)

Case Study: Zynga (ZNGA)

- In early 2012, multiple investment banks initiated coverage with an overweight recommendation
  - Morgan Stanley: "Zynga is the *clear leader* in U.S. social gaming, with sustainable competitive advantages built through its leadership position." (January 25, 2012)
  - JP Morgan: "Big games release slate in 2012…" (January 25, 2012)
- In early 2012, near peak share price, Zynga completed acquisition of OMGPOP and issued a secondary offering (Business Insider)

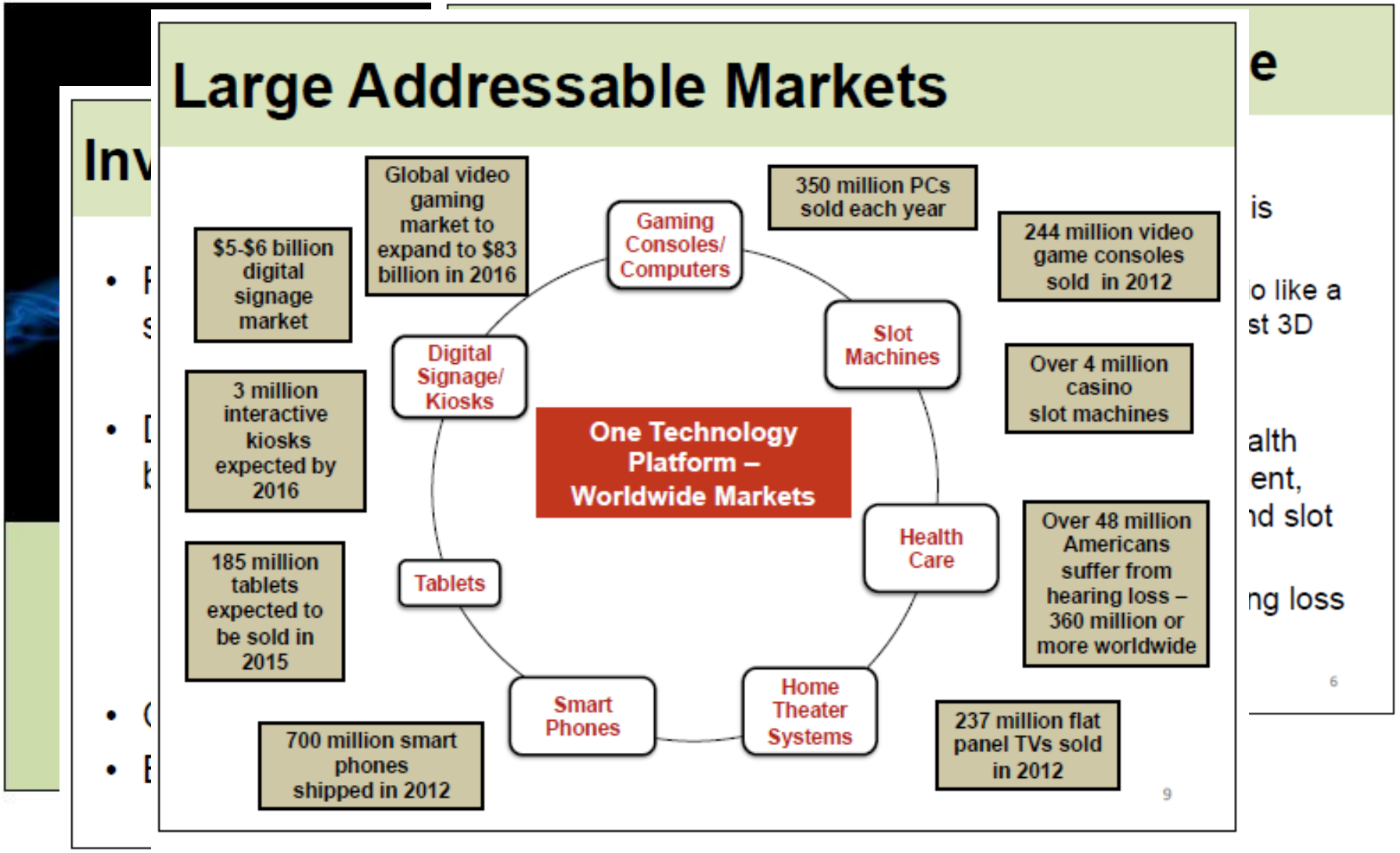
Case Study: Zynga (ZNGA)

- Peak valuation was over $20B ($15 per share).
- Entered the top-PSI portfolio in June 2012.
- Return for July 2012-June 2013: -48.8 percent



Parametric Sound Corp. (PAMC)

Entered the top-PSI decile in June 2013.



Many Biotechnology Firms

Sample of top-decile PSI Biotech Firms from June 2013

Year t+1 Profit & Growth Statistics

	ROA	*SI*	*SIZE*	*MB*	*ROA1*	*INV1*	*SI1*
ROCK CREEK PHARMACEUTICALS	-0.57	0.95	231	17.84	-1.16	-0.54	0.64
DURATA THERAPEUTICS INC	-0.72	0.95	192	3.20	-0.62	0.16	0.54
REPROS THERAPEUTICS INC	-0.68	0.95	424	11.73	-0.35	1.94	0.64
ALEXZA PHARMACTCLS INC	-0.69	0.87	75	23.32	-0.84	0.16	0.14

- **Large losses in year t**
- **Raised large amounts of equity**
- **Small size; High MB**

- **Typically they keep losing yet keep growing in year t+1**

Typically heavy self-promoters. Repros: Held 13 investor events/presentations and webcasts in 12 months.

Table 6. Cash Burn & Delisting

	Low-PSI (Long)	High-PSI (Short)	L-S	Sig.
Current year Cash Holdings	0.166	0.364	-0.198	***
Profitability				
Current year EBITDA	0.201	-0.213	0.413	***
One-year ahead EBITDA	0.161	-0.208	0.369	***
Two-year ahead EBITDA	0.149	-0.191	0.340	***
One-year-ahead cash	0.158	0.327	-0.169	***
Pro Forma Cash				
One-year ahead-cash, assuming no financing	0.196	0.129	0.067	***
One-year ahead-cash, no financing, constant capex	0.194	0.125	0.069	***
One-year-ahead % firms out of cash, no financing	0.121	0.347	-0.226	***
Median cash deficit when cash < 0 , 1 year	-0.089	-0.220	0.132	***
Two-year ahead-cash, assuming no financing	0.229	-0.047	0.276	***
Two-year ahead-cash, no financing, constant capex	0.224	-0.064	0.288	***
Two-year-ahead % firms out of cash, no financing	0.140	0.519	-0.379	***
Median cash deficit when cash < 0, 2 years	-0.068	-0.202	0.134	***
Delistings over next year				
Proportion of firms delisted for any reason in Yr t	0.048	0.114	-0.065	***
Proportion of firms delisted for performance reasons	0.008	0.077	-0.069	***

Top PSI firms hold more cash to start with, but they quickly use them up over the next two years.

Most will be out of cash within two years even without new capex.

They are also 9X more likely to delist for performance reasons.

Table 7. Performance in Down Markets

	L	S	L-S	t-stat	N
Average monthly return (percentage)	1.22	0.30	0.92	2.76	432
Monthly return when market return < 0	-2.65	-7.57	4.92	9.24	155
Monthly return during NBER recessions	0.22	-0.74	0.96	0.92	61
Average three-month return (percentage)	3.68	0.99	2.69	4.12	430
Average 3-month return when 3-month market return < 0	-3.34	-15.49	12.15	10.00	134
Average 3-month return during NBER recessions	-0.42	-4.77	4.35	1.90	61

Contrary to the risk-based explanation, these firms are not a good hedge against bad times.

[Note, however, this result is consistent with the Saliency Theory advanced by BGS (for stocks with extreme payoffs, downside (upside) saliency dominates in busts (boom)).]

Table 8. Future Earnings News

Panel A: Earnings announcement returns (EAret)	L	S	L-S	Sig.
Average two-day EA returns over next 8 quarters	0.255	-0.735	0.990	***

Panel B: Future forecast errors (FE)	L	S	L-S	Sig.
Average 1-yr ahead forecast error	-0.025	-0.094	0.070	***
Average 2-yr ahead forecast error	-0.040	-0.145	0.105	***

Panel C: Future estimate revisions (REV)	L	S	L-S	Sig.
Average 1-yr ahead forecast revision	-0.012	-0.037	0.025	***
Average 2-yr ahead forecast revision	-0.028	-0.094	0.067	***

Top PSIs report disappointing earnings over the next two years (measured three different ways)

- ***Short-window earnings announcement returns***
- ***Reported EPS – Consensus Forecast EPS***
- ***Average EPS Revisions over next year***

Table 8. Future Earnings News

Panel D: Multivariate analysis of forecast errors, revisions, and announcement returns

	One year ahead			Two years ahead		
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	FE1	EAret1	REV1	FE2	EAret2	REV2
Long	0.370	-0.128	0.242**	-0.317	-0.0101	-0.330*
	(1.46)	(-1.41)	(2.14)	(-1.00)	(-0.13)	(-1.92)
Short	-5.263***	-0.930***	-2.448***	-6.430***	-1.029***	-4.937***
	(-6.57)	(-3.29)	(-6.47)	(-4.58)	(-4.14)	(-5.18)
Mom	6.627***	0.228***	2.743***	9.289***	0.140***	5.786***
	(7.73)	(3.63)	(6.52)	(8.12)	(2.99)	(7.89)
Lnsize	1.833***	0.000117	0.572***	2.549***	-0.0208	1.336***
	(12.88)	(0.01)	(11.38)	(13.12)	(-0.77)	(12.62)
MB	0.214***	-0.0109	0.0883***	0.173**	-0.0183	0.116**
	(3.19)	(-0.74)	(3.00)	(2.20)	(-1.50)	(2.16)
Observations	84,303	112,182	79,628	71,043	102,674	66,966
R-squared	0.076	0.005	0.067	0.083	0.005	0.083
Constant	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Clustering	F & Y	F & Y	F & Y	F & Y	F & Y	F & Y
Test of difference between coefficients in long and short portfolios						
Long - Short	5.633	0.802	2.69	6.113	1.019	4.607
(F-stat)	(35.68)***	(7.99)***	(41.88)***	(17.90)***	(18.59)***	(22.82)***

Post-formation Returns

Low-PSI firms vs High-PSI firms

Figure 2A – Post One-year Return Distribution

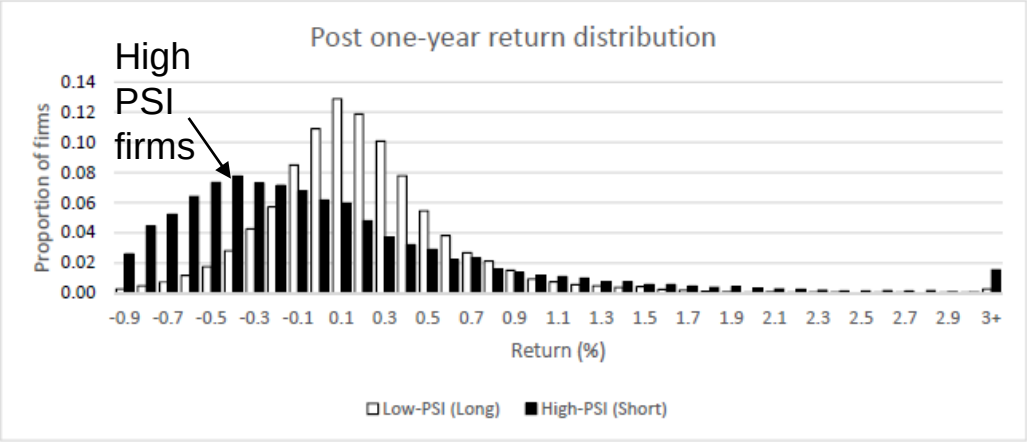
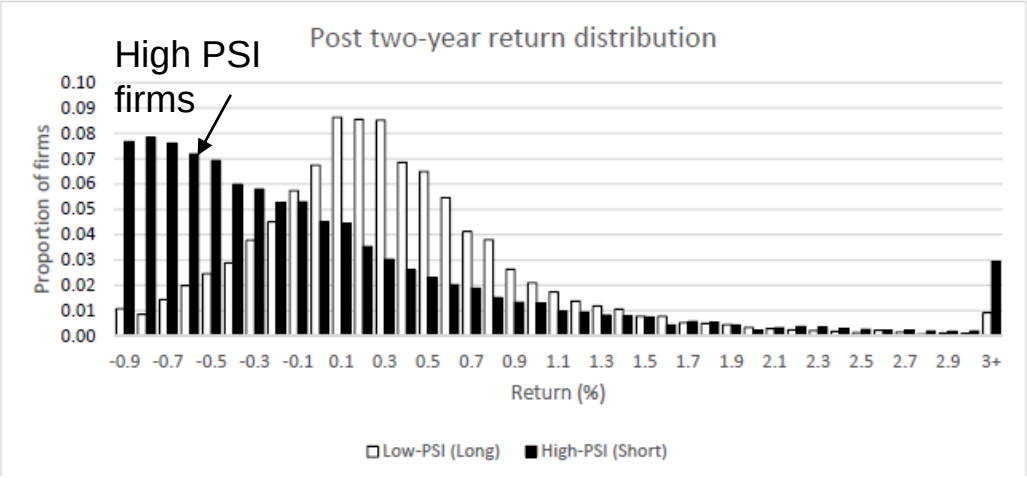


Figure 2B – Post Two-year Return Distribution



Post-formation returns for high-PSI firms feature much lower mean, but also much higher variance and many more extreme outcomes.

Pre- vs. Post-formation Returns

Figure 3A – Returns for Top-PSI firms: Prior-two-year versus Post-two-year

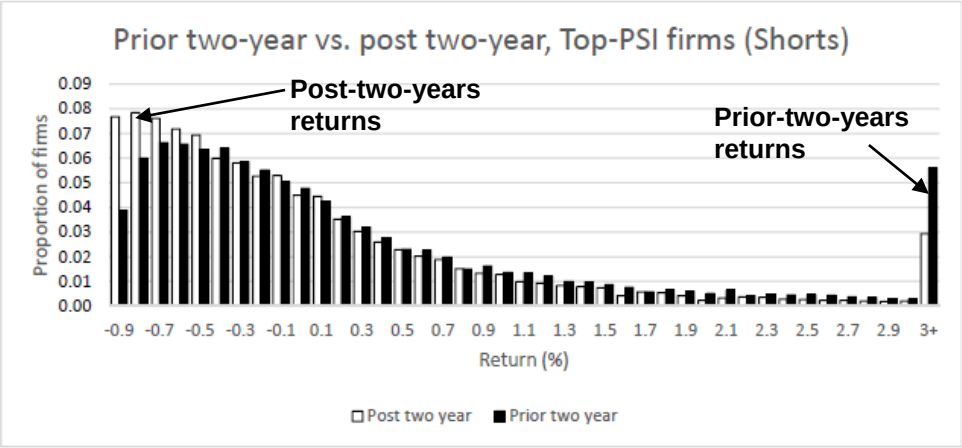
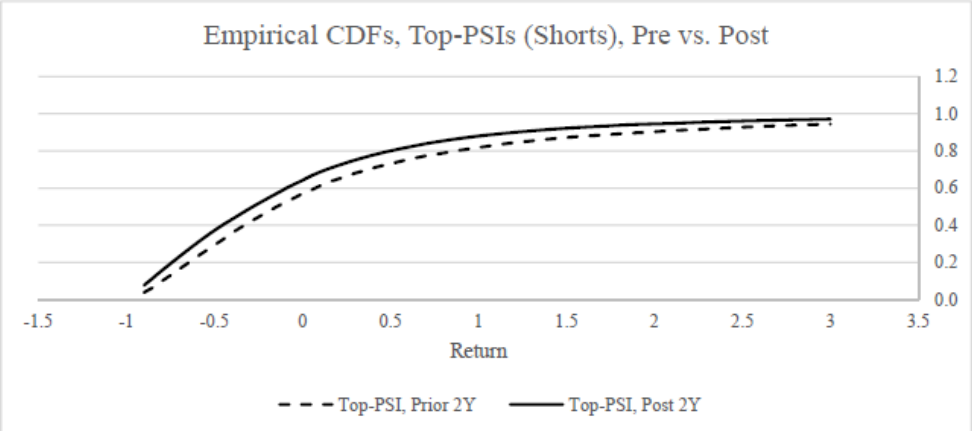


Figure 3B – Empirical CDFs for Top-PSI firms: Prior-two-year versus Post-two-year



Compared to their own pre-formation returns, the post-formation returns of high-PSI firms "shifts to the left".

For high-PSI firms, their pre-formation returns "stochastically dominate" their post-formation returns

Shorting Costs

Top-PSI firms are 6X more likely to be “hard-to-borrow”

Only 6% of low-PSI firms are on “special,” compared to over 38% of the top-PSI firms

Summary: Top PSI firms

- Earn low future returns (T-bond like over 36 years)
- Are smaller, have high-volatility, high Beta, fat-tailed distributions and lottery-like payoffs
- They are cash-strapped and most will need additional financing even without new CAPEX; Their failure rate is almost 10X higher & they do badly in down markets
- Average ROA over next two years is -30%, but average asset growth is +20% per year
- They report disappointing earnings (short-window earnings announcement returns, forecast errors, and revisions)
- Their return distribution, post-formation, shifts sharply to the left.
- They are much more likely (6X) to face binding short-sale constraints

Key Implications

1. These results imply the “risk premium” on these two new factors have *the wrong sign* (the safer firms are earning higher returns)

2. The average payoff on these factors reflect compensation to “active” investors who extend the supply of these assets by, for example, shorting them.

3. Many of the other anomalies they “explain” are probably also due to mispricing rather than compensation for bearing exposure to other structural macroeconomic risk.

4. Time-varying payoffs to *Investment* and *Profitability* probably have more to do with constraints facing arbitrageurs (i.e. deleveraging risk in active asset management), and less to do with exposure to fundamental macroeconomic factors (as suggested by rational asset pricing models)

How can this be equilibrium?

1. There must be persistently strong (non-fundamental; noise trader) demand for these types of salient assets. *[Could be "rational" if it is preference-based?]*

2. The amount of "smart money" (fundamental-based traders) that should supply these assets must face significant constraints.

Lee and So (2015): "Alphanomics: the informational underpinnings of market efficiency"

Chapter 5: A Taxonomy of Arbitrage Costs

✓ **1. Information Costs/Constraints**
- Identifying and verifying a mispricing.
- Data complexities; competitive and dynamic landscape; overcrowding (Stein 2009)

✓✓ **2. Implementation Costs/Constraints**
- Trading Costs; Price pressure (scalability)
- Shorting costs (availability, fees)
- Availability of near-substitute assets

✓✓✓ **3. Funding Costs/Constraints**
- The risk that your source of capital will dry up precisely when the strategy is most likely to payoff (Shleifer and Vishny 1997)

Funding Constraints can be Devastating for Active Asset Managers (including those who bet against PSIs)

Dichev (2007 AER):

Dollar-weighted Returns are much lower than Buy-and-Hold Returns

- Nasdaq: BH Ret – DW Ret = 9.6% – 4.3% = 5.3%
- NYSE/AMEX: 9.9% - 8.6% = 1.3%
- Same pattern in 18 out of 19 countries (except Canada)

Dichev and Yu (2011 JFE):

This gap between BH Ret and DW Ret is even wider for hedge funds

Active Mangers who use leverage and take short positions will be most vulnerable to deleveraging risk ("liquidity spirals").

Funding Constraints as a State Variable

There is growing awareness among financial academics that returns to factor-based portfolios are correlated with funding or financing problems in the world of active investing.

Theoretical Studies:

He & Krishnamurthy (2013), Cespa & Foucault (2014), Brunnermeier & Pedersen (2009)

- Basic idea: when arbitrage capital is scarce, active investors face deleveraging risk, which can cause otherwise unrelated strategies (value, momentum, profitability, investment, event-arbitrage, FX carry trades) to simultaneously underperform.

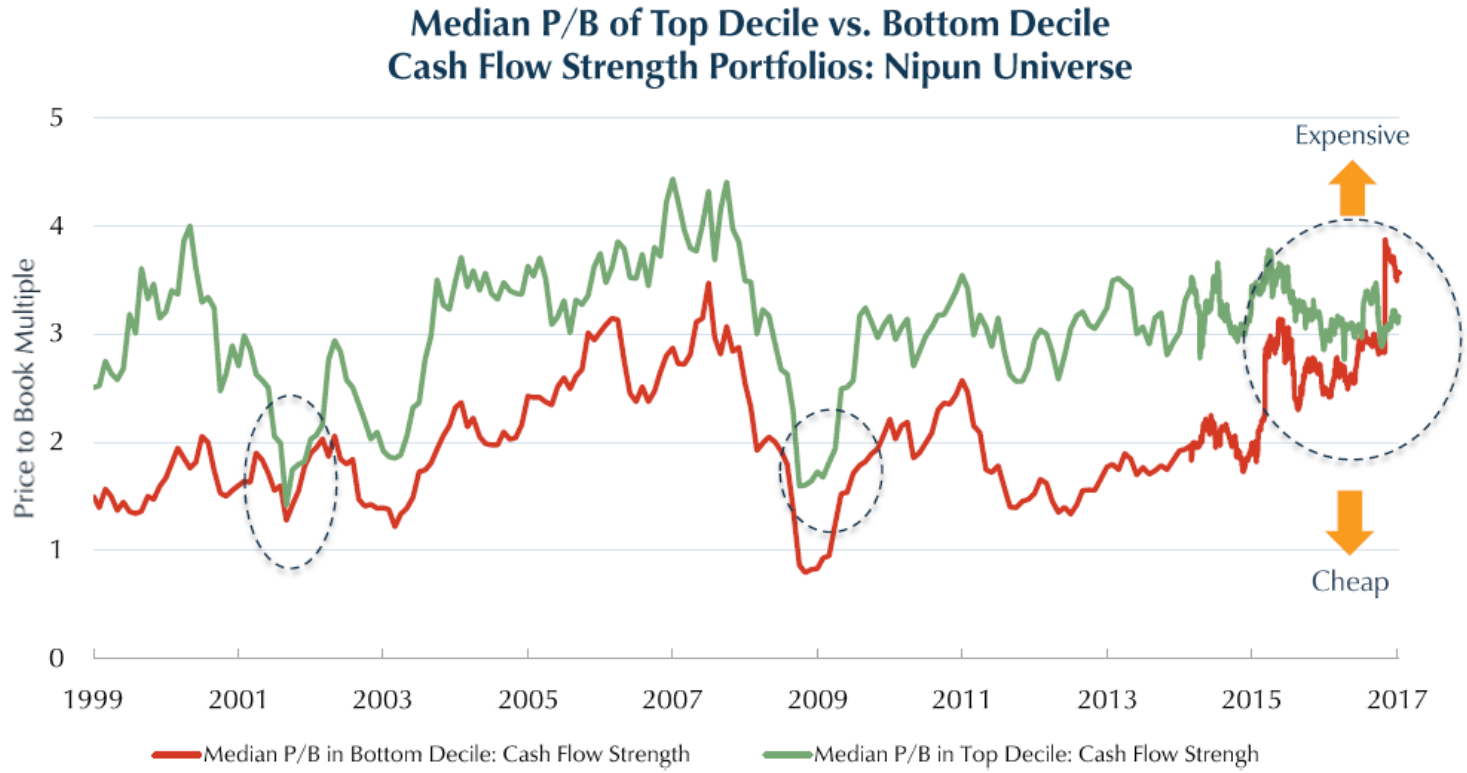
Empirical Studies:

Different measures of the tightness of funding constraints

- Hu, Pan & Wang (2013) – US Treasury Bond Pricing
- Sadka (2014), Pastor & Stambaugh (2003) – Price Impact
- Adrian et al. (2013) – Book leverage of broker-dealers
- Nyborg and Ostberg (2014) – Overnight interbank loan spreads
- Coval and Stafford (2007) – Flow induced sales & purchases

Asset Pricing in the Asia X-Japan Universe (11 countries)

Significant Mispricing Across Asia



Source: Nipun Capital, LP

Summary

We develop a predictive model for stock issuance, and show that predicted stock issuers (PSI firms) earn unusually low returns

- **We argue PSI is an excellent predictor of HILP**. In fact, empirically we find predicting stock issuance is a better way to identify future HILP firms.
- **We examine in detail the profile of top PSI firms**.
  - PSI firms are not “safer” by any conventional measure
  - PSI seem emblematic of the notion of “Saliency”
  - Future earnings realizations, default rates, cash conditions all suggest PSI firms are on average overpriced
- **We speculate on why this is an equilibrium outcome**
  - With the hope of stimulating further research

Years ago, on the BBC's "Brains Trust" Prof. Jove said: If you claim that 1=2 you can prove anything.

Another member retorted: "Assume 1=2 and prove that you are the Pope."

Jove replied: That is easy.

- **The Pope and I are 2.**
- **Therefore the Pope and I are 1.**
- **Therefore I am the Pope.**

The Moral of the Story: Begin with the wrong assumption and you can prove anything.

In capital-market research, two seemingly innocuous (yet insidious) assumptions are:

1. "Arbitrage costs are trivial"

2. Therefore, "Price = Value"

Perhaps it is time to re-think these assumptions.

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Sexy or safe: why do predicted stock issuers earn low returns?

Charles M. C. Lee and Ken Li

March 2017

Key Implications

These results are important because:

1. The “risk premium” on these two new factors have *the wrong sign* (the safer firms are earning higher returns)

2. The risk captured probably has more to do with liquidity funding constraints facing financial intermediaries (i.e. deleveraging risk in active asset management), and less to do with exposure to macroeconomic fundamentals.

3. Many of the other anomalies they “explain” (co-move with) are probably also due to mispricing rather than rational compensation for bearing exposure to structural macroeconomic risk.

Table 2: Future INV & ROA by PSI Decile

Panel A: Future firm characteristics by predicted stock issuance decile

Decile	roa_1	roa_2	roa_3	inv_1	inv_2	inv_3	si_1	si_2	si_3
1	0.061	0.050	0.045	0.096	0.086	0.080	-0.047	-0.043	-0.040
2	0.043	0.037	0.033	0.100	0.090	0.081	-0.026	-0.025	-0.024
3	0.034	0.029	0.027	0.104	0.088	0.085	-0.017	-0.017	-0.016
4	0.027	0.020	0.019	0.106	0.096	0.090	-0.010	-0.010	-0.011
5	0.021	0.016	0.012	0.114	0.100	0.093	-0.004	-0.005	-0.005
6	0.014	0.006	0.003	0.123	0.110	0.100	0.002	0.001	-0.001
7	0.005	-0.004	-0.005	0.139	0.121	0.105	0.009	0.006	0.004
8	-0.021	-0.029	-0.031	0.161	0.125	0.117	0.021	0.016	0.013
9	-0.072	-0.084	-0.084	0.192	0.145	0.120	0.044	0.040	0.035
10	-0.314	-0.309	-0.294	0.229	0.176	0.145	0.163	0.141	0.125
Spread	0.375	0.359	0.339	0.133	0.089	0.065	0.209	0.184	0.164
Sig.	***	***	***	***	***	***	***	***	***

PSI is quite good at predicting future investment and profitability

Table 2: Future INV & ROA by HILP

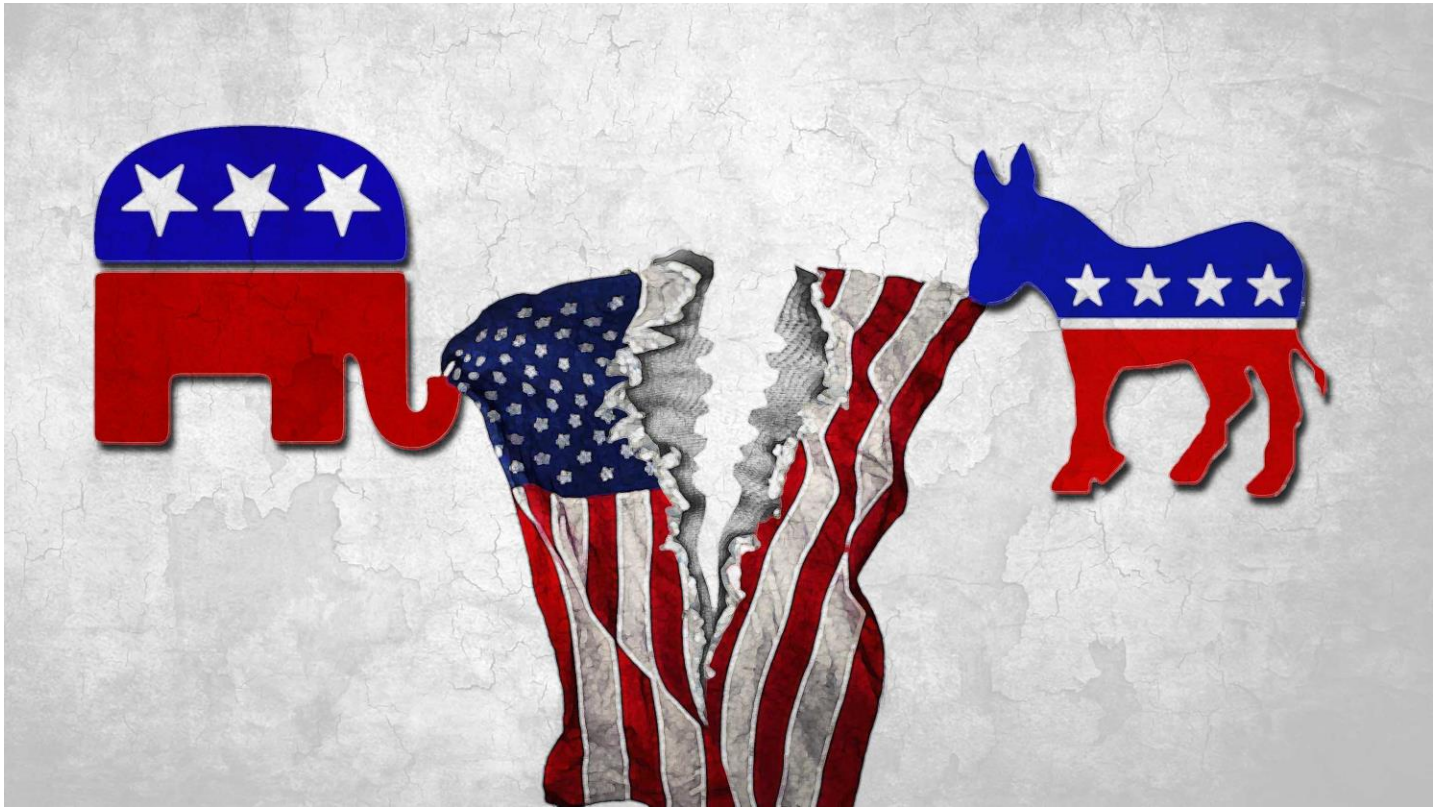
Panel B: Future Firm characteristics by HILP score

Decile	roa_1	roa_2	roa_3	inv_1	inv_2	inv_3
1	0.070	0.058	0.051	0.125	0.117	0.107
2	0.059	0.050	0.045	0.122	0.117	0.103
3	0.051	0.041	0.037	0.137	0.115	0.103
4	0.032	0.023	0.017	0.133	0.109	0.098
5	-0.008	-0.014	-0.016	0.111	0.099	0.092
6	-0.108	-0.098	-0.089	0.102	0.101	0.100
7	-0.035	-0.039	-0.041	0.136	0.113	0.100
8	-0.016	-0.023	-0.026	0.154	0.118	0.104
9	-0.030	-0.037	-0.037	0.170	0.126	0.108
10	-0.192	-0.199	-0.183	0.174	0.130	0.113
Spread	0.263	0.257	0.234	0.049	0.013	0.006
Sig.	***	***	***	***	***	***
PSI Spread - HILP Spread	0.113	0.102	0.105	0.084	0.076	0.059
Sig.	***	***	***	***	***	***

In fact, PSI is better at predicting future investment and profitability than if we sorted firms' using their current investment and profitability

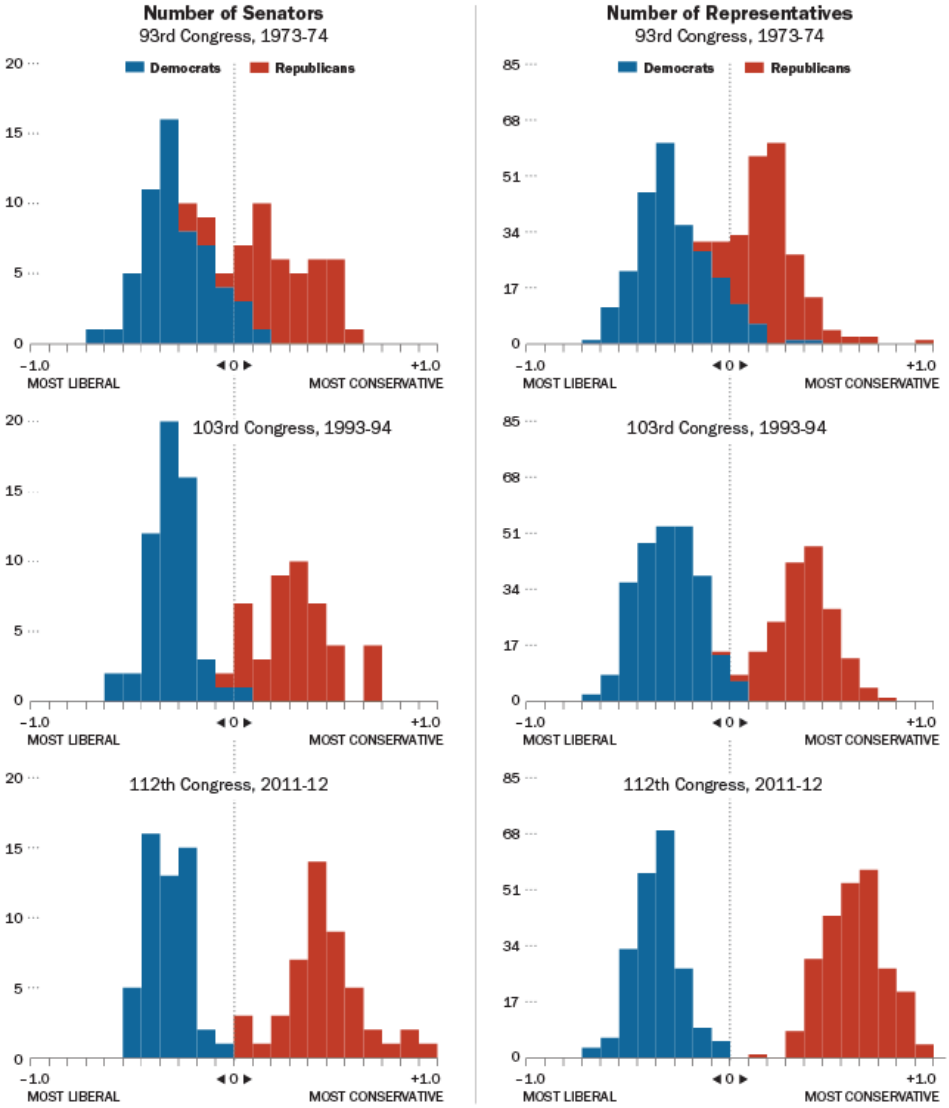
Lasse Pedersen (2015): "Efficiently Inefficient"

Market Efficiency	Investment Implications	
1.Efficient Market Hypothesis: All prices reflect (essentially) all relevant information at all times.	Passive Investing: Investors paying active fees can expect to underperform by the amount of the fee	*But if no one tries to beat the market, who would make it efficient?*
2. Inefficient Markets: Prices are significantly influences by investor irrationality & behavioral biases.	Active Investing: It should be easy to beat the market.	*But markets are competitive & most active managers do not beat the market.*
3. Efficiently Inefficient Markets: Markets are inefficient but to an efficient extent.	Active investing by those with a comparative advantage.	*An equilibrium amount of active (a function of information costs)*



In Congress as Well as Public, the Center Increasingly Cannot Hold

Ideological scores of senators and representatives based on roll-call votes. Negative numbers represent liberal views and positive numbers conservative views



Sources: Royce Carroll, Jeff Lewis, James Lo, Nolan McCarty, Keith Poole and Howard Rosenthal, Voteview.com

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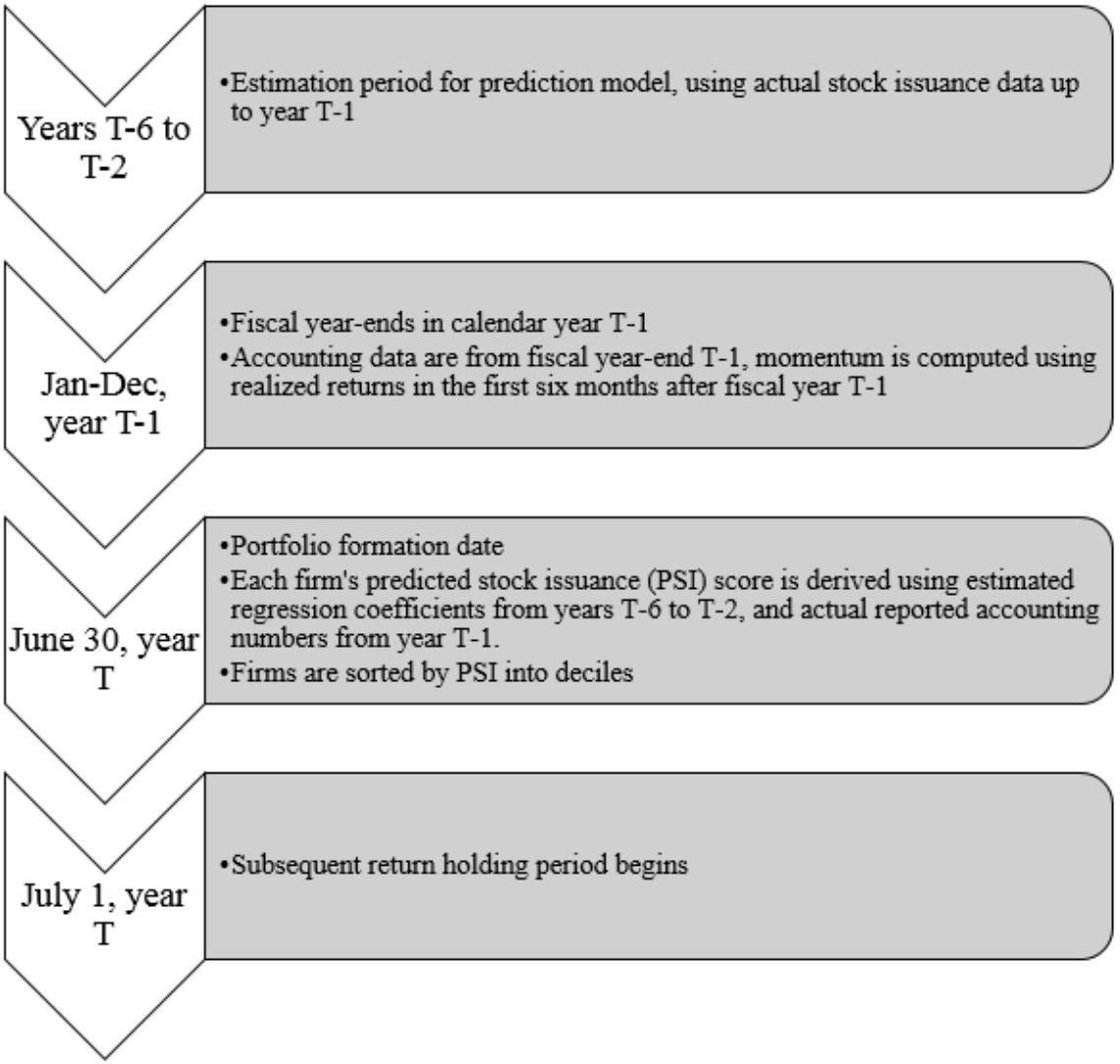
Timeline of Events



Model Estimation
(Years T-6 to T-2)

Portfolio Formation
(June 30, year T)

Holding Period
(Starting July 1, year T)