IPOs as Lotteries:
Skewness Preference and First-Day Returns

Green and Hwang (2012, Management Science)

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Abstract

- Expected Skewness↑ → First-day Return↑
- Investor Sentiment↑ → Skewness Effect↑
- Skewness Effect: Industry Skewness + Market Skewness
- IPO Firm with High Skewness: Long Run Performance↓
- Expected Skewness↑ → First-day Purchase by Individuals↑
- Overall, Skewness Preference Can Explain First-Day IPO Return

We find that initial public offerings (IPOs) with high expected skewness experience significantly greater first-day returns. The skewness effect is stronger during periods of high investor sentiment and is related to differences in skewness across industries as well as to time-series variation in the level of skewness in the market. IPOs with high expected skewness earn more negative abnormal returns in the following one to five years. High expected skewness is also associated with a higher fraction of small-sized trades on the first day of trading, which is consistent with a greater shift in holdings from institutions to individuals. The results suggest that first-day IPO returns are related to a preference for skewness.

Introduction

- Expected Utility Theory
  - Von Neumann and Morgenstern (1944)
- Prospect Theory, Cumulative Prospect Theory
  - Kahneman and Tversky (1979, EMA; 1992, JRU)
- Skewness Overvaluation
  - Brunnermeier and Parker (2005, AER)
  - Brunnermeier, Gollier and Parker (2007, AER)
  - Mitton and Vorkink (2007, RFS)
  - Barberis and Huang (2008, AER)
  - Boyer, Mitton and Vorkink (2010, RFS): Empirical Evidence

Introduction (Cont'd)

- Rational Institutions
  - Grinblatt and Keloharju (2001, JF)
  - Battalio and Mendenhall (2005, JFE)
- Gambling Individuals
  - Kumar (2009, JF)

Introduction (Cont'd)

- Initial IPO Underpricing
  - Classic: Information Asymmetry
    - Beatty and Ritter (1986, JFE)
    - Rock (1986, JFE)
  - Modern: Investor Over-Optimism
    - Purnanandam and Swaminathan (2004, RFS): IPO Misvaluation
    - Derrien (2005, JF)
    - Cornelli, Goldreich and Ljungqvist (2006, JF)
    - Ljungqvist, Nanda and Singh (2006, JB)
    - Dorn (2009, JFQA): German Evidence
  - Others
    - Tinic (1988, JF): Reputation
    - Lowry and Shu (2002, JFE): Litigation Risk

Data

- IPOs
  - Thompson Financial Securities Data, New Issues Database
  - Exclude Firms Not Covered by…
    - CRSP within One Day of the IPO
    - Field–Ritter Dataset of IPO Founding Dates
    - FF30 Industry 30, i.e. No Industry Information
- Accounting, Financial Market and Trading
  - Compustat, CRSP, TAQ Database
- University of Michigan Consumer Confidence Index
  - Federal Reserve Bank of St. Louis
- Coverage
  - 7,975 IPOs
  - 1975–2008

Methodology

- Expected Skewness Measure (Ex-Ante Skewness)

$$Skew_{i,t} = \frac{(P_{99} - P_{50}) - (P_{50} - P_1)}{(P_{99} - P_1)}$$

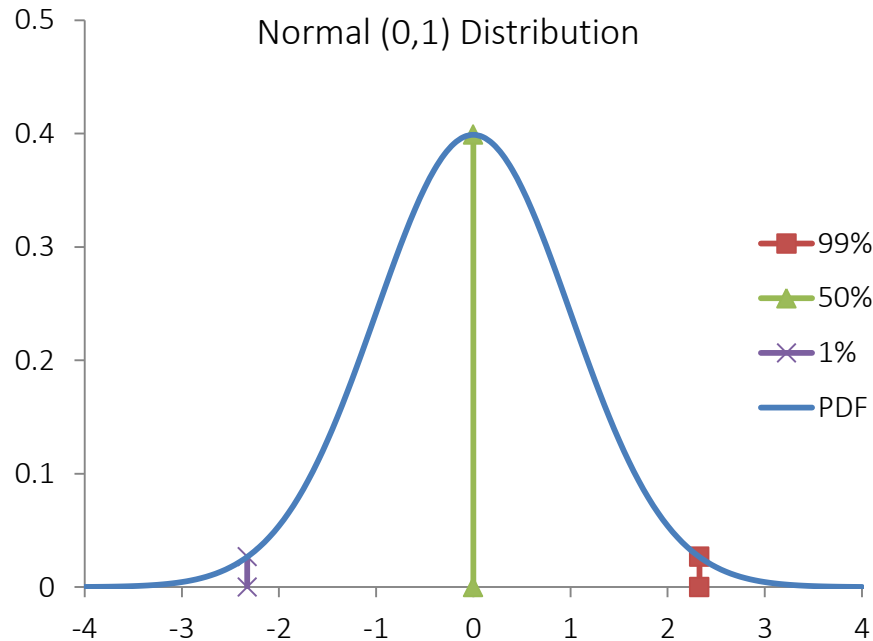 - Zhang (2006)

- Idiosyncratic Skewness (Ex-Post Skewness)

$$is_{i,t} = \frac{1}{N(t)} \frac{\sum_{d \in S(t)} \varepsilon_{i,d}^3}{iv_{i,t}^3}$$

$$iv_{i,t} = \left(\frac{1}{N(t)} \sum_{d \in S(t)} \varepsilon_{i,d}^2 \right)^{1/2}$$

  - Fama and French (1993, JFE)
  - Boyer, Mitton and Vorkink (2010, RFS)

- Rank IPOs on the Basis of *Skew* and Form 3 Portfolios

Expected Skewness Measure (Example)

Normal (0,1) Distribution
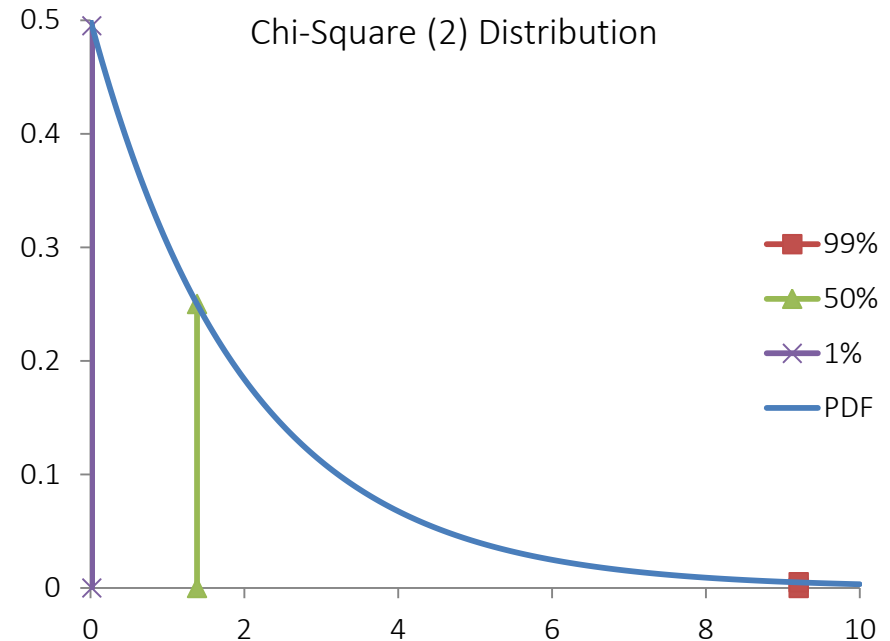
Chi-Square (2) Distribution

F(99%)=2.33
F(50%)=0
F(1%)=−2.33

$$Skew = \frac{(2.33 - 0) - (0 - 2.33)}{(2.33 - (-2.33))} = 0$$

F(99%)=9.21
F(50%)=1.39
F(1%)=0.02

$$Skew = \frac{(9.21 - 1.39) - (1.39 - 0.02)}{(9.21 - 0.02)} = 0.70$$

Table 1: Expected Skewness Works Well

Table 1   Predictive Power of Estimator for Expected Skewness

	Postranking skewness			
	1 month	3 months	6 months	12 months
Panel A: Three-factor model				
Low	0.253	0.329	0.342	0.373
	(15.14)	(16.44)	(15.70)	(15.73)
Medium	0.311	0.398	0.435	0.433
	(16.35)	(17.10)	(16.67)	(17.01)
High	0.347	0.432	0.451	0.502
	(14.97)	(16.17)	(14.68)	(13.85)
Δ(High–Low)	0.094	0.102	0.109	0.129
	(3.30)	(3.08)	(2.88)	(3.04)
Panel B: Market model				
Low	0.258	0.324	0.335	0.365
	(14.27)	(15.56)	(15.01)	(15.17)
Medium	0.323	0.388	0.417	0.410
	(15.44)	(16.09)	(15.88)	(16.21)
High	0.375	0.434	0.434	0.486
	(15.33)	(15.94)	(14.13)	(13.38)
Δ(High–Low)	0.116	0.110	0.099	0.121
	(3.82)	(3.21)	(2.60)	(2.84)

Table 3: High-Skews Earn More in the 1st Day

Table 3   First-Day Returns on IPOs and Expected Skewness

	Mean initial return (%)	Median initial return (%)	Observations
Panel A: Pooled			
Low	11.44	4.17	3,120
Medium	18.55	7.50	2,868
High	25.78	9.09	1,987
Δ(High–Low)	14.34	4.92	
	(11.15)	(8.98)	
Panel B: Calendar time			
Low	10.86	5.15	32
Medium	15.49	9.01	30
High	16.88	9.81	30
Δ(High–Low)	6.00	4.49	
	(2.84)	(3.03)	

Figure 1: This Relation is Almost Monotonic

Figure 1   Expected Skewness and Average Initial Returns Across Subperiods
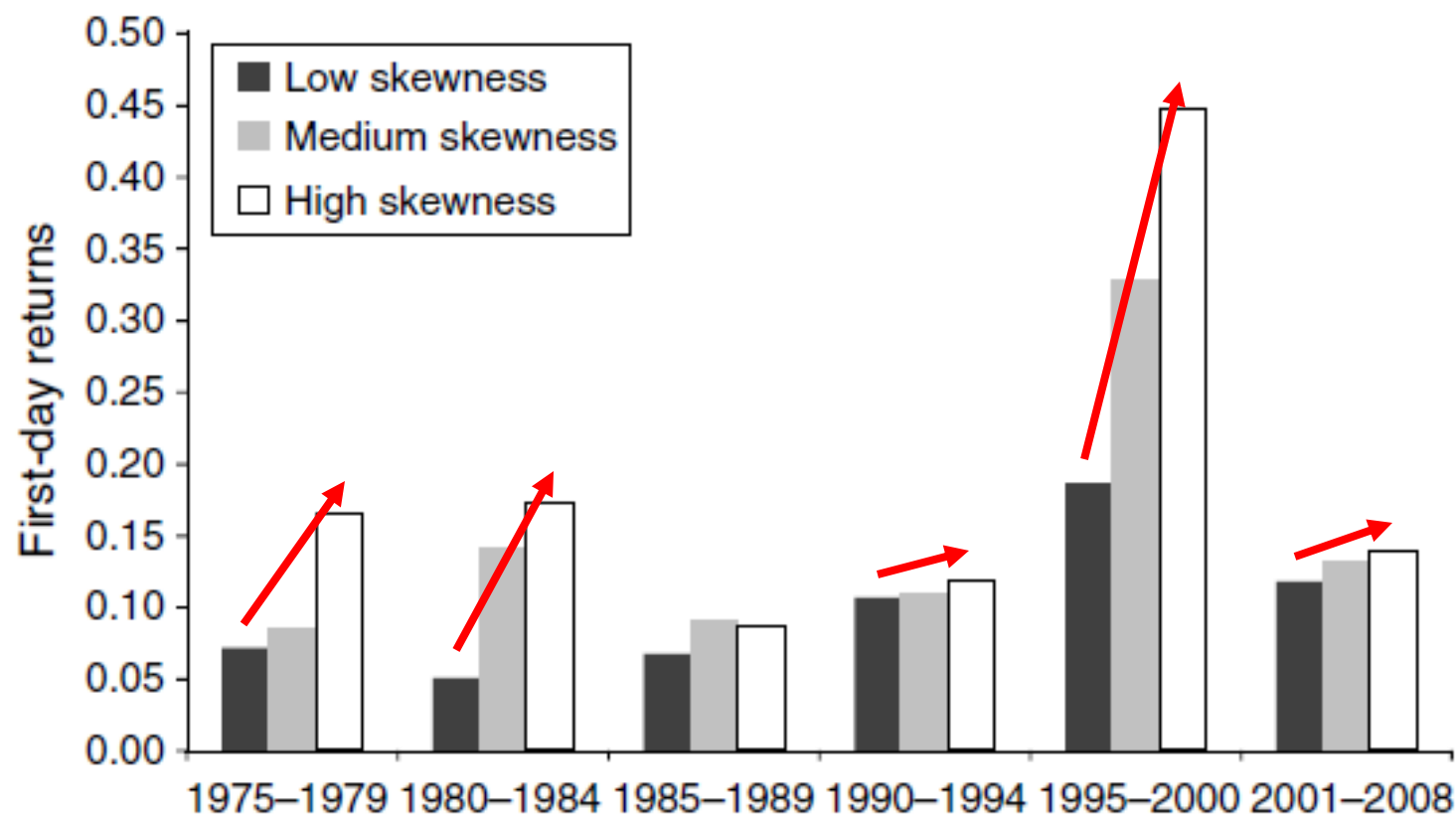
Table 4: Market Skewness Also Matters

Table 4   First-Day Returns on IPOs and Expected Skewness—Market vs. Industry

	Skew (%)				Δ (%)
	All	Low	Medium	High	
MarketSkew					
Low	13.81	11.69	11.43	18.69	7.00 (4.85)
Medium	14.83	10.65	16.94	17.72	7.07 (4.70)
High	28.21	21.18	29.15	37.13	15.94 (5.03)
Δ(High–Low)	14.40 (10.56)	9.48 (6.18)	17.71 (6.95)	18.44 (5.89)	

Table 5: Regress 1st-Day Return on Skewness

Table 5 First-Day Returns on IPOs and Expected Skewness: Regression Approach

	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Firm characteristics								
Skewness	0.327	(10.22)	0.110	(4.44)			0.063	(2.51)
Right Skewness					0.153	(4.05)		
Left Skewness					−0.120	(−3.35)		
Age			−0.001	(−5.84)	−0.001	(−5.84)	−0.001	(−5.08)
Coskewness			0.000	(0.36)	0.000	(0.38)	0.000	(0.26)
Internet			0.278	(6.96)	0.277	(6.94)	0.268	(6.82)
NASDAQ			0.073	(4.58)	0.072	(4.55)	0.068	(4.17)
NYSE			0.028	(1.56)	0.028	(1.59)	0.035	(1.97)
Deal characteristics								
Ln(*Proceeds*)			0.015	(3.11)	0.015	(3.12)	0.013	(2.85)
Price Adjustment			0.375	(7.45)	0.375	(7.46)	0.369	(7.48)
Share Overhang			0.088	(10.66)	0.088	(10.44)	0.085	(10.42)
Pure Primary			0.004	(0.74)	0.004	(0.67)	0.016	(2.66)
Venture-Backed Deal			0.007	(0.86)	0.006	(0.69)	0.010	(1.16)
Top-Tier Underwriter			−0.008	(−0.95)	−0.008	(−1.00)	−0.005	(−0.55)
Market characteristics								
Retail Investor Optimism			0.002	(6.24)	0.002	(6.34)	0.001	(4.05)
Market Return			1.326	(9.85)	1.333	(9.96)	1.018	(7.55)
IPO Volatility			0.327	(5.09)	0.304	(4.84)	0.241	(3.98)
Y(1990–1998)			0.015	(2.19)	0.014	(1.91)	0.017	(2.09)
Y(1999–2000)			0.024	(0.49)	0.025	(0.51)	0.043	(0.86)
Y(2001–2008)			−0.023	(−1.94)	−0.021	(−1.74)	0.006	(0.31)
Industry characteristics								
Industry Return							0.497	(5.06)
Industry Momentum							0.161	(6.62)
Industry Volatility							0.313	(1.38)
Industry Turnover							0.013	(0.81)
Industry Fixed Effects		No		No		No		Yes
Adj. *R*-squared		0.013		0.310		0.311		0.330
Observations		7,975		7,603		7,603		7,603

Table 6: Individuals Love High-Skews

Table 6   Trades in IPOs and Expected Skewness

	Coef.	*t*-stat.	Coef.	*t*-stat.
Skewness	0.056	(5.29)	0.049	(4.92)
Age			−0.000	(−2.33)
Coskewness			−0.000	(−0.21)
Internet			0.067	(12.31)
NASDAQ			−0.005	(−0.39)
NYSE			−0.006	(−0.46)
Ln(Proceeds)			−0.026	(−10.72)
Retail Investor Optimism			0.002	(12.31)
Market Return			0.022	(0.51)
Adj. *R*-squared	0.006		0.161	
Observations	3,320		3,211	

Table 7: High-Skews are Poor in the Long Run

Table 7   Expected Skewness and Long-Run Performance of IPOs

Skew	First year (%)	Third year (%)	Fifth year (%)
	Panel A: Cumulative percentage returns		
Low			
IPO firms	10.89	36.16	60.98
Matching firms	9.34	37.36	65.86
Difference	1.55	−1.20	−4.88
	(0.85)	(−0.26)	(−0.41)
Observations	2,792	2,692	2,101
Medium			
IPO firms	6.95	24.88	54.95
Matching firms	6.57	28.99	64.71
Difference	0.39	−4.11	−9.76
	(0.20)	(−0.87)	(−1.09)
Observations	2,686	2,608	2,027
High			
IPO firms	−0.71	5.46	36.11
Matching firms	9.31	23.00	72.14
Difference	−10.02	−17.54	−36.03
	(−4.14)	(−4.20)	(−3.78)
Observations	1,907	1,882	1,434
$\Delta(Difference_{High} - Difference_{Low})$	−11.57	−16.35	−31.15
	(−3.82)	(−2.64)	(−2.05)

Table 7 (Cont'd) Bad Results in the Long Run

Table 7   Expected Skewness and Long-Run Performance of IPOs

Skew	First year (%)	Third year (%)	Fifth year (%)
Panel B: Calendar time—Monthly portfolio returns			
Low			
IPO firms	0.78	1.17	1.19
Matching firms	1.25	1.30	1.26
Difference	−0.47	−0.13	−0.07
	(−1.68)	(−0.71)	(−0.44)
Medium			
IPO firms	1.14	0.87	0.87
Matching firms	1.25	1.14	1.14
Difference	−0.11	−0.27	−0.27
	(−0.33)	(−1.26)	(−1.42)
High			
IPO firms	0.59	0.82	0.93
Matching firms	1.30	1.28	1.27
Difference	−0.71	−0.46	−0.34
	(−1.58)	(−2.31)	(−2.08)
$\Delta(Difference_{High} - Difference_{Low})$	−0.24	−0.33	−0.27
	(−0.48)	(−1.45)	(−1.31)

High-Skew IPOs as Lotteries

Buying Rush in the First Day
→ Individuals Prefer (and Buy) High-Skews
→ Strong Preference during High Investor Sentiment Periods
→ High 1st Day Returns are the Results

Losing Ticket after Purchase
→ Only High-Skews Tend to Experience Long-run Underperformance
→ Alleviation of the Initial Overpricing

Conclusion

- Theoretically…
  - Skewness Preference↑ → Price↑
  - Individuals Tend to Prefer Skewness, but Institutions Do not
  - Primary Market Does Not Reflect This
- Empirically…
  - Expected (Industry/Market) Skewness↑ → First-Day IPO Return↑
  - Investor Sentiment↑ → Skewness Effect↑
  - Expected Skewness↑ → Shift in Holdings from Institutions to Individuals↑
  - Expected Skewness↑ → 1, 3, 5-Year IPO Return↓
- "Skewness Preference is an Important Incremental Source of First-Day IPO Returns."

Q&A Session

Thanks for Listening