The New Issues Puzzle

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Contents

1 IPO Sample and Issuer Characteristics

1.1 Annual Sample Distribution

- Sample consists of 6,193 Nasdaq IPOs, or 95% of all IPOs over the 1972-1998 period
- There were also about 450 IPOs on the NYSE/Amex. Adding these does not alter conclusions

1.2 IPO Firms are of Average Size and have Low B/M

1.3 IPO Firms have High Liquidity and Low Leverage

Figure 1
Annual Distribution of 6,139 Nasdaq IPOs with offer dates between 1972–1998.

The column heights represent the number of Nasdaq IPOs in the sample for a given year.

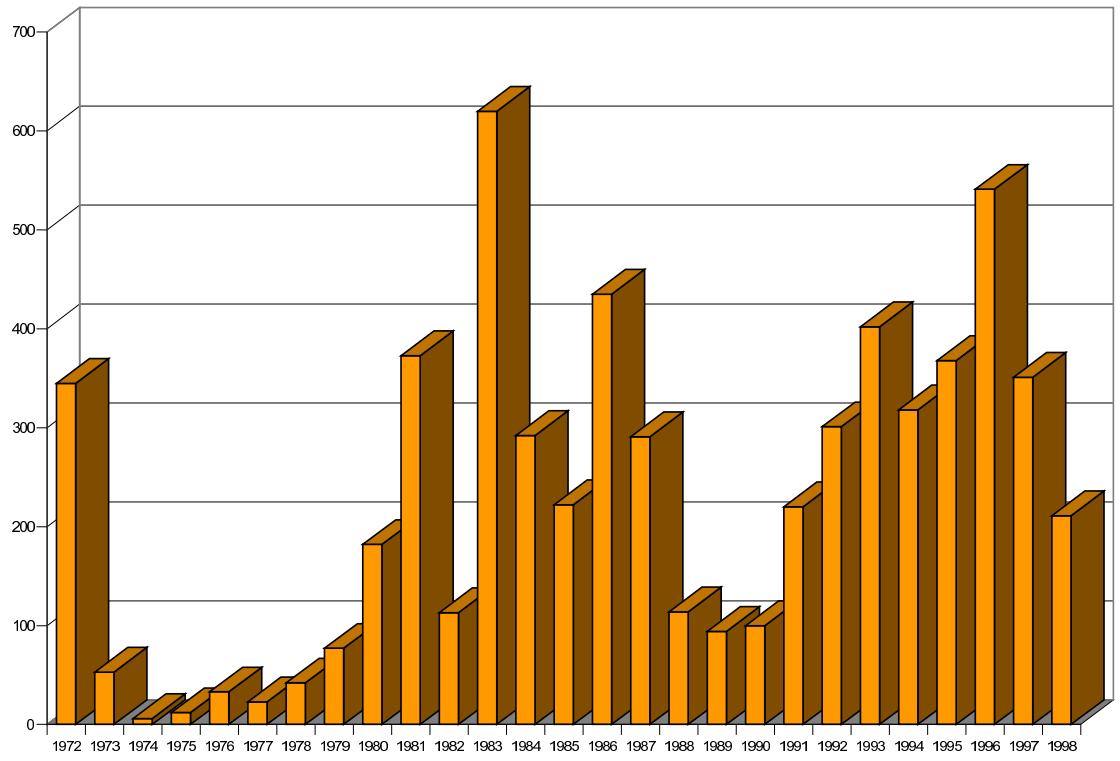
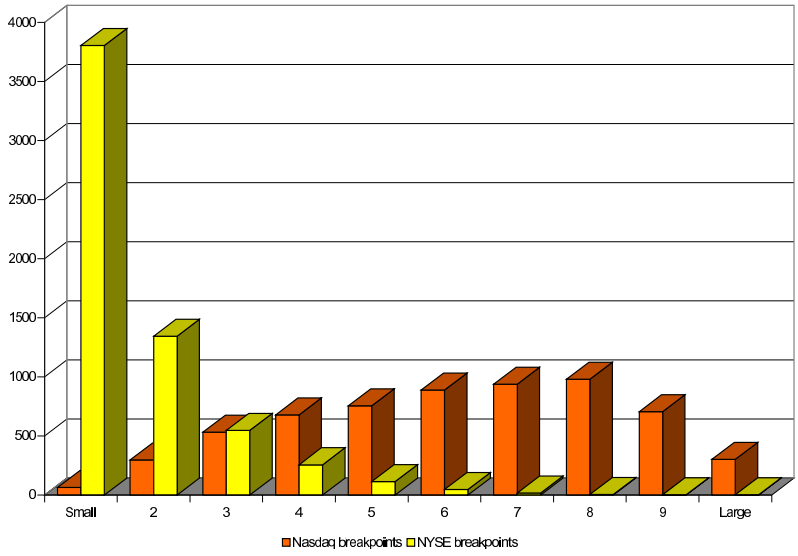


Figure 2
IPO size and book-to-market ratio distributions, for the total sample of 6,139 Nasdaq IPOs, 1973-2002.

In Panel A, each IPO are placed in a size decile using either NYSE size breakpoints or Nasdaq size breakpoints. In panel B, each IPO are placed in a book-to-market ratio decile using either NYSE book-to-market breakpoints or Nasdaq book-to-market breakpoints. The column heights represent the number of IPOs in each decile.

(A) IPO size distribution



(B) IPO book-to-market ratio distribution

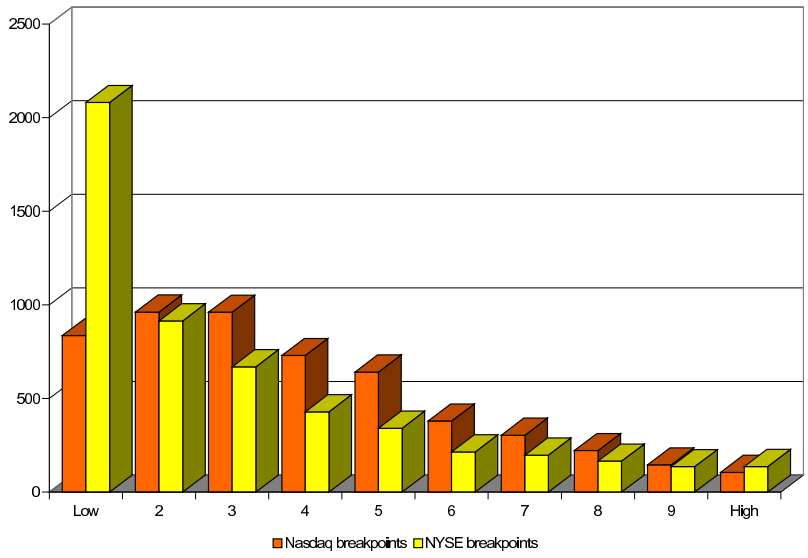


Table 1
Average annual leverage ratios and turnover for firms going public between 1972 and 1998 and their non-issuing control firms.

In Panel A, turnover is volume divided by number of shares outstanding. The reported turnovers are average monthly turnover for each year zero to five in the holding period. In Panel B, leverage is computed using long-term debt, total debt (long-term debt plus debt in current liabilities), and total assets at the end of the fiscal year (as reported by COMPUSTAT). Market values are measured at the end of the calendar year. Observations with negative book equity value and observations with a long-term debt to market value ratio that exceeds 10,000 are excluded. All issuers and matching firms are listed on Nasdaq.

(A) Turnover

	Issuers and size matched firms				Issuers and size-book-to-market matched firms			
Year	N	Issuer	Match	p-diff	N	Issuer	Match	p-diff
0	5195	0.126	0.074	0.000	4501	0.128	0.113	0.008
1	5536	0.111	0.074	0.000	4792	0.117	0.111	0.039
2	5314	0.120	0.077	0.000	4668	0.127	0.111	0.000
3	4601	0.120	0.079	0.000	4196	0.129	0.110	0.000
4	3823	0.119	0.077	0.000	3679	0.129	0.112	0.000
5	3165	0.106	0.071	0.000	3180	0.119	0.105	0.000

(B) Leverage

		Long-term debt divided by total assets			Long-term debt divided by market value of equity			Total debt divided by total assets		
Year	N	Issuer	Match	p-diff	Issuer	Match	p-diff	Issuer	Match	p-diff
Issuers and size matched firms										
0	4005	0.101	0.137	0.000	0.155	0.383	0.000	0.151	0.191	0.000
1	3879	0.124	0.143	0.000	0.289	0.467	0.000	0.183	0.200	0.000
2	3516	0.139	0.144	0.259	0.400	0.463	0.029	0.198	0.200	0.633
3	3079	0.147	0.145	0.710	0.443	0.525	0.014	0.207	0.199	0.096
4	2491	0.147	0.140	0.100	0.609	0.481	0.045	0.208	0.197	0.042
5	2082	0.150	0.145	0.252	0.685	0.532	0.033	0.209	0.203	0.296
Issuers and size/book-to-market matched firms										
0	4661	0.103	0.133	0.000	0.164	0.244	0.000	0.155	0.189	0.000
1	4408	0.125	0.139	0.000	0.293	0.315	0.224	0.185	0.196	0.005
2	3910	0.138	0.140	0.662	0.386	0.357	0.279	0.197	0.195	0.705
3	3362	0.145	0.146	0.881	0.443	0.402	0.143	0.207	0.201	0.269
4	2725	0.145	0.146	0.837	0.550	0.406	0.000	0.206	0.204	0.652
5	2274	0.151	0.149	0.624	0.621	0.480	0.017	0.211	0.210	0.828

2 The Behavior of Total Returns

2.1 Total, Long-Run IPO Returns are "Low"

- Invest $1 in the first Nasdaq IPO in 1972 and hold this stock for five years or until delisting (whichever comes first)
- Start the investment in the month following the month of the IPO
- Split (equal-weight) the dollar investment to hold every new IPO that comes along until 1998 (again with five-year holding periods)

2.2 Low IPO Returns are <u>not</u> the Result of Delistings

2.3 IPO Stocks as "Long-Shots"

Figure 3
Compounded returns on equally weighted portfolios, 1973–2002.

The graphs depicts how the value of a $1 investment evolves over the sample period January 1973 to December 2002. The portfolios are the EW CRSP Nasdaq index, an EW portfolio of Nasdaq-IPOs, an EW portfolio of size-matched firms, an EW portfolio of size-book-to-market ratio matched firms, and 30-day Treasury bills. The total sample is 6,139 IPOs, 1973–2002.

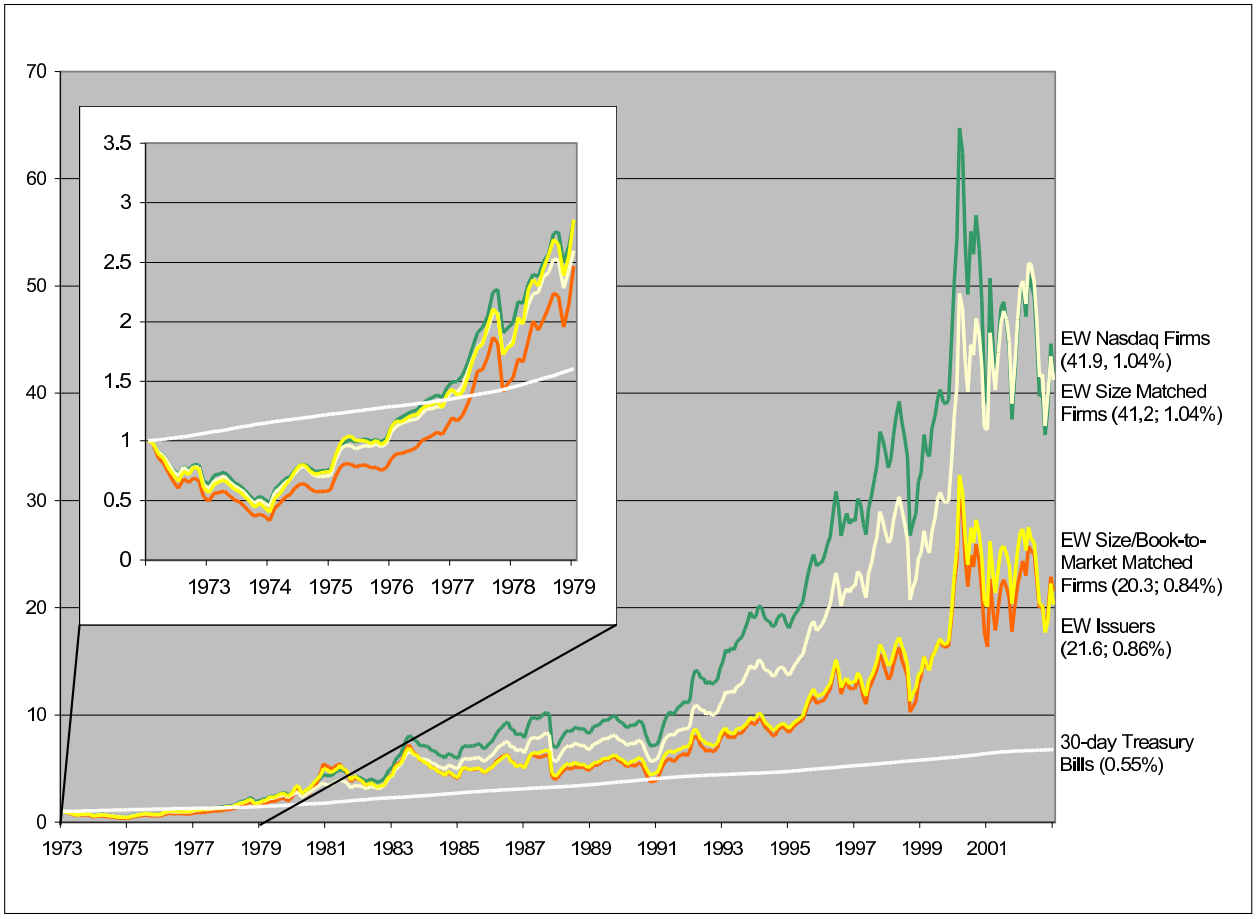
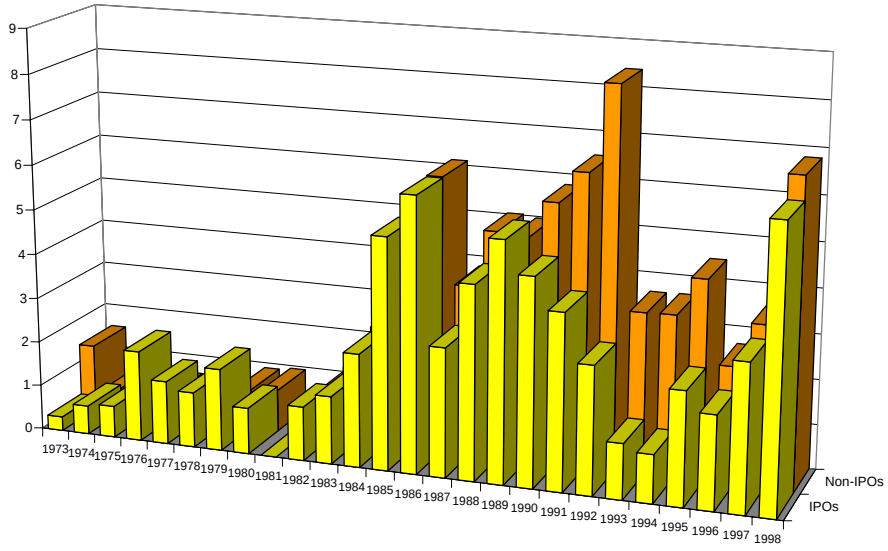


Figure 4
Delistings due to liquidation, mergers or takeovers.

Panel A covers delistings due to liquidations. Panel B covers number of delistings due to merger, takeover, exchange offers, or other events where common shareholders are bought out. In both panels, front columns are delistings by recent IPO firms (IPO less than five years before delisting date) divided by number of recent IPO firms. Back columns are delistings by Non-IPO firms (IPO more than five years ago) divided by number of non-IPO firms. Total sample of 6,139 IPOs from 1972-1998.

(A) Delistings due to liquidation



(B) Delistings due to merger or takeover

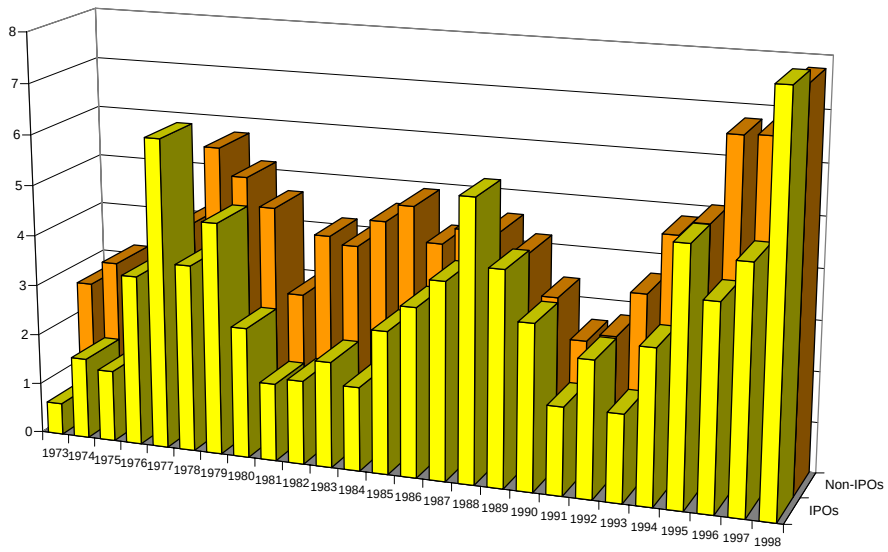
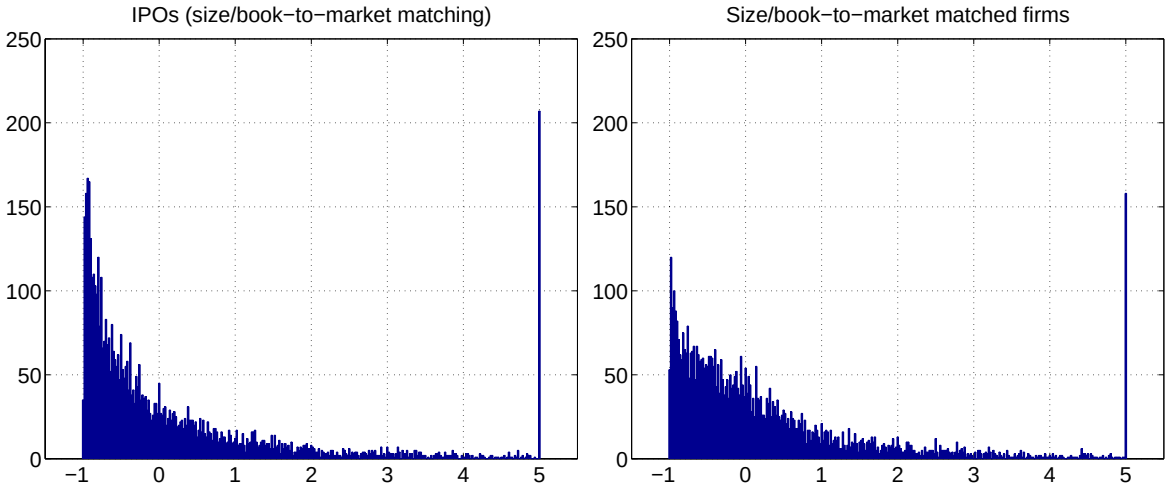


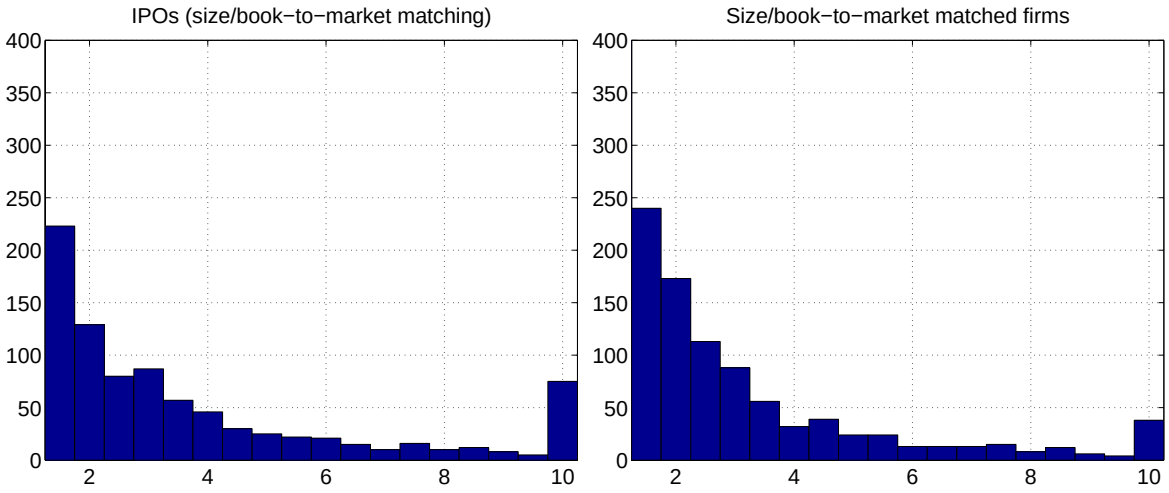
Figure 5
Histogram of five-year holding period returns between −100% and 1000% for issuers and size/book-to-market matched control firms.

Each bar in the histogram represent a 2 percentage point interval, and the height of the bar shows how many firms had a five-year holding period return within this 2 percentage point interval.

(A) Histogram of five-year holding period returns between −100% and 500%



(B) Histogram of five-year holding period returns between 100% and 1000%



3 The Behavior of Abnormal Returns

3.1 Abnormal Returns, Measured as Buy-and-Hold Returns in Event Time and using the Matched-Firm Technique, are Negative

- Two studies with the largest samples of security issues in the literature:
  - Eckbo, Masulis, and Norli (2000): Long-run study of 4,900+ SEOs and 2,000+ corporate debt offerings from 1964–1995
  - Eckbo and Norli (2005): Long-run study of 6,000+ IPOs from 1992-1998
- Tables from these two studies showing $\overline{\text{BHR}}$ (with weights ω_i that are either equal-weights or value-weights) follow

3.2 Abnormal Returns, Measured using Calendar Time Estimation and Risk Factor Models, are Indistinguishable from Zero

Table 2
Extracted from Eckbo, Masulis, and Norli (2000): Five-year buy-and-hold stock percent returns ($\overline{\text{BHR}}$) to seasoned equity issuers and their matched control firms, classified by exchange listing, industry type (industrial/utility), type of matching procedure (size/size-and-book-to-market), and portfolio weights (equal-/value-weighted) over the 1964–1995 period.

Buy-and-hold percent returns are defined as

$$\overline{\text{BHR}} \equiv \sum_{i=1}^{N} \omega_i \left[\prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right] \times 100.$$

When equal-weighting (EW), $\omega_i \equiv \frac{1}{N}$, and when value-weighting (VW), $\omega_i = MV_i/MV$, where MV_i is the firms's common stock market value (in 1995 dollars) of the issuer in the month prior to the start of the holding period and $MV = \sum_i MV_i$. The p-values in the column marked $p(t)$ are p-values of the t-statistic using a two-sided test of no difference in average five-year buy-and-hold returns for issuer and matched firms. In panel B matches are drawn from the NYSE/Amex only, while in panel C matches are required to be listed on Nasdaq.The abnormal buy-and-hold returns shown in the columns marked "Difference" represent the difference between the average BHR in the "Issuer" and "Match" columns. The columns marked "Num obs." contain number of issues.

		Size matching					Size and book-to-market matching				
Industry	Weighting	Num obs.	Issuer	Match	Difference	$p(t)$	Num obs.	Issuer	Match	Difference	$p(t)$
A. All seasoned stock offerings (NYSE/Amex/Nasdaq)											
Ind	EW	3851	44.2	71.1	−26.9	0.000	3315	44.3	67.5	−23.2	0.000
Ind	VW	3851	50.6	71.8	−21.1	0.006	3315	51.6	62.2	−10.6	0.161
Utl	EW	1009	35.5	41.3	−5.8	0.110	880	36.6	55.7	−19.0	0.000
Utl	VW	1009	27.7	33.9	−6.2	0.105	880	27.9	46.5	−18.6	0.002
B. Seasoned stock offerings by NYSE/Amex listed firms											
Ind	EW	1704	53.0	73.7	−20.7	0.000	1485	52.7	70.8	−18.1	0.001
Ind	VW	1704	52.3	71.3	−19.0	0.033	1485	53.2	59.6	−6.4	0.468
Utl	EW	976	34.6	43.0	−8.4	0.021	847	35.6	51.3	−15.7	0.000
Utl	VW	976	27.3	35.3	−8.0	0.039	847	27.4	45.8	−18.4	0.002
C. Seasoned stock offerings by Nasdaq listed firms											
Ind	EW	2147	38.7	69.3	−30.6	0.000	1829	39.3	65.8	−26.6	0.000
Ind	VW	2147	47.3	72.4	−25.1	0.002	1829	48.7	66.8	−18.2	0.058

Table 3
Extracted from Eckbo, Masulis, and Norli (2000): Five-year buy-and-hold stock returns (%) for all firms undertaking seasoned bond offerings with NYSE- or Amex-listed stock and their control sample matched on exchange listing, size, and (optionally) book-to-market ratios for the 1964–1995 period. The sample is classified by portfolio weights, industry type, and debt category.

Matched firms are required to have stocks listed on NYSE/Amex, and are chosen using size matching alone or size and book-to-market matching. The size-matching is done using the equity market value of the issuer. Book-to-market matching involves first selecting all companies that have an equity market value within 30% of that of the issuer and then choosing the company with the closest book-to-market value. Numbers in the columns marked "Issuer" and "Match" are computed using

$$\overline{\mathrm{BHR}} \equiv \sum_{i=1}^{N} \omega_i \left[\prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right] \times 100,$$

where the weights are $\omega_i \equiv 1/N$ for equal-weighted averages and $\omega_i = MV_i/MV$ for value-weighted averages , where MV_i is the market value (in 1995 dollars) of the issuer in the month prior to the start of the holding period and $MV = \sum_i MV_i$. The p-values in the column marked $p(t)$ are p-values of the t-statistic using a two-sided test of no difference in average five-year buy-and-hold returns for issuer and matched firms.

		Size matching					Size and book-to-market matching				
Industry	Weighting	Num obs.	Issuer	Match	Difference	p(t)	Num obs.	Issuer	Match	Difference	p(t)
A. Straight debt offerings by NYSE/Amex-listed firms											
Ind	EW	1125	52.1	55.1	-3.0	0.556	981	51.7	62.9	-11.2	0.064
Ind	VW	1125	29.2	29.8	-0.6	0.902	981	31.1	32.3	-1.1	0.832
Utl	EW	404	25.3	30.7	-5.5	0.238	348	24.5	35.0	-10.4	0.022
Utl	VW	404	15.0	18.9	-3.9	0.206	348	16.1	26.3	-10.2	0.007
B. Convertible bond offerings by NYSE/Amex-listed firms											
Ind	EW	542	49.3	78.8	-29.5	0.000	459	51.7	67.7	-16.1	0.050
Ind	VW	542	45.0	72.9	-28.0	0.012	459	45.2	73.4	-28.2	0.058

Table 4
Extracted from Eckbo and Norli (2005): Five-year buy-and-hold stock percent returns ($\overline{\text{BHR}}$) for a total of 6,139 firms going public between 1972 and 1998 and their matched control firms

Buy-and-hold percent returns are defined as:

$$\overline{\text{BHR}} \equiv \sum_{i=1}^{N} \omega_i \left[\prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right] \times 100.$$

When equal-weighting (EW), $\omega_i \equiv 1/N$, and when value-weighting (VW), $\omega_i = MV_i/MV$, where MV_i is the issuer's common stock market value (in 1999 dollars) at the start of the holding period and $MV = \sum_i MV_i$. The abnormal buy-and-hold returns shown in the column marked "Diff" represent the difference between the $\overline{\text{BHR}}$ in the "Issuer" and "Match" columns. The rows marked "N" contain number of issues. The p-values for equal-weighted abnormal returns are p-values of the t-statistic using a two-sided test of no difference in average five-year buy-and-hold returns for issuer and matching firms. The p-values for the value-weighted abnormal returns are computed using $U \equiv \omega' x/(\sigma\sqrt{\omega'\omega})$, where ω is a vector of value weights and x is the corresponding vector of differences in buy-and-hold returns for issuer and match. Assuming that x is distributed normal $N(\mu, \sigma^2)$ and that σ^2 can be consistently estimated using $\sum_i \omega_i (x_i - \bar{x})^2$, where $\bar{x} = \sum_i \omega_i x_i$, U is distributed $N(0, 1)$. All issuers and matching firms are listed on Nasdaq.

	Size matching					Size/book-to-market matching				
	N	Issuer	Match	Diff	$p(t)$	N	Issuer	Match	Diff	$p(t)$
(A) Total sample										
EW	6139	36.7	65.4	−28.8	0.000					
VW	6139	53.7	72.8	−19.1	0.028					
(B) Require sample firms to have book values on Compustat										
Holding period starts the month after the IPO date (looking ahead for the first book value on Compustat)										
EW	5365	39.8	68.7	−28.9	0.000	5365	39.8	42.2	−2.4	0.692
VW	5365	57.9	76.8	−18.8	0.054	5365	57.9	57.6	0.3	0.971
Holding period starts the month after first post-IPO book value on Compustat										
EW	5289	40.9	70.3	−29.3	0.000	5289	40.9	62.0	−21.0	0.002
VW	5289	105.4	76.6	28.9	0.187	5289	105.4	90.9	14.5	0.537

Table 5
Jensen's alphas and factor loadings for characteristic based factors for stock portfolios of a total of 6,139 firms going public (IPOs) on Nasdaq and their non-issuing control firms, 1973–2002.

The model is:

$$r_{pt} = \alpha_p + \beta_1 \mathrm{RM}_t + \beta_2 \mathrm{SMB}_t + \beta_3 \mathrm{HML}_t + \beta_4 \mathrm{UMD}_t + \beta_5 \mathrm{Liquidity}_t + e_t$$

where r_{pt} is either a portfolio excess return or a return on a zero investment portfolio that is long issuers and short in matching firms. Portfolios are first formed in January 1973 and held until December 2002. RM is the excess return on a value weighted market index, SMB and HML are the Fama and French (1993) size and book-to-market factors, UMD is a momentum factor and is constructed as the return difference between the one-third highest and one-third lowest CRSP performers over the past 12 months. The SMB, HML, and UMD factors are constructed by Ken French and are downloaded from his web-page. The liquidity factor LMH is constructed using an algorithm similar to the one used by Fama and French (1993) when constructing the SMB and HML factors. To construct LMH, we start in 1972 and form two portfolios based on a ranking of the end-of-year market value of equity for all NYSE/AMEX stocks and three portfolios formed using NYSE/AMEX stocks ranked on turnover. Next, six portfolios are constructed from the intersection of the two market value and the three turnover portfolios. Monthly value-weighted returns on these six portfolios are calculated starting in January 1973. Portfolios are reformed in January every year using firm rankings from December the previous year. The return on the LMH portfolio is the difference between the equal-weighted average return on the two portfolios with low turnover and the equal-weighted average return on the two portfolios with high turnover. The PS factor is constructed as in Pastor and Stambaugh (2003) using order-flow related return reversals. In the panel headings, T is the number of months in the time series regression, N is the average number of firms in the portfolio, and I is the number of issues used to construct the portfolio. The coefficients are estimated using OLS. Standard errors are computed using the heteroskedasticity consistent estimator of White (1980). The numbers in parentheses are p-values.

		Factor betas (T=360, N=823)					
Portfolio	$\hat{\alpha}$	RM	SMB	HML	UMD	Liquidity	A-Rsq
(A) Issuers and size matched control firms (I=6,139)							
Liquidity measured using turnover (LMH)							
Issuer	0.35 (0.138)	0.93 (0.000)	1.06 (0.000)	−0.11 (0.182)	−0.13 (0.133)	−0.39 (0.016)	0.850
Match	0.26 (0.069)	0.86 (0.000)	0.95 (0.000)	0.14 (0.004)	−0.13 (0.007)	−0.09 (0.325)	0.907
Issuer−match	0.09 (0.501)	0.07 (0.103)	0.11 (0.048)	−0.26 (0.000)	−0.00 (0.967)	−0.29 (0.001)	0.435
Liquidity measured as delayed price response to order flow (Pastor and Stambaugh, 2003, PS *)*							
Issuer	0.25 (0.261)	1.08 (0.000)	1.19 (0.000)	−0.16 (0.052)	−0.15 (0.103)	−0.08 (0.137)	0.846
Match	0.24 (0.068)	0.90 (0.000)	0.99 (0.000)	0.13 (0.007)	−0.14 (0.009)	−0.02 (0.582)	0.906
Issuer−match	0.01 (0.959)	0.19 (0.000)	0.21 (0.000)	−0.29 (0.000)	−0.02 (0.734)	−0.06 (0.033)	0.416
(B) Issuers and size/book-to-market matched control firms (I=5,365)							
Liquidity measured using turnover (LMH)							
Issuer	0.40 (0.099)	0.95 (0.000)	1.06 (0.000)	−0.14 (0.114)	−0.12 (0.183)	−0.40 (0.014)	0.849
Match	0.37 (0.027)	0.95 (0.000)	1.05 (0.000)	−0.03 (0.648)	−0.13 (0.025)	−0.27 (0.025)	0.883
Issuer−match	0.02 (0.849)	0.00 (1.000)	0.01 (0.683)	−0.12 (0.019)	0.01 (0.898)	−0.13 (0.082)	0.098
Liquidity measured as delayed price response to order flow (Pastor and Stambaugh, 2003, PS *)*							
Issuer	0.28 (0.198)	1.11 (0.000)	1.20 (0.000)	−0.20 (0.029)	−0.14 (0.140)	−0.08 (0.141)	0.844
Match	0.30 (0.060)	1.05 (0.000)	1.14 (0.000)	−0.06 (0.296)	−0.14 (0.019)	−0.05 (0.193)	0.881
Issuer−match	−0.01 (0.900)	0.05 (0.048)	0.06 (0.116)	−0.13 (0.007)	−0.00 (0.970)	−0.03 (0.208)	0.092

Table 6
Jensen's alphas and factor loadings for characteristic based factors for stock portfolio stock portfolios of firms undertaking seasoned equity offerings (SEOs) and their matched control firms, 1964–1997

The model is:

$$r_{pt} = \alpha_p + \beta_1 \mathrm{RM}_t + \beta_2 \mathrm{SMB}_t + \beta_3 \mathrm{HML}_t + \beta_4 \mathrm{UMD}_t + \beta_5 \mathrm{Liquidity}_t + e_t$$

where r_{pt} is either a portfolio excess return or a return on a zero investment portfolio that is long issuers and short in matching firms. Portfolios are first formed in March 1964 and held until December 1997. Sample source: Eckbo, Masulis, and Norli (2000). RM is the excess return on a value weighted market index, SMB and HML are the Fama and French (1993) size and book-to-market factors, UMD is a momentum factor and is constructed as the return difference between the one-third highest and one-third lowest CRSP performers over the past 12 months. The factor is constructed by Ken French and is downloaded from his web-page. LMH (monthly volume divided by number of shares outstanding) is a liquidity factor that is constructed using the same algorithm used to construct HML. To construct LMH, we start in 1972 and form two portfolios based on a ranking of the end-of-year market value of equity for all NYSE/AMEX stocks and three portfolios formed using NYSE/AMEX stocks ranked on turnover. Next, six portfolios are constructed from the intersection of the two market value and the three turnover portfolios. Monthly value-weighted returns on these six portfolios are calculated starting in January 1973. Portfolios are reformed in January every year using firm rankings from December the previous year. The return on the LMH portfolio is the difference between the equal-weighted average return on the two portfolios with low turnover and the equal-weighted average return on the two portfolios with high turnover. The PS factor is constructed as in Pastor and Stambaugh (2003) using order-flow related return reversals. In the panel headings, T is the number of months in the time series regression, N is the average number of firms in the portfolio, and I is the number of issues used to construct the portfolio. The coefficients are estimated using OLS. Standard errors are computed using the heteroskedasticity consistent estimator of White (1980). The numbers in parentheses are p-values.

		Factor betas (T=406, N=361)					
Portfolio	$\hat{\alpha}$	RM	SMB	HML	UMD	Liquidity	A-Rsq
(A) Industrial issuers and size matched control firms (I=1,704)							
Liquidity measured using turnover (LMH)							
Issuer	−0.03 (0.745)	1.08 (0.000)	0.74 (0.000)	−0.02 (0.684)	−0.11 (0.000)	−0.32 (0.000)	0.939
Match	−0.15 (0.070)	0.98 (0.000)	0.82 (0.000)	0.33 (0.000)	−0.09 (0.001)	−0.08 (0.107)	0.925
Issuer−match	0.12 (0.333)	0.10 (0.001)	−0.08 (0.075)	−0.34 (0.000)	−0.02 (0.487)	−0.24 (0.000)	0.280
Liquidity measured as delayed price response to order flow (Pastor and Stambaugh, 2003, PS *)*							
Issuer	−0.16 (0.070)	1.20 (0.000)	0.91 (0.000)	−0.07 (0.065)	−0.08 (0.003)	−0.06 (0.002)	0.934
Match	−0.19 (0.020)	1.02 (0.000)	0.86 (0.000)	0.31 (0.000)	−0.08 (0.002)	−0.04 (0.035)	0.925
Issuer−match	0.03 (0.837)	0.18 (0.000)	0.04 (0.293)	−0.38 (0.000)	−0.00 (0.903)	−0.02 (0.501)	0.259
(B) Industrial issuers and size/book-to-market matched control firms (I=1,485)							
Liquidity measured using turnover (LMH)							
Issuer	0.13 (0.223)	1.06 (0.000)	0.53 (0.000)	0.07 (0.071)	−0.14 (0.000)	−0.37 (0.000)	0.905
Match	0.03 (0.718)	1.06 (0.000)	0.61 (0.000)	0.17 (0.000)	−0.14 (0.000)	−0.03 (0.607)	0.914
Issuer−match	0.10 (0.450)	0.00 (1.000)	−0.08 (0.079)	−0.10 (0.040)	0.00 (0.949)	−0.34 (0.000)	0.113
Liquidity measured as delayed price response to order flow (Pastor and Stambaugh, 2003, PS *)*							
Issuer	−0.03 (0.812)	1.19 (0.000)	0.73 (0.000)	0.01 (0.744)	−0.11 (0.000)	−0.07 (0.000)	0.897
Match	0.01 (0.932)	1.08 (0.000)	0.63 (0.000)	0.16 (0.000)	−0.13 (0.000)	−0.04 (0.055)	0.914
Issuer−match	−0.03 (0.803)	0.11 (0.001)	0.09 (0.047)	−0.15 (0.003)	0.03 (0.474)	−0.04 (0.157)	0.071

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