

Initial Public Offerings: Technology Stock IPOs

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December 4, 2014

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Median Age and Fraction of IPOs with VC and Buyout Backing, 1980-2013

There are 7,854 IPOs after excluding those with an offer price below \$5.00 per share, unit offers, ADRs, closed-end funds, oil & gas limited partnerships, acquisition companies, REITs, bank and S&L IPOs, and firms not listed on CRSP. Missing numbers are supplemented by direct inspection of prospectuses on EDGAR, information from Dealogic for IPOs after 1991, Howard and Co.'s *Going Public: The IPO Reporter* from 1980-1985, the Graeme Howard-Todd Huxster collection of IPO prospectuses for 1975-2006, and the Stanford GSB microfiche collection of registration statements from the 1980s. Tech stocks are defined as internet-related stocks plus other technology stocks, not including biotech. Loughran and Ritter (2004) list the SIC codes in their appendix 3 and sources of founding dates in appendix 1. Age is defined as the year of the IPO minus the year of founding. For buyout-backed IPOs, the founding date of the predecessor company is used. For rollups, the founding date of the oldest acquired company is used in most cases. Private equity (PE) or buyout-backed IPOs were restricted to "reverse LBOs" in the 1980s and 1990s. Jerry Cao has assisted with providing information on which IPOs are buyout-backed.

The financial backers of some companies are easy to classify, such as when Sequoia Capital and Kleiner Perkins invested in Google, or when KKR invested in Dollar General. But other situations involve growth capital investing, as when Warburg Pincus finances a company that rolls up some doctors' offices. With just two categories (VC and buyout), there is some arbitrariness in the categorization of IPOs backed by growth capital investors. 308 growth capital-backed IPOs are classified as VC-backed.

The definition of technology stocks has been changed from that in Loughran and Ritter (2004 *Financial Management*), with SIC=3559, 3576, and 7389 added to tech. Some 7389 (business services) companies have had their SIC codes changed into non-tech categories, such as consulting and two new SIC codes: 5614 for telemarketing firms and 7388 for non-tech business services such as Sotheby's Auctions.

(table on the next page)

Year	Number of IPOs	Median Age	VC-backed		Buyout-backed		Technology IPOs	
			No.	%	No.	%	No.	% VC-backed
1980	71	6	23	32%	1	1%	22	64%
1981	192	8	53	28%	1	1%	72	40%
1982	77	5	21	27%	2	3%	42	36%
1983	451	7	115	25%	12	3%	173	38%
1984	173	8	45	26%	3	2%	50	52%
1985	187	9	39	21%	18	9%	37	43%
1986	393	8	79	20%	42	11%	77	40%
1987	285	7	66	23%	42	15%	58	66%
1988	102	8	32	31%	9	9%	28	61%
1989	113	8	40	35%	10	9%	35	66%
1990	110	8	42	38%	14	13%	31	74%
1991	286	9	116	41%	72	25%	70	63%
1992	412	10	138	33%	98	24%	113	59%
1993	509	9	171	34%	79	16%	126	70%
1994	403	8	130	32%	22	5%	117	56%
1995	461	7	186	40%	30	7%	204	55%
1996	676	7	263	39%	35	5%	274	55%
1997	474	9	133	28%	38	8%	173	42%
1998	281	8	77	27%	30	11%	113	48%
1999	477	5	275	58%	31	6%	371	66%
2000	381	6	242	64%	32	8%	261	69%
2001	79	12	32	41%	21	27%	23	70%
2002	66	15	23	35%	20	30%	20	65%
2003	63	11	24	38%	21	33%	18	61%
2004	173	8	79	46%	43	25%	61	66%
2005	159	13	46	29%	67	42%	45	49%
2006	157	13	54	34%	68	43%	48	52%
2007	159	9	71	45%	31	19%	75	67%
2008	21	14	9	43%	3	14%	6	67%
2009	41	15	12	29%	19	46%	14	43%
2010	91	10	40	44%	27	30%	33	73%
2011	81	11	44	54%	18	22%	36	81%
2012	93	12	48	52%	28	30%	39	87%
2013	157	12	76	48%	36	23%	43	72%
2014	192	11	119	62%	36	18%	46	76%
1980-1989	2,044	7	513	25%	140	7%	594	46%
1990-1994	1,720	9	597	35%	285	17%	457	63%
1995-1998	1,892	8	659	35%	133	7%	764	51%
1999-2000	858	5	517	60%	63	7%	632	67%
2001-2013	1,340	11	558	42%	402	30%	461	66%
1980-2013	7,854	8	2,844	36%	1,023	13%	2,908	58%

Table 4a (2014 numbers updated on November 30, 2014)

Technology Company IPOs, 1980-2013

There are 2,908 tech stock IPOs, not including IPOs from the first eleven months of 2014, after excluding those with an offer price below \$5.00 per share, unit offers, ADRs, closed-end funds, natural resource limited partnerships (and most other LPs, but not buyout firms such as Carlyle Group), acquisition companies, REITs, bank and S&L IPOs, and firms not listed on CRSP. Missing and questionable numbers from the SDC new issues database are supplemented by direct inspection of prospectuses on EDGAR, information from Dealogic for IPOs after 1991, Howard and Co.'s *Going Public: The IPO Reporter* from 1980-1985, and the Graeme Howard-Todd Huxster collection of IPO prospectuses for 1975-2006. Tech stocks are defined as internet-related stocks plus other technology stocks including telecom, but not including biotech. Loughran and Ritter (2004) list the SIC codes in their appendix 3 and sources of founding dates in appendix 1. The definition of technology stocks has been changed from that in Loughran and Ritter (2004 *Financial Management*), with SIC=3559, 3576, and 7389 added to tech. Some 7389 (business services) companies have had their SIC codes changed into non-tech categories, such as consulting and two new SIC codes: 5614 for telemarketing firms and 7388 for non-tech business services such as Sotheby's Auctions.

For buyout-backed IPOs, the founding date of the predecessor company is used. Price-to-sales ratios are computed using both the offer price (OP) and the first closing market price (MP) for computing the market capitalization of equity. Market cap is calculated using the post-issue shares outstanding, with all share classes included in the case of dual-class companies. The undiluted number of shares is used, which in some cases (e.g., Facebook, Twitter, and Castlight Health) understates the market cap due to the existence of substantial amounts of in-the-money employee stock options that are highly likely to be exercised. Sales are the last twelve months (LTM) revenues as reported in the prospectus. The median sales, in millions, is expressed in both nominal dollars and in dollars of 2014 purchasing power using the CPI. The median age, in years, is the number of years since the calendar year of the founding date and the calendar year of the IPO. The percentage of IPOs that are profitable measures profitability using trailing LTM earnings (usually using after extraordinary items earnings, and usually using pro forma numbers that are computed assuming that any recent or concurrent mergers have already occurred, and the conversion of convertible preferred stock into common stock). In some cases, last fiscal year earnings are used when LTM earnings are unavailable.

Even concepts like market cap (for the price-to-sales ratios) become ambiguous when you realize that companies like Facebook have many deep in-the-money options outstanding, so whether you use the fully diluted number of shares or the undiluted number can affect the calculations substantially for some companies.

(table on the next page)

Year	Number of Tech IPOs	Proceeds in \$billions		Median Price-to-sales		Median sales, \$mm		Median age	% profitable
		VC-backed	Technology	OP	MP	Nominal	\$2014		
1980	22	388	389	3.4	3.8	16.2	48.8	6.5	91%
1981	72	648	852	3.5	3.6	12.9	34.8	9	88%
1982	42	490	648	4.2	4.5	10.5	26.2	5	83%
1983	173	2,768	3,271	5.7	6.5	8.6	20.6	6	71%
1984	50	614	543	2.4	2.5	9.8	22.5	6.5	80%
1985	37	667	375	2.0	2.4	13.4	29.8	7	84%
1986	77	1,558	1,217	3.4	3.6	13.0	27.8	6	74%
1987	58	1,315	1,324	3.2	3.2	18.3	38.4	5.5	86%
1988	28	674	888	2.8	2.9	24.0	48.6	5.5	79%
1989	35	869	748	3.4	4.0	31.5	61.0	6	77%
1990	31	1,085	747	3.6	3.7	29.1	53.5	9	94%
1991	70	3,887	2,738	3.2	3.7	34.5	60.0	9	74%
1992	113	4,970	5,847	3.4	3.6	22.8	38.7	8	65%
1993	126	5,911	5,435	3.0	3.6	27.0	44.3	8	74%
1994	117	3,726	3,659	3.7	4.2	21.0	33.6	8	70%
1995	204	7,023	9,781	4.6	5.7	21.6	33.6	8	71%
1996	274	11,667	16,185	6.9	8.3	16.7	25.3	7	47%
1997	173	4,993	7,447	5.2	5.7	21.5	31.7	7	50%
1998	113	3,882	8,118	8.8	11.9	22.1	32.0	6	36%
1999	371	22,012	33,792	26.5	42.8	12.1	17.2	4	14%
2000	261	23,304	42,498	31.7	48.9	12.1	16.8	5	14%
2001	23	2,658	5,773	8.1	13.4	22.8	30.5	9	30%
2002	20	1,956	2,587	2.9	3.1	95.2	125.9	9	40%
2003	18	1,789	2,242	4.1	4.6	86.2	111.1	7	39%
2004	61	7,183	9,191	6.4	7.1	55.5	70.2	8	44%
2005	45	3,676	6,994	4.5	4.5	68.0	83.6	9	36%
2006	48	4,661	4,873	5.5	6.3	57.6	68.0	9	50%
2007	75	9,820	11,371	6.5	8.0	70.0	81.0	8	29%
2008	6	863	1,194	4.9	5.7	156.7	173.8	14	67%
2009	14	1,697	4,125	3.0	3.6	174.3	193.3	11	71%
2010	33	3,873	4,347	3.4	3.9	119.5	129.2	11	64%
2011	36	8,603	9,412	6.1	6.6	141.3	150.3	10	36%
2012	39	21,031	20,250	4.4	4.9	108.1	111.7	9	44%
2013	43	11,553	8,486	5.3	6.1	105.8	107.6	9	28%
2014	46	16,084	8,338	6.1	7.0	92.2	92.2	11	20%
1980-2013	2,908	181,727	237,176	5.8	6.9	20.7	34.5	7	51%

Table 4b (2014 numbers updated on November 30, 2014)

Technology and Biotech Company IPOs, 1980-November 2014

There are 2,908 tech stock IPOs from 1980-2013, not including IPOs from 2014, after excluding those with an offer price below \$5.00 per share, unit offers, ADRs, closed-end funds, partnerships, acquisition companies, REITs, bank and S&L IPOs, and firms not listed on CRSP. Three deals, from 1998, 2005, and 2010, have been removed relative to the April 2014 sort because they had been misclassified. Missing and questionable numbers from the SDC new issues database are supplemented by direct inspection of prospectuses on EDGAR, information from Dealogic for IPOs after 1991, Howard and Co.'s *Going Public: The IPO Reporter* from 1980-1985, and the Graeme Howard-Todd Huxster collection of IPO prospectuses for 1975-2006. Tech stocks are defined as internet-related stocks plus other technology stocks including telecom, but not including biotech. Loughran and Ritter (2004) list the SIC codes in their appendix 3 and sources of founding dates in appendix 1. The definition of technology stocks has been changed from that in Loughran and Ritter (2004 *Financial Management*), with SIC=3559, 3576, and 7389 added to tech. Some 7389 (business services) companies have had their SIC codes changed into non-tech categories, such as consulting and two new SIC codes that I created: 5614 for telemarketing firms and 7388 for non-tech business services such as Sotheby's Auctions.

Biotech is defined as SIC=2830, 2833, 2834, 2835, 2836, and 8731.

Sales are the last twelve months (LTM) revenues as reported in the prospectus. The median sales, in millions, is expressed in dollars of 2014 purchasing power using the CPI. Pro forma numbers are usually used if there have been recent mergers or mergers that coincide with the IPO. The percentage of IPOs that are profitable measures profitability using trailing LTM earnings (usually using after extraordinary items earnings, and usually using pro forma numbers that are computed assuming that any recent or concurrent mergers have already occurred, and the conversion of convertible preferred stock into common stock). In some cases, last fiscal year earnings are used when LTM earnings are unavailable.

(table on the next page)

Year	Number of IPOs			% Profitable			Median sales (\$2014, millions)		
	Tech	Biotech	Other	Tech	Biotech	Other	Tech	Biotech	Other
1980	22	3	46	91%	67%	70%	48.8	17.1	64.4
1981	72	10	110	88%	30%	85%	34.8	4.1	36.1
1982	42	2	33	83%	50%	79%	26.2	3.3	25.0
1983	173	21	257	71%	43%	86%	20.6	6.1	73.9
1984	50	2	121	80%	100%	84%	22.5	113.5	57.9
1985	37	5	145	84%	40%	87%	29.8	10.4	89.0
1986	77	25	291	74%	32%	84%	27.8	9.0	79.3
1987	58	11	216	86%	18%	85%	38.4	5.9	92.4
1988	28	2	72	79%	0%	87%	48.6	8.2	195.7
1989	35	4	74	77%	0%	84%	61.0	2.2	102.1
1990	31	4	75	94%	0%	87%	53.5	3.8	106.5
1991	70	33	183	74%	15%	88%	60.0	5.7	129.0
1992	113	33	266	65%	18%	80%	38.7	2.2	116.8
1993	126	28	355	74%	21%	74%	44.3	2.6	100.9
1994	117	20	266	70%	20%	80%	33.6	2.6	83.5
1995	204	22	235	71%	14%	75%	33.6	4.2	95.4
1996	274	47	355	47%	17%	74%	25.3	3.9	82.8
1997	173	21	280	50%	14%	76%	31.7	8.0	91.4
1998	113	12	156	36%	42%	69%	32.0	18.9	104.3
1999	371	11	95	14%	27%	63%	17.2	17.0	163.1
2000	261	56	64	14%	11%	50%	16.8	5.5	165.1
2001	23	6	50	30%	0%	66%	30.5	0.2	474.5
2002	20	5	41	40%	50%	63%	125.9	189.9	570.5
2003	18	8	37	39%	0%	76%	111.1	0.5	519.6
2004	61	30	82	44%	7%	70%	70.2	4.4	250.4
2005	45	16	98	36%	13%	70%	83.6	15.2	266.6
2006	48	24	85	50%	8%	80%	68.0	4.0	393.7
2007	75	19	65	29%	5%	74%	81.0	1.7	281.8
2008	6	1	14	67%	0%	57%	173.8	0.3	223.9
2009	14	3	24	71%	67%	71%	193.3	41.7	498.8
2010	33	11	47	64%	0%	71%	129.2	0.0	349.0
2011	36	8	37	36%	0%	60%	150.3	3.3	343.7
2012	39	10	44	44%	0%	75%	111.7	0.5	347.1
2013	43	41	73	28%	10%	56%	107.6	10.9	420.8
2014	46	72	74	20%	7%	56%	92.2	0.0	268.2
1980-2013	2,908	554	4,392	51%	17%	77%	\$34.5	\$5.3	\$108.8

Table 4c (updated November 30, 2014)

VC-backed, Growth Capital-backed, and Buyout-backed IPOs, 1980-2013

There are 7,854 IPOs after excluding those with an offer price below \$5.00 per share, unit offers, ADRs, closed-end funds, natural resource limited partnerships, special purpose acquisition companies (SPACs), REITs, bank and S&L IPOs, small best efforts offerings, and firms not listed on CRSP within six months of the IPO. Missing numbers in the Thomson Reuters new issues database are found by direct inspection of prospectuses on EDGAR, information from Dealogic for IPOs after 1989, Howard and Co.'s *Going Public: The IPO Reporter* from 1980-1985, and the Graeme Howard-Todd Huxster collection of IPO prospectuses for 1975-1996. Some foreign company IPOs from 1997-2001 that did not use ADRs but did not file electronically, and therefore do not have a prospectus available on EDGAR, were also accessed from the Graeme Howard-Todd Huxster database. Additional information was collected from microfiches at Stanford's GSB library. Tech stocks are defined as internet-related stocks plus other technology stocks including telecom, but not including biotech. Loughran and Ritter (2004) list the SIC codes in their appendix 3 and sources of founding dates in appendix 1, and I have slightly updated the classifications.

Growth capital-backed IPOs are IPOs with a financial sponsor that, unlike a buyout-sponsored deal, typically owns far less than 90% of the equity prior to the IPO. Furthermore, many growth capital-backed IPOs have debt in their capital structure. The main criteria for classifying a financial sponsor as growth capital rather than venture capital is whether the company is investing in tangible assets (e.g., stores or hospitals) or intangibles (e.g., R&D); this is highly correlated with the industry of the company: restaurants, retail operations such as clothing store chains, healthcare operations (doctors' offices and dental offices), and retirement homes are generally classified as growth capital-backed. Many growth capital-backed IPOs are involved in rollups of a fragmented industry, where the financial sponsor has provided capital to make acquisitions to consolidate a fragmented industry, such as funeral homes. If a company is growing via acquisitions, it would generally be categorized as growth capital-backed rather than venture-backed. Jerry Cao has provided information on which IPOs are buyout-backed. 355 growth capital-backed IPOs are not classified as VC-backed in this table.

(table on the next page)

Year	Number of IPOs	Financial sponsor- backed		VC-backed		Growth capital- backed		Buyout-backed	
		No.	%	No.	%	No.	%	No.	%
1980	71	24	34%	20	28%	3	4%	1	1%
1981	192	54	28%	44	23%	9	5%	1	1%
1982	77	23	30%	19	25%	2	2%	2	3%
1983	451	127	28%	103	23%	12	3%	12	3%
1984	173	48	28%	38	22%	7	4%	3	2%
1985	187	57	30%	28	15%	11	6%	18	10%
1986	393	121	31%	72	18%	7	2%	42	11%
1987	285	108	38%	61	22%	5	1%	42	15%
1988	102	41	40%	25	25%	7	7%	9	9%
1989	113	50	44%	30	27%	10	9%	10	9%
1990	110	56	51%	37	34%	5	5%	14	13%
1991	286	188	66%	97	34%	19	7%	72	25%
1992	412	236	57%	121	29%	17	4%	98	24%
1993	509	250	49%	159	31%	12	2%	79	16%
1994	403	152	38%	114	28%	16	4%	22	5%
1995	461	216	47%	157	34%	29	6%	30	7%
1996	676	298	44%	218	32%	45	7%	35	5%
1997	474	171	36%	102	22%	31	7%	38	8%
1998	281	107	38%	59	21%	18	6%	30	11%
1999	477	306	64%	259	54%	16	3%	31	6%
2000	381	274	72%	239	63%	3	1%	32	8%
2001	79	53	67%	22	28%	10	13%	21	27%
2002	66	43	65%	11	17%	12	18%	20	30%
2003	63	45	71%	20	32%	4	6%	21	33%
2004	173	122	71%	73	42%	6	3%	43	25%
2005	159	113	71%	40	25%	6	4%	67	42%
2006	157	122	78%	52	33%	2	1%	68	43%
2007	159	102	64%	63	40%	8	5%	31	19%
2008	21	12	57%	7	33%	2	10%	3	14%
2009	41	31	76%	12	29%	0	0%	19	46%
2010	91	67	74%	38	42%	2	2%	27	30%
2011	81	62	77%	40	49%	4	5%	18	22%
2012	93	76	82%	45	48%	3	3%	28	30%
2013	157	112	71%	64	41%	12	8%	36	23%
1980-1989	2,044	653	32%	440	22%	73	4%	140	7%
1990-1994	1,720	882	51%	528	31%	69	4%	285	17%
1995-1998	1,892	792	42%	536	28%	123	7%	133	7%
1999-2000	858	580	67%	498	58%	19	2%	63	7%
2001-2013	1,340	960	71%	487	36%	71	5%	402	30%
1980-2013	7,854	3,865	49%	2,489	32%	355	5%	1,023	13%

Table 9

Fraction of IPOs with Negative Earnings, 1980-2013 (November 30, 2014)

IPOs with an offer price below \$5.00 per share, unit offers, ADRs, closed-end funds, partnerships, acquisition companies, REITs, bank and S&L IPOs, and firms not listed on CRSP within six months of the offer date are excluded. When available, we use the earnings per share for the most recent twelve months (commonly known as LTM for last twelve months) prior to going public. When a merger is involved, we use the pro forma numbers (as if the merger had already occurred). When unavailable, we use the most recent fiscal year EPS numbers. Missing numbers are supplemented by direct inspection of prospectuses on EDGAR, EPS information from Dealogic for IPOs after 1991, and Howard and Co.'s *Going Public: The IPO Reporter* from 1980-1995. Remaining missing numbers have been found in the Graeme Howard-Todd Huxster collection of IPO prospectuses and the Stanford Business School microfiche collection of prospectuses from the 1980s. Tech stocks are defined as internet-related stocks plus other technology stocks, not including biotech. Loughran and Ritter (2004) list the SIC codes in their appendix 3 and sources of founding dates in appendix 1.

2014 numbers are as of November 30, 2014.

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Year	Number of IPOs	No. of IPOs with missing EPS	Percentage Tech Stocks	Percentage of IPOs with EPS<0	Mean First-day Returns	
					EPS<0	EPS≥0
1980	71	0	31%	24%	7.1%	16.5%
1981	192	0	37%	17%	8.0%	5.4%
1982	77	0	55%	19%	6.4%	12.1%
1983	451	0	38%	22%	14.0%	8.8%
1984	173	0	29%	17%	10.5%	2.2%
1985	187	0	20%	15%	5.2%	6.6%
1986	393	1	20%	21%	8.8%	5.4%
1987	285	0	20%	17%	5.1%	5.8%
1988	102	0	27%	17%	7.0%	5.4%
1989	113	0	31%	22%	9.4%	7.8%
1990	110	0	28%	15%	9.5%	11.0%
1991	286	0	24%	24%	9.4%	12.7%
1992	412	0	27%	29%	10.3%	10.3%
1993	509	0	25%	29%	12.5%	12.8%
1994	403	0	29%	26%	8.0%	10.4%
1995	461	0	44%	30%	21.8%	21.0%
1996	676	0	41%	41%	16.7%	17.6%
1997	474	0	36%	36%	12.6%	14.9%
1998	281	0	40%	46%	32.2%	13.2%
1999	477	0	78%	76%	80.8%	40.2%
2000	381	0	69%	80%	59.4%	43.7%
2001	79	0	29%	49%	15.3%	13.1%
2002	66	0	30%	45%	5.6%	12.0%
2003	63	0	29%	44%	10.0%	13.2%
2004	173	0	35%	50%	11.9%	12.7%
2005	159	0	28%	45%	7.3%	12.8%
2006	157	0	31%	40%	7.3%	15.4%
2007	159	0	47%	55%	13.8%	14.3%
2008	21	0	29%	43%	1.8%	9.8%
2009	41	0	34%	29%	12.8%	8.6%
2010	91	0	36%	41%	6.9%	11.1%
2011	81	0	44%	57%	10.5%	17.1%
2012	93	0	42%	46%	22.7%	13.7%
2013	157	0	27%	64%	20.4%	22.5%
2014	192	0	24%	71%	16.5%	12.1%
1980-1989	2,044	1	29%	19%	9.3%	6.8%
1990-1994	1,720	0	27%	26%	10.2%	11.5%
1995-1998	1,892	0	40%	38%	19.5%	17.3%
1999-2000	858	0	74%	78%	71.0%	41.6%
2001-2013	1,340	0	34%	49%	13.2%	13.9%

Figure 2: See Table 9 for details.

Fraction of IPOs with Negative EPS and Fraction of Tech Stocks, 1980-2013

