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THE VALUE OF MARKETABILITY AS ILLUSTRATED IN INITIAL PUBLIC OFFERINGS OF COMMON STOCK
(Eighth in a Series)
November 1995 through April 1997

By John D. Emory, ASA

Stockholders in hundreds of thousands of closely held companies are intimately affected by the value of their shares, even though they lack a public market. A critical aspect in determining the fair market value of closely held securities is the discount for lack of marketability. The term discount for lack of marketability is a general term in business valuation referring to impairment of value for reasons relating to marketability and/or liquidity.

Restricted Stock Studies

As an appraiser of privately held securities in the late 1960s and early 1970s, I studied purchase discounts which occurred when registered investment companies purchased restricted securities and found average discounts of about 35%. In most of those cases there would have been an established market for the restricted securities when and as trading restrictions were removed.

The restricted stock was purchased with an eye toward eventual marketability as rights of registration were usually included. The average discount from ten studies of restricted stock transactions between the mid-1960s and the early 1990s was 33%. (1)

Much of the more recent restricted stock discount data arises from the private placement of stock that was restricted under SEC Rule 144, and which had not been held for the then required two-year holding period before the stock could be sold into the public market, hence a discount. There is now an emerging and significant market for restricted 144 Stock. Not only are there a great many hedge funds that can buy 144 Stock, but profit sharing plans, insurance companies, banks, investment companies, trust companies, etc. can buy restricted 144 stock and discounts have declined. As of April 29, 1997, the SEC reduced the Rule 144 holding period from two years to one year.

An important and detailed study, entitled *Analysis of Restricted Stocks of Public Companies: 1980 – 1995*, is in the process of being published by Management Planning, Inc. as a chapter in Christopher Mercer's soon to be released book on quantifying discounts for lack of marketability.(2) It provides significant transactional detail for independent study and analysis and in general validates the older studies. For the 49 private transactions analyzed in detail, the average (mean) discount was 27.7% and the median discount was 28.8%. Small companies tended to have larger discounts than large companies.

Pre-IPO Studies

In 1980, in an effort to better quantify the critical importance of marketability as an element of value, I started to study the price relationship between stock transactions and subsequent initial public offerings (IPOs) of the same stock as described in the IPO prospectus.

From the outset of my work at Robert W. Baird & Co. Incorporated ("Baird"), I had been involved in the pricing of IPOs and was very familiar with prospectuses as I assisted drafting those where we were the managing underwriter. It was clear to me that anticipated IPOs did not always occur, the price of the stock in an IPO was not set until immediately before the IPO and that marketability was very valuable.

It was my thought that if the prices at which private transactions took place before the IPO could be related to the price at which the stock was offered subsequently to the public, another gauge as to the magnitude of the value of marketability might be available. This has indeed proved to be the case. A prospectus is obliged to identify securities transactions between principals and insiders since the registrants last fiscal year prior to the offering.

In order to provide a reasonable comparison of prices before and at the IPO, I felt it necessary both for the company to have been reasonably sound and for the private transaction to have occurred within a period of five months prior to the offering date. Since an initial public offering often takes four or five months from conception to completion, the transactions mentioned in the prospectuses in the study would almost certainly have reflected the likelihood of marketability and any other value adjustment associated with being a public company.

In keeping with these guidelines and prior studies, development stage companies, companies with a history of real operating losses and companies whose IPO price was less than $5 per share have been eliminated from consideration. In the remaining situations the companies were promising in nature, and their securities had good potential for becoming readily marketable. Why else would investors have bought the unregistered stock and why would a bona fide investment banker pursue a firm underwriting commitment? It should be noted that almost all of the major investment banks are represented as lead underwriters of the IPOs used in this study, as has been the case in previous studies.

The transactions primarily took one of two forms: (1) the granting of stock options with an exercise price equal to the stock's then fair market value; or (2) the sale of stock or, in a few situations, the sale of securities convertible into stock in which case we conservatively accepted the conversion price as being indicative of the fair market value of the stock. In most cases, the transactions were stated to have been, or could reasonably be expected to have been, at fair market value. All ultimately would have had to be able to withstand SEC, IRS or judicial review, particularly in light of the subsequent public offering.

While the sale of stock can be rather straightforward, the granting of an option typically depends on a determination of fair market value by the board of directors if there is no public market for the stock. Our experience at Baird with stock options granted within a few months of an IPO, when their exercise price is substantially lower than the anticipated offering price as stated in the registration statement, is that the SEC will raise a question as to the issuance of “cheap stock”. This issue must be satisfactorily resolved before the SEC or state “blue sky” commissions will permit the shares to be sold to the public. As a result, directors and underwriters take this issue very seriously and such stock option exercise prices must be very defensible. A surprise in the current study was the many IPO companies that granted stock options having an exercise price at what was subsequently determined to be below fair market value and therefore took a charge to earnings.

The 1995-1997 study is the eighth in a series of like studies done in the same way, over a period of approximately 17 ½ years in 18-month segments. The studies were done in very diverse market conditions yet the results were not dissimilar. As examples, in the 1980-1981 study the prime rate of interest went from 15.25% to 20% and the Dow Jones Industrial Average (“DJIA”) was up 16.5%. In the 1985-1986 study, the prime rate went from 10.75% to 8.5% while the DJIA was up 58%. The 1987-1989 study encompassed the October 1987 stock market crash. The 1992-1993 study saw a strong IPO market, modestly declining interest rates and a generally firm stock market that rose 10% as measured by the DJIA. The 1994-1995 study saw a very difficult bond market and the DJIA rose 21%, 19% in the last 6 months of the 18 month study period.

The 1995-1997 study saw a strong move in the stock market as measured by the DJIA, going from 4,766.68 to 7,008.99 for a 47% move. Interest rates were relatively flat and the market for IPOs could be considered hot.

In the eight studies, over 2,200 prospectuses were reviewed and 310 qualifying transactions were found. The mean discount for the 310 transactions in the eight studies was 44% and the median was 43%.

In this study, we reviewed 732 prospectuses for IPOs and found 91 transactions that met our criteria. These transactions took place at 43% average (mean) and 42% median discounts from the price at which the stock subsequently came to market (See Appendix).

The transactions were relatively well spaced within the five month time frame. The discounts tended to be somewhat lower close to the IPO date and higher four or five months prior to the IPO date, although the relationship was not clear.

Study	# of IPO Prospectuses Reviewed	# of Qualifying Transactions	Mean Discount	Median Discount
1995 – 1997	732	91	43%	42%
1994 – 1995 (3)	318	46	45%	45%
1992 – 1993 (4)	443	54	45%	44%
1990 – 1992 (5)	266	35	42%	40%
1989 – 1990 (6)	157	23	45%	40%
1987 – 1989 (7)	98	27	45%	45%
1985 – 1986 (8)	130	21	43%	43%
1980 – 1981 (9)	97	13	60%	66%
All 8 Studies	2,241	310	44%	43%

Of the 310 transactions in the eight studies, 67 were sale transactions and 239 were option transactions. Of particular interest is that, on average, sale transactions have higher discounts than option transactions and that this difference has significantly increased.

The eight studies' mean discount for the 67 sale transactions was 50%, the median was 51%. The 22 sale transactions in the 1995-1997 study took place at mean and median discounts of 54% and 61%, respectively. The 13 sale transactions in the 1994-1995 study took place at mean and median discounts of 46% and 47%, respectively, while the 7 sale transactions in the 1992-1993 study took place at 49% and 46%.

	Sale Transactions		
Study	**# of Transactions**	**Mean Discount**	**Median Discount**
1995 – 1997	22	54%	61%
1994 – 1995	13	46%	47%
1992 – 1993	7	49%	46%
All 8 Studies	67	50%	51%

For further information, we have included an additional schedule of the 1995-1997 sale transactions which includes the size of the transaction in shares as well as a short description of the transaction. Size of transaction does not seem to be much of an influence on the size of the discount.

Discounts arising from option transactions in the current 1995-1997 study were significantly lower than those from sale transactions. This is not too surprising in light of the cheap stock concerns and high public stock valuations.

The eight studies' mean discount for the 239 option transactions was 43%, the median was also 43%. The mean and median discounts from the 69 option transactions in the 1995 – 1997 study were 39% and 40%, respectively. These were down from the 1994 – 1995 study's 44% and 43% discounts which were themselves down from 1992 – 1993 study's 45% and 44%.

	Option Transactions		
Study	# of Transactions	Mean Discount	Median Discount
1995 – 1997	69	39%	40%
1994 – 1995	33	44%	43%
1992 – 1993	46	45%	44%
All 8 Studies	239	43%	43%

Recent discussions with several appraisers indicated that their clients in general had made it clear that they did not want cheap stock problems. This may explain why option related discounts dropped in the current study. The preponderance of lower discounts arising from the granting of options tends to keep the study's overall average discount lower than otherwise would be the case.

There may be changes between the pre-IPO price and the IPO itself, which can impact pricing at those times, in addition to lack of marketability. These could include changes in financial performance, capitalization, management, as well as unforeseen external factors. However, marketability, or the promise of marketability, tends to account for most of the differences in pricing pre-IPO and at the IPO.

In my experience IPOs are sold primarily to relatively sophisticated, rational investors. Reputable investment bankers do not sell IPOs to their customers expecting that they will be a bad investment. On pre-IPO roadshows around the country, the IPO company management is subject to intensive questioning from sophisticated investors and money managers about their company and its prospects. The above is mentioned because IPOs are priced on the basis of feedback and intense scrutiny from market participants.

Because more companies were coming to the market with no earnings and, in some cases, with no sales, a final cut of 38 transactions which otherwise would have met our criteria was made. This was to keep the companies used comparable to those in prior studies on a quality basis. It is of interest that the mean and median discounts for these eliminated 38 transactions were 48% and 47%, respectively versus the 43% and 42% found in the primary study.

Significance of Discount Averages

An excellent article entitled "Market Evidence - Has the Burden of Proof Shifted?" was written by Bradley A. Fowler, JD, ASA in his column "How Do You Handle It?" in the September 1995 issue of Business Valuation Review, of which he is Associate Editor. In it Mr. Fowler addresses the sometimes stated notion that specific "empirical" or "market" evidence that directly bears on the business interest being valued is required to sustain sizeable lack of marketability discounts. He does this in light of the multiple discount studies since 1970 that indicate average discounts that group around 30% to 45%. His following quote is significant regarding the usefulness of the discount studies' averages.

> The (IRS) 1994 manual, Valuation Training for Appeals Officers, at pages 1-11 provides an interesting and somewhat analogous discussion of the usefulness of observing market activity when there are enough samples to establish a pattern. It states: "While individual sales may deviate from the normal pattern of the market, an adequate number of sales will tend to reflect the pattern of buyers and sellers. The pattern of a sufficient number of sales is a good reflection of market value. If there is a sufficiently active market, a pattern will usually emerge. A good rule of thumb is to use enough comparables to develop a definite pattern. Most buyers and sellers will consult the market in their negotiations so that a sales pattern will often tend to be self-generating." [10]

Summary

The final question to be answered is that if the kinds of discounts found in the above studies are appropriate for promising situations where marketability is probable, but not a certainty, how much greater should discounts be for the more typical company's stock that has no marketability, little if any chance of ever becoming marketable, and is in a neutral to unpromising situation?

In summary, the size of the discount for lack of marketability depends upon the individual situation. While there is not one discount for lack of marketability applicable at all times and to all situations, it is apparent that the lack of marketability is one of the most important components of value, and the public marketplace emphasizes this point.

Endnotes

1) Pratt, Shannon P., Robert F. Reilly, and Robert P. Schweihs, Valuing a Business: The Analysis and Appraisal of Closely Held Companies, 3rd ed. Chicago, IL: Richard D. Irwin, 1996, page 343.

2) Mercer, Z. Christopher, Quantifying Marketability Discounts, Peabody Publishing LP, 1997.

3) Emory, John D., "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock." Business Valuation Review, December 1995, pp. 155-160.

4) Ibid., March 1994, pp. 3-7.

5) Ibid., December 1992, pp. 208-212.

6) Ibid., December 1990, pp. 114-116.

7) Ibid., June 1989, pp. 55-57.

8) Ibid., December 1986, pp. 12-14.

9) Ibid., September 1985, pp. 21-24.

10) Available from Commerce Clearing House, Inc. Chicago as IRS Valuation Guide for Income, Estate and Gift Taxes, Valuation training for Appeals Officers.

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DISCOUNTS FOR LACK OF MARKETABILITY

Eighth Robert W. Baird & Co. Incorporated Study

Fair Market Value Transactions Which Occurred Within Five Months Prior to an Initial Public Offering as Disclosed in the Prospectus

18 Months November 1995 through April 1997

		Transaction		Public Offering		% Discount[1]	Prior to[2] Offering (Millions)			Total	Market	
Company	Principal Business	Date	Price	Date	Price	From Public Offering Price	Equity	Sales	Type[3]	IPO Offer (Millions)	Cap. (Millions)	Lead Underwriter
99 Cent Only Stores	Deep-discount retailer	5/96	$10.99	5/96	$14.50	24	$2	$162	O	$62	$206	EVEREN Securities
Aavid Thermal Technologies	Provider of thermal mngt products	1/96	9.00	1/96	9.50	5	4	87	O	22	58	Montgomery
Abacus Direct	Marketing research services	5/96	4.20	9/96	14.00	70	2	12	O	71	133	Robertson, Stephens
Advanced Fibre Communications	Mfg digital loop carrier system	6/96	12.50	9/96	25.00	50	(8)	89	O	113	732	Morgan Stanley
Alternative Living Services	National assisted living comp	5/96	4.62	8/96	13.00	64	18	13	S	78	169	NatWest Securities
American Medserve	Provider of pharmacy services	9/96	9.10	11/96	15.00	39	23	60	S	80	173	William Blair
American Residential Services	Residential services	4/96	10.80	9/96	15.00	28	17	124	O	63	127	Smith Barney
Applied Analytical Industries	Pharmaceutical products	4/96	8.35	9/96	16.00	48	23	39	O	43	254	Goldman, Sachs
Biosite Diagnostics	Mfg diagnostic products	9/96	5.50	2/97	12.00	54	21	27	O	29	148	Cowen & Co.
Cal-Maine Foods	Mfg egg products	10/96	4.33	12/96	7.00	38	49	292	O	15	82	Paulson Investment
Catalyst	Warehouse mngt software systems	7/95	10.00	11/95	13.00	23	(1)	18	O	34	106	Robertson, Stephens
CB Commercial Real Estate	Commercial real estate services	9/96	10.00	11/96	20.00	50	(107)	534	O	87	265	Merrill Lynch
Cost Plus	Home living, entertainment products	11/95	11.31	4/96	15.00	25	36	183	O	42	121	Alex. Brown
DAOU Systems	Computer network sys. for hospitals	11/96	4.28	2/97	9.00	52	1	19	O	18	92	Alex. Brown
Data Processing Resources	Provides info tech staffing services	1/96	9.00	3/96	14.00	36	(2)	54	O	37	98	Montgomery
Deltek Systems	Develops integrated bus software	9/96	4.00	2/97	11.00	64	11	35	S	32	186	Montgomery
Diamond Home Services	Home improvement products	6/96	13.00	9/96	29.00	55	32	140	O	22	263	William Blair
Document Sciences	Document automation software	7/96	10.00	9/96	12.00	17	1	13	O	28	12	Deutsche Morgan
Dunn Computer	Custom computer systems	1/97	4.15	4/97	5.00	17	2	17	O	5	25	Network 1 Financial
E*TRADE	Online discount brokerage services	3/96	2.33	8/96	10.50	78	22	43	O	59	309	Robertson, Stephens
Essex	Dev electrical wire and cable products	12/96	10.00	4/97	17.00	41	146	1,332	S	98	491	Goldman, Sachs
Factory Card Outlet	Party supplies, greeting cards	7/96	3.30	12/96	9.00	63	26	103	O	24	60	Alex. Brown
Firearms Training Systems	Simulation systems for arms training	9/96	3.25	11/96	14.00	77	(87)	77	S	84	286	Montgomery
Forrester Research	Independent research firm	9/96	13.00	11/96	16.00	19	4	22	O	32	128	Goldman, Sachs
Gateway Data Sciences	Develops software products	10/95	5.09	3/96	6.75	25	(2)	26	O	8	19	National Securities
Hambrecht & Quist Group	Investment banking	3/96	6.52	8/96	16.00	59	170	396	S	56	355	Hambrecht & Quist
Hamilton Bancorp	Global trade finance	11/96	9.23	3/97	15.50	40	40	25	O	37	147	Oppenheimer
Hibbett Sporting Goods	Full-line sporting goods store	8/96	8.48	10/96	16.00	47	(7)	77	O	32	93	Smith Barney
HomeSide	Residential mortgage banking	11/96	10.29	1/97	15.00	31	388	262	S	110	634	Merrill Lynch
Hot Topic	Music licensed, influenced apparel	6/96	8.80	9/96	18.00	51	297	31	O	23	79	Montgomery
Impath	Provides information on cancer	10/95	9.50	2/96	13.00	27	6	14	O	25	64	Salomon Brothers
Infinity Financial Technology	Develops financial software	8/96	10.50	10/96	16.00	34	8	31	S	43	288	Goldman, Sachs
INS	Complex enterprise network svcs	6/96	8.00	9/96	16.00	50	(3)	44	O	40	495	Morgan Stanley
Intelligroup	Info tech services	6/96	8.00	9/96	10.00	20	(2)	35	O	25	107	Cowen & Co.

Company	Principal Business	Transaction Date	Transaction Price	Public Offering Date	Public Offering Price	% Discount[1] From Public Offering Price	Prior to[2] Offering (Millions) Equity	Prior to[2] Offering (Millions) Sales	Type[3]	Total IPO Offer (Millions)	Market Cap. (Millions)	Lead Underwriter
Intevac	Static sputtering systems	6/95	2.18	11/95	6.00	64	13	33	O	12	72	Robertson, Stephens
Isocor	Dev elec info exch software	1/96	8.00	3/96	9.00	11	12	17	O	18	76	Hambrecht & Quist
JDA Software Group	Software for retail orgs	11/95	5.25	3/96	13.00	60	(5)	30	O	35	158	Hambrecht & Quist
Kentek Information Systems	Supplier of laser printers	2/96	6.49	4/96	8.00	19	30	68	O	20	55	Janney Montgomery
Kitty Hawk	Air freight charter services	6/96	8.62	10/96	12.00	28	23	142	O	36	125	Smith Barney
Lumisys	Laser-based film digitizers	8/95	6.00	11/95	8.00	25	(4)	15	O	20	50	Hambrecht & Quist
Meta Group	Market assessment company	8/95	6.13	12/95	18.00	66	(4)	27	S	43	92	Robertson, Stephens
Metzler Group	Consulting services	6/96	12.00	10/96	16.00	25	3	19	O	56	165	Donaldson, Lufkin
Millennium Pharmaceuticals	Genomics industry	4/96	6.00	5/96	12.00	50	13	23	O	54	274	Goldman, Sachs
MIM Corporation	Pharmacy mgmt organization	5/96	7.50	8/96	13.00	42	(11)	278	O	52	156	Paine Webber
Molecular Devices	Mfgs bioanalytical measurement systems	9/95	5.25	12/95	11.00	52	6	25	O	25	95	UBS Securities
NCS HealthCare	Ind. provider of pharmacy services	9/95	10.06	2/96	16.50	39	12	87	S	70	190	Smith Barney
Northwest Pipe Company	Mfg welded steel pipe	8/95	4.78	11/95	9.00	47	15	96	O	15	45	Hanifen, Imhoff
NuCo$_2$	Supplies liquid carbon dioxide	7/95	4.40	12/95	9.00	51	1	7	O	20	48	Raymond James
ONSALE	Sell computers via Internet	12/96	5.00	4/97	6.00	17	2	14	S	15	98	Montgomery
OrCAD	Develops software products	12/95	7.88	2/96	11.00	28	6	14	O	35	67	Wessels, Arnold
Overland Data	Magnetic tape data storage sys	9/96	3.66	2/97	10.00	63	7	51	O	30	99	Jeffries & Co.
PIA Merchandising Services	Routed merchandising systems	12/95	9.81	2/96	14.00	30	6	105	O	33	76	Paine Webber
Pixar Animation Studios	Digital Animation Studio	10/95	9.60	11/95	22.00	56	4	12	O	132	823	Robertson, Stephens
Planet Hollywood	Theme restaurants	3/96	14.00	4/96	18.00	22	31	296	O	194	1914	Bear, Stearns
PowerCerv	Client/server development tools	11/95	4.00	3/96	14.00	71	(16)	28	S	46	186	Robertson, Stephens
Printware	Designs computer plates	4/96	3.00	7/96	6.00	50	5	8	O	10	29	RJ Steichen
Procom Technology	Provider of CD-ROM servers	7/96	5.17	12/96	9.00	43	7	83	O	27	99	Montgomery
Q.E.P.	Mfg. specialty tools	6/96	7.23	9/96	8.50	15	4	27	O	10	21	Cruttenden Roth
Qualix Group	Software for UNIX and Windows NT	10/96	5.62	2/97	8.00	30	4	25	O	24	81	Hambrecht & Quist
Raster Graphics	Large format color printing systems	5/96	7.00	8/96	8.00	13	8	33	O	24	67	Hambrecht & Quist
Renal Care Group	Nephrology services	1/96	7.50	2/96	18.00	58	20	71	O	70	157	Equitable Securities
Restrac	Dev human resource staffing software	4/96	4.67	7/96	11.00	58	3	19	O	28	87	Montgomery
RMH Teleservices	Outbound teleservices	5/96	1.91	9/96	12.50	85	(17)	31	S	35	96	Smith Barney
RockShox	Mfg bicycle suspension products	5/96	4.69	9/96	15.00	69	(38)	86	O	72	204	Merrill Lynch
Rogue Wave Software	Prvdr of sftwr parts, related tools	6/96	6.75	11/96	12.00	44	1	19	O	29	91	Hambrecht & Quist
SCB Computer Technology	Information technology services	10/95	9.75	2/96	15.50	37	3	40	S	34	106	Morgan Keegan
SeaChange International	Digital video products	6/96	7.33	11/96	15.00	51	1	36	O	30	191	Morgan Stanley
Segue Software	Dev software for automated testing	12/95	9.00	3/96	18.00	50	1	8	O	50	108	Alex. Brown
Signature Resorts	Developer, operator of timeshare resorts	6/96	12.00	8/96	14.00	14	48	79	O	74	232	Montgomery
SkyMall	In-flight catalogue company	9/96	5.56	12/96	8.00	31	(14)	40	O	16	69	Josephthal Lyon
Smart Modular Technologies	Mfg memory modules, PC card	8/95	7.00	11/95	12.00	42	21	237	O	36	212	Donaldson, Lufkin
Specialty Care Network	Physician practice mgmt co.	10/96	3.00	2/97	8.00	63	11	34	S	26	112	Credit Suisse
Sykes Enterprises	Info technology support systems	12/95	7.50	4/96	18.00	58	10	63	O	59	224	Robert W. Baird

Company	Principal Business	Transaction Date	Transaction Price	Public Offering Date	Public Offering Price	% Discount[1] From Public Offering Price	Prior to[2] Offering (Millions) Equity	Prior to Offering (Millions) Sales	Type[3]	Total IPO Offer (Millions)	Market Cap. (Millions)	Lead Underwriter
Synthetic Industries	Mfg polypropylene products	5/96	10.72	11/96	13.00	18	61	289	O	33	108	Bear, Stearns
Template Software	Provides software solutions	9/96	6.00	1/97	16.00	63	10	14	O	34	68	Volpe, Welty
The O'Gara Company	Armor provider for vehicles	8/96	6.11	11/96	9.00	32	4	62	S	18	60	Dillon, Read
The Registry	Provides info tech. consultants	3/96	11.00	6/96	17.00	35	2	131	O	37	168	Adams, Harkness
Titanium Metals	Titanium sponge and mill products	3/96	16.13	6/96	23.00	30	140	251	S	334	723	Salomon Brothers
Trex Medical	Mfg mammography equipment	2/96	10.75	6/96	14.00	23	63	134	O	35	358	NatWest Securities
Trident	Mfg impulse ink jet subsystems	9/95	12.00	2/96	16.00	25	(2)	20	O	48	111	Prudential Securities
Trusted Information Systems	Security solutions for computers	8/96	7.04	10/96	13.00	46	5	19	O	44	142	J.P. Morgan
United Natural Foods	Distributes natural foods	7/96	9.64	11/96	13.50	29	18	381	O	39	167	Smith Barney
USCS International	Provider of customer mgmt software	4/96	12.50	6/96	17.00	26	49	237	O	82	378	Merrill Lynch
Versatility	Provider of client/server software	9/96	10.50	12/96	15.00	30	2	21	O	33	108	Merrill Lynch
ViaSat	Digital satellite telecomm	7/96	4.09	12/96	9.00	55	6	36	O	20	68	Oppenheimer
VitalCom	Communication networks	10/95	5.72	2/96	12.50	54	7	24	S	25	95	Wessels, Arnold
Vivid Technologies	Mfg automated inspection systems	7/96	3.00	12/96	12.00	75	0	16	S	24	107	Lehman Brothers
Workgroup Technology	Develops software solutions	11/95	3.90	3/96	15.00	74	(4)	9	S	53	111	Alex. Brown
Xionics Document Technologies	Technology for office devices	5/96	4.50	9/96	12.00	63	(7)	24	S	36	121	Adams, Harkness
XLConnect Solutions	Professional services for computing	9/96	9.35	10/96	15.00	38	6	95	O	44	243	Alex. Brown
Xylan	High-bandwidth switching systems	12/95	5.25	3/96	26.00	80	16	30	S	109	1025	Morgan Stanley

(1) 1 minus (transaction price divided by offering price)
(2) As close to transaction as data available
(3) All options granted were stated to be at the common stock's fair market value or reasonably should have been

( ) Negative
O Option Transaction
S Sale Transaction

		% Discount	Equity	Sales	Total IPO Offer	Market Cap.
Total Transactions	Mean	43%	$19	$94	$47	$198
	Median	42%	$6	$35	$35	$112
	Count	91				

		% Discount	Equity	Sales	Total IPO Offer	Market Cap.
Sale Transactions	Mean	54%	$38	$131	$66	$259
	Median	61%	$8	$32	$45	$171
	Count	22				

		% Discount	Equity	Sales	Total IPO Offer	Market Cap.
Option Transactions	Mean	39%	$13	$82	$40	$178
	Median	40%	$6	$36	$33	$108
	Count	69				

DISCOUNTS FOR LACK OF MARKETABILITY
ARISING FROM SALES TRANSACTIONS

Eighth Robert W. Baird & Co. Incorporated Study
Fair Market Value Transactions Which Occurred Within Five Months Prior to an Initial Public Offering as Disclosed in the Prospectus

18 Months November 1995 through April 1997

Company	Principal Business	Transaction Date	Transaction Price	Public Offering Date	Public Offering Price	% Discount[1] From Public Offering Price	Prior to Offering[2] (Millions) Equity	Prior to Offering[2] (Millions) Sales	Type[3]	Lead Underwriter	Size of Transaction in Shares	Description of Transaction
Alternative Living Services	National assisted living comp	5/96	$4.62	8/96	$13.00	64	$18	$13	S	NatWest Securities	2,007,049	Issued to purchase a Co.
American Medserve	Provider of pharmacy services	9/96	9.10	11/96	15.00	39	23	60	S	William Blair	310,208	Sold to Directors
Deltek Systems	Develops integrated bus software	9/96	4.00	2/97	11.00	64	11	35	S	Montgomery	102,000	Exchanged for a business
Essex	Dev electrical wire and cable products	12/96	10.00	4/97	17.00	41	146	1,332	S	Goldman, Sachs	437,709	Sold to management
Firearms Training Systems	Simulation systems for arms training	9/96	3.25	11/96	14.00	77	(87)	77	S	Montgomery	232,333	Sold to management
Hambrecht & Quist Group	Investment banking	3/96	6.52	8/96	16.00	59	170	396	S	Hambrecht & Quist	169,428	Redemption from President
HomeSide	Residential mortgage banking	11/96	10.29	1/97	15.00	31	388	262	S	Merrill Lynch	11,461,400	Partial payment for Co.
Infinity Financial Technology	Develops financial software	8/96	10.50	10/96	16.00	34	8	31	S	Goldman, Sachs	9,524	Sold to Director
Meta Group	Market assessment company	8/95	6.13	12/95	18.00	66	(4)	27	S	Robertson, Stephens	339,368	Purchase by investors
NCS HealthCare	Ind. provider of pharmacy services	9/95	10.06	2/96	16.50	39	12	87	S	Smith Barney	787,773	Purchase of companies
ONSALE	Sell computers via Internet	12/96	5.00	4/97	6.00	17	2	14	S	Montgomery	20,000	Sold to a Director
PowerCerv	Client/server development tools	11/95	4.00	3/96	14.00	71	(16)	28	S	Robertson, Stephens	230,000	Consideration for Co. sale
RMH Teleservices	Outbound teleservices	5/96	1.91	9/96	12.50	85	(17)	31	S	Smith Barney	2,000,000	Purchase by investors
SCB Computer Technology	Information technology services	10/95	9.75	2/96	15.50	37	3	40	S	Morgan Keegan	125,948	Granted to employees
Specialty Care Network	Physician practice mgmt co.	10/96	3.00	2/97	8.00	63	11	34	S	Credit Suisse	100,000	Sold to Director
The O'Gara Company	Armor provider for vehicles	8/96	6.11	11/96	9.00	32	4	62	S	Dillon, Read	2,730	Sale of shares
Titanium Metals	Titanium sponge and mill products	3/96	16.13	6/96	23.00	30	140	251	S	Salomon Brothers	93,000	Granted to employees
VitalCom	Communication networks	10/95	5.72	2/96	12.50	54	7	24	S	Wessels, Arnold	34,965	Sold to President
Vivid Technologies	Mfg automated inspection systems	7/96	3.00	12/96	12.00	75	0	16	S	Lehman Brothers	15,000	Issued in lieu of fees
Workgroup Technology	Develops software solutions	11/95	3.90	3/96	15.00	74	(4)	9	S	Alex. Brown	666,666	Purchase by investor
Xionics Document Technologies	Technology for office devices	5/96	4.50	9/96	12.00	63	(7)	24	S	Adams, Harkness	1,000,000	Redemption from investor
Xylan	High-bandwidth switching systems	12/95	5.25	3/96	26.00	80	16	30	S	Morgan Stanley	952,382	Purchased by investors

	% Discount	Equity	Sales
Mean	54	38	131
Median	61	8	32
Count	22		

(1) 1 minus (transaction price divided by offering price)
(2) As close to transaction as data available
(3) All options granted were stated to be at the common stock's fair market value or reasonably should have been

( ) Negative
S Sale Transaction