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.
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%.

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%.
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.

### Option Transactions

<table>
<thead>
<tr>
<th>Study</th>
<th># of Transactions</th>
<th>Mean Discount</th>
<th>Median Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995 – 1997</td>
<td>69</td>
<td>39%</td>
<td>40%</td>
</tr>
<tr>
<td>1994 – 1995</td>
<td>33</td>
<td>44%</td>
<td>43%</td>
</tr>
<tr>
<td>1992 – 1993</td>
<td>46</td>
<td>45%</td>
<td>44%</td>
</tr>
<tr>
<td>All 8 Studies</td>
<td>239</td>
<td>43%</td>
<td>43%</td>
</tr>
</tbody>
</table>
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


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


John D. Emory, ASA, is First Vice President, Appraisal Services, Robert W. Baird & Co., Incorporated, an affiliate of Northwestern Mutual Life Insurance Company. He served for the allowed six years on the American Society of Appraisers Business Valuation Committee. He is a past President of the Wisconsin Chapter of the ASA, a member of the ESOP Association Valuation Advisory Committee and has been Chairman of its Discount for Lack of Marketability Subcommittee. Assistance was provided by F.R. Dengel, Baird Associate and by Alan P. English.
### 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

<table>
<thead>
<tr>
<th>Company</th>
<th>Principal Business</th>
<th>Transaction Date</th>
<th>Public Offering Date</th>
<th>% Discount(^a) From Public Offering Price</th>
<th>Prior to (^b) Offering (Millions)</th>
<th>Total IPO Offer (Millions)</th>
<th>Market Cap. (Millions)</th>
<th>Lead Underwriter</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 Cent Only Stores</td>
<td>Deep-discount retailer</td>
<td>5/96</td>
<td>5/96</td>
<td>24</td>
<td>$2</td>
<td>$62</td>
<td>$206</td>
<td>EVEREN Securities</td>
</tr>
<tr>
<td>Aavid Thermal Technologies</td>
<td>Provider of thermal mngt products</td>
<td>1/96</td>
<td>1/96</td>
<td>9.5</td>
<td>4</td>
<td>87</td>
<td>22</td>
<td>Montgomery</td>
</tr>
<tr>
<td>Abacus Direct</td>
<td>Marketing research services</td>
<td>5/96</td>
<td>9/96</td>
<td>70</td>
<td>2</td>
<td>12</td>
<td>71</td>
<td>133</td>
</tr>
<tr>
<td>Advanced Fibre Communications</td>
<td>Mfg digital loop carrier system</td>
<td>6/96</td>
<td>9/96</td>
<td>50</td>
<td>(8)</td>
<td>89</td>
<td>113</td>
<td>732</td>
</tr>
<tr>
<td>Alternative Living Services</td>
<td>National assisted living comp</td>
<td>5/96</td>
<td>8/96</td>
<td>64</td>
<td>18</td>
<td>13</td>
<td>78</td>
<td>NatWest Securities</td>
</tr>
<tr>
<td>American Medserve</td>
<td>Provider of pharmacy services</td>
<td>9/96</td>
<td>11/96</td>
<td>39</td>
<td>23</td>
<td>60</td>
<td>80</td>
<td>William Blair</td>
</tr>
<tr>
<td>American Residential Services</td>
<td>Residential services</td>
<td>4/96</td>
<td>9/15</td>
<td>28</td>
<td>17</td>
<td>124</td>
<td>63</td>
<td>Smith Barney</td>
</tr>
<tr>
<td>Applied Analytical Industries</td>
<td>Pharmaceutical products</td>
<td>4/96</td>
<td>9/16</td>
<td>48</td>
<td>23</td>
<td>39</td>
<td>43</td>
<td>254</td>
</tr>
<tr>
<td>Biosite Diagnostics</td>
<td>Mfg diagnostic products</td>
<td>9/96</td>
<td>2/97</td>
<td>54</td>
<td>21</td>
<td>27</td>
<td>29</td>
<td>148</td>
</tr>
<tr>
<td>Cal-Maine Foods</td>
<td>Mfg egg products</td>
<td>10/96</td>
<td>11/96</td>
<td>7.0</td>
<td>38</td>
<td>292</td>
<td>15</td>
<td>82</td>
</tr>
<tr>
<td>Catalyst</td>
<td>Warehouse mngt software systems</td>
<td>7/95</td>
<td>11/95</td>
<td>23</td>
<td>(1)</td>
<td>18</td>
<td>34</td>
<td>106</td>
</tr>
<tr>
<td>CB Commercial Real Estate</td>
<td>Commercial real estate services</td>
<td>9/96</td>
<td>11/96</td>
<td>50</td>
<td>(107)</td>
<td>534</td>
<td>87</td>
<td>Merrill Lynch</td>
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<tr>
<td>Cost Plus</td>
<td>Home living, entertainment products</td>
<td>11/95</td>
<td>4/96</td>
<td>25</td>
<td>36</td>
<td>183</td>
<td>42</td>
<td>121</td>
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<tr>
<td>DAOU Systems</td>
<td>Computer network sys. for hospitals</td>
<td>11/96</td>
<td>2/97</td>
<td>52</td>
<td>1</td>
<td>19</td>
<td>18</td>
<td>92</td>
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<tr>
<td>Data Processing Resources</td>
<td>Provides info tech staffing services</td>
<td>1/96</td>
<td>3/96</td>
<td>36</td>
<td>2</td>
<td>54</td>
<td>37</td>
<td>Montgomery</td>
</tr>
<tr>
<td>Deltek Systems</td>
<td>Develops integrated bus software</td>
<td>9/96</td>
<td>2/97</td>
<td>64</td>
<td>11</td>
<td>35</td>
<td>32</td>
<td>186</td>
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<tr>
<td>Diamond Home Services</td>
<td>Home improvement products</td>
<td>6/96</td>
<td>9/96</td>
<td>55</td>
<td>32</td>
<td>140</td>
<td>22</td>
<td>263</td>
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<tr>
<td>Document Sciences</td>
<td>Document automation software</td>
<td>7/96</td>
<td>9/96</td>
<td>17</td>
<td>1</td>
<td>13</td>
<td>28</td>
<td>12</td>
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<tr>
<td>Dunn Computer</td>
<td>Custom computer systems</td>
<td>1/97</td>
<td>4/97</td>
<td>5.0</td>
<td>2</td>
<td>17</td>
<td>5</td>
<td>25</td>
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<td>E*TRADE</td>
<td>Online discount brokerage services</td>
<td>3/96</td>
<td>8/96</td>
<td>78</td>
<td>22</td>
<td>43</td>
<td>59</td>
<td>309</td>
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<tr>
<td>Essex</td>
<td>Dev electrical wire and cable products</td>
<td>12/96</td>
<td>4/97</td>
<td>41</td>
<td>146</td>
<td>1,332</td>
<td>98</td>
<td>491</td>
</tr>
<tr>
<td>Factory Card Outlet</td>
<td>Party supplies, greeting cards</td>
<td>7/96</td>
<td>12/96</td>
<td>63</td>
<td>26</td>
<td>103</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>Firearms Training Systems</td>
<td>Simulation systems for arms training</td>
<td>9/96</td>
<td>11/96</td>
<td>77</td>
<td>(87)</td>
<td>77</td>
<td>84</td>
<td>286</td>
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<tr>
<td>Forrester Research</td>
<td>Independent research firm</td>
<td>9/96</td>
<td>11/96</td>
<td>19</td>
<td>4</td>
<td>22</td>
<td>32</td>
<td>128</td>
</tr>
<tr>
<td>Gateway Data Sciences</td>
<td>Develops software products</td>
<td>10/95</td>
<td>3/96</td>
<td>25</td>
<td>(2)</td>
<td>26</td>
<td>8</td>
<td>19</td>
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<tr>
<td>Hambrecht &amp; Quist Group</td>
<td>Investment banking</td>
<td>3/96</td>
<td>8/96</td>
<td>59</td>
<td>170</td>
<td>396</td>
<td>56</td>
<td>355</td>
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<tr>
<td>Hamilton Bancorp</td>
<td>Global trade finance</td>
<td>11/96</td>
<td>3/97</td>
<td>40</td>
<td>40</td>
<td>25</td>
<td>37</td>
<td>147</td>
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<tr>
<td>Hibbett Sporting Goods</td>
<td>Full-line sporting goods store</td>
<td>8/96</td>
<td>10/96</td>
<td>47</td>
<td>(7)</td>
<td>77</td>
<td>32</td>
<td>93</td>
</tr>
<tr>
<td>HomeSide</td>
<td>Residential mortgage banking</td>
<td>11/96</td>
<td>1/97</td>
<td>31</td>
<td>388</td>
<td>262</td>
<td>110</td>
<td>634</td>
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<tr>
<td>Hot Topic</td>
<td>Music licensed, influenced apparel</td>
<td>6/96</td>
<td>9/96</td>
<td>51</td>
<td>297</td>
<td>31</td>
<td>23</td>
<td>79</td>
</tr>
<tr>
<td>Impath</td>
<td>Provides information on cancer</td>
<td>10/95</td>
<td>2/96</td>
<td>27</td>
<td>6</td>
<td>14</td>
<td>25</td>
<td>64</td>
</tr>
<tr>
<td>Infinity Financial Technology</td>
<td>Develops financial software</td>
<td>8/96</td>
<td>10/6</td>
<td>34</td>
<td>8</td>
<td>31</td>
<td>43</td>
<td>288</td>
</tr>
<tr>
<td>INS</td>
<td>Complex enterprise network svcs</td>
<td>6/96</td>
<td>9/96</td>
<td>50</td>
<td>(3)</td>
<td>44</td>
<td>40</td>
<td>495</td>
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<tr>
<td>Intelligroup</td>
<td>Info tech services</td>
<td>6/96</td>
<td>9/96</td>
<td>20</td>
<td>(2)</td>
<td>35</td>
<td>25</td>
<td>107</td>
</tr>
<tr>
<td>Company</td>
<td>Principal Business</td>
<td>Transaction Date</td>
<td>Public Offering Date</td>
<td>% Discount From Public Offering Price</td>
<td>Prior to IPO Offering Price</td>
<td>Total IPO Offer Price (Millions)</td>
<td>Market Cap. (Millions)</td>
<td>Lead Underwriter</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------------------------</td>
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<td>-------------------------</td>
</tr>
<tr>
<td>Intevac</td>
<td>Static sputtering systems</td>
<td>6/95</td>
<td>11/95</td>
<td>60</td>
<td>(5)</td>
<td>12</td>
<td>72</td>
<td>Robertson, Stephens</td>
</tr>
<tr>
<td>Isocor</td>
<td>Dev elec info exch software</td>
<td>1/96</td>
<td>3/96</td>
<td>11</td>
<td>12</td>
<td>17</td>
<td>86</td>
<td>Hambrecht &amp; Quist</td>
</tr>
<tr>
<td>JDA Software Group</td>
<td>Software for retail orgs</td>
<td>11/95</td>
<td>3/96</td>
<td>60</td>
<td>(5)</td>
<td>30</td>
<td>158</td>
<td>Hambrecht &amp; Quist</td>
</tr>
<tr>
<td>Kentek Information Systems</td>
<td>Supplier of laser printers</td>
<td>2/96</td>
<td>4/96</td>
<td>19</td>
<td>30</td>
<td>68</td>
<td>55</td>
<td>Janney Montgomery</td>
</tr>
<tr>
<td>Kitty Hawk</td>
<td>Air freight charter services</td>
<td>6/96</td>
<td>10/96</td>
<td>28</td>
<td>23</td>
<td>142</td>
<td>125</td>
<td>Smith Barney</td>
</tr>
<tr>
<td>Lumisys</td>
<td>Laser-based film digitizers</td>
<td>8/95</td>
<td>11/95</td>
<td>25</td>
<td>(4)</td>
<td>15</td>
<td>50</td>
<td>Hambrecht &amp; Quist</td>
</tr>
<tr>
<td>Meta Group</td>
<td>Market assessment company</td>
<td>8/95</td>
<td>12/95</td>
<td>66</td>
<td>(4)</td>
<td>27</td>
<td>43</td>
<td>Robertson, Stephens</td>
</tr>
<tr>
<td>Metzler Group</td>
<td>Consulting services</td>
<td>6/96</td>
<td>10/96</td>
<td>25</td>
<td>3</td>
<td>19</td>
<td>56</td>
<td>Donaldson, Lufkin</td>
</tr>
<tr>
<td>Millennium Pharmaceuticals</td>
<td>Genomics industry</td>
<td>4/96</td>
<td>5/96</td>
<td>50</td>
<td>13</td>
<td>23</td>
<td>54</td>
<td>Goldman, Sachs</td>
</tr>
<tr>
<td>MIM Corporation</td>
<td>Pharmacy mgmt organization</td>
<td>5/96</td>
<td>8/96</td>
<td>42</td>
<td>(11)</td>
<td>278</td>
<td>52</td>
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<td>Ind. provider of pharmacy services</td>
<td>9/95</td>
<td>2/96</td>
<td>39</td>
<td>12</td>
<td>87</td>
<td>70</td>
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<td>Mfg welded steel pipe</td>
<td>8/95</td>
<td>11/95</td>
<td>47</td>
<td>15</td>
<td>96</td>
<td>15</td>
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<td>Supplies liquid carbon dioxide</td>
<td>7/95</td>
<td>12/95</td>
<td>51</td>
<td>1</td>
<td>7</td>
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<td>Raymond James</td>
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<td>Sell computers via Internet</td>
<td>12/95</td>
<td>4/97</td>
<td>17</td>
<td>2</td>
<td>14</td>
<td>15</td>
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<td>Develops software products</td>
<td>12/95</td>
<td>2/96</td>
<td>28</td>
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<td>Magnetic tape data storage sys</td>
<td>9/96</td>
<td>2/97</td>
<td>63</td>
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<td>Digital Animation Studio</td>
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<td>11/95</td>
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<td>12</td>
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<td>Theme restaurants</td>
<td>3/96</td>
<td>4/97</td>
<td>22</td>
<td>31</td>
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<td>11/95</td>
<td>3/96</td>
<td>71</td>
<td>(16)</td>
<td>28</td>
<td>46</td>
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<td>Printware</td>
<td>Designs computer plates</td>
<td>4/96</td>
<td>7/96</td>
<td>50</td>
<td>5</td>
<td>8</td>
<td>10</td>
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<td>7/96</td>
<td>12/96</td>
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<td>83</td>
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<td>6/96</td>
<td>9/96</td>
<td>15</td>
<td>4</td>
<td>27</td>
<td>10</td>
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<td>Software for UNIX and Windows NT</td>
<td>10/96</td>
<td>2/97</td>
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<td>Large format color printing systems</td>
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<td>8/96</td>
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<td>Nephrology services</td>
<td>1/96</td>
<td>2/96</td>
<td>58</td>
<td>20</td>
<td>71</td>
<td>70</td>
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<td>Dev human resource staffing software</td>
<td>4/96</td>
<td>7/96</td>
<td>58</td>
<td>3</td>
<td>19</td>
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<td>RMH Teleservices</td>
<td>Outbound teleservices</td>
<td>5/96</td>
<td>9/96</td>
<td>85</td>
<td>(17)</td>
<td>31</td>
<td>35</td>
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<td>Mfg bicycle suspension products</td>
<td>5/96</td>
<td>9/96</td>
<td>69</td>
<td>(38)</td>
<td>86</td>
<td>72</td>
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<td>Prvdr of sftwr parts, related tools</td>
<td>6/96</td>
<td>11/96</td>
<td>44</td>
<td>1</td>
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<td>2/96</td>
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<td>11/96</td>
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<td>(17)</td>
<td>31</td>
<td>35</td>
<td>Smith Barney</td>
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<td>Segue Software</td>
<td>Dev software for automated testing</td>
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<td>3/96</td>
<td>50</td>
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<td>Alex, Brown</td>
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<td>Signature Resorts</td>
<td>Developer, operator of timeshare resorts</td>
<td>6/96</td>
<td>8/96</td>
<td>14</td>
<td>48</td>
<td>79</td>
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<td>SkyMall</td>
<td>In-flight catalogue company</td>
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<td>12/96</td>
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<td>40</td>
<td>16</td>
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<td>Mfg memory modules, PC card</td>
<td>8/95</td>
<td>11/95</td>
<td>42</td>
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<td>237</td>
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<td>2/97</td>
<td>63</td>
<td>11</td>
<td>34</td>
<td>26</td>
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<td>Sykes Enterprises</td>
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<td>12/95</td>
<td>4/96</td>
<td>58</td>
<td>10</td>
<td>63</td>
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<td>Robert W. Baird</td>
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<td>Company</td>
<td>Principal Business</td>
<td>Transaction Date</td>
<td>Public Offering Date</td>
<td>% Discount From Public Offering</td>
<td>Prior to Offering Equity</td>
<td>Sales Type</td>
<td>Total IPO Offer (Millions)</td>
<td>Market Cap. (Millions)</td>
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<td>Mfg polypropylene products</td>
<td>5/96</td>
<td>10.72</td>
<td>11/96 13.00</td>
<td>18</td>
<td>O</td>
<td>33</td>
<td>108</td>
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<tr>
<td>Template Software</td>
<td>Provides software solutions</td>
<td>9/96</td>
<td>6.00</td>
<td>1/97 16.00</td>
<td>63</td>
<td>O</td>
<td>34</td>
<td>68</td>
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<td>The O’Gara Company</td>
<td>Armor provider for vehicles</td>
<td>8/96</td>
<td>6.11</td>
<td>11/96 9.00</td>
<td>32</td>
<td>S</td>
<td>18</td>
<td>60</td>
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<td>Provides info tech. consultants</td>
<td>3/96</td>
<td>11.00</td>
<td>6/96 17.00</td>
<td>35</td>
<td>O</td>
<td>37</td>
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<td>3/96</td>
<td>16.13</td>
<td>6/96 23.00</td>
<td>30</td>
<td>S</td>
<td>334</td>
<td>723</td>
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<td>Trex Medical</td>
<td>Mfg mammography equipment</td>
<td>2/96</td>
<td>10.75</td>
<td>6/96 14.00</td>
<td>23</td>
<td>O</td>
<td>35</td>
<td>358</td>
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<td>Trident</td>
<td>Mfg impulse ink jet subsystems</td>
<td>9/95</td>
<td>12.00</td>
<td>2/96 16.00</td>
<td>25</td>
<td>O</td>
<td>48</td>
<td>111</td>
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<tr>
<td>Trusted Information Systems</td>
<td>Security solutions for computers</td>
<td>8/96</td>
<td>7.04</td>
<td>10/96 13.00</td>
<td>46</td>
<td>O</td>
<td>44</td>
<td>142</td>
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<td>Distributes natural foods</td>
<td>7/96</td>
<td>9.64</td>
<td>11/96 13.50</td>
<td>29</td>
<td>O</td>
<td>39</td>
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<td>USCS International</td>
<td>Provider of customer mgmt software</td>
<td>4/96</td>
<td>12.50</td>
<td>6/96 17.00</td>
<td>26</td>
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<td>Provider of client/server software</td>
<td>9/96</td>
<td>10.50</td>
<td>12/96 15.00</td>
<td>30</td>
<td>O</td>
<td>33</td>
<td>108</td>
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<td>Digital satellite telecom</td>
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<td>4.09</td>
<td>12/96 9.00</td>
<td>55</td>
<td>S</td>
<td>25</td>
<td>95</td>
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<td>Communication networks</td>
<td>10/95</td>
<td>5.72</td>
<td>2/96 12.50</td>
<td>54</td>
<td>S</td>
<td>24</td>
<td>107</td>
</tr>
<tr>
<td>Vivid Technologies</td>
<td>Mfg automated inspection systems</td>
<td>7/96</td>
<td>3.00</td>
<td>12/96 12.00</td>
<td>75</td>
<td>S</td>
<td>24</td>
<td>107</td>
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<tr>
<td>Workgroup Technology</td>
<td>Develops software solutions</td>
<td>11/95</td>
<td>3.90</td>
<td>3/96 15.00</td>
<td>74</td>
<td>S</td>
<td>53</td>
<td>111</td>
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<tr>
<td>Xionics Document Technologies</td>
<td>Technology for office devices</td>
<td>5/96</td>
<td>4.50</td>
<td>9/96 12.00</td>
<td>63</td>
<td>O</td>
<td>36</td>
<td>121</td>
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<tr>
<td>XLConnect Solutions</td>
<td>Professional services for computing</td>
<td>9/96</td>
<td>9.35</td>
<td>10/96 15.00</td>
<td>38</td>
<td>O</td>
<td>44</td>
<td>243</td>
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<td>Xylan</td>
<td>High-bandwidth switching systems</td>
<td>12/95</td>
<td>5.25</td>
<td>3/96 26.00</td>
<td>80</td>
<td>O</td>
<td>109</td>
<td>1025</td>
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</table>

(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

<table>
<thead>
<tr>
<th>Total Transactions</th>
<th>Mean</th>
<th>Median</th>
<th>Count</th>
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<tr>
<td></td>
<td>43%</td>
<td>42%</td>
<td>91</td>
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<tr>
<td></td>
<td>$19</td>
<td>$94</td>
<td>$47</td>
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<table>
<thead>
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<th>Sale Transactions</th>
<th>Mean</th>
<th>Median</th>
<th>Count</th>
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<td></td>
<td>54%</td>
<td>61%</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>$38</td>
<td>$8</td>
<td>$66</td>
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<table>
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<th>Option Transactions</th>
<th>Mean</th>
<th>Median</th>
<th>Count</th>
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<td>39%</td>
<td>40%</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>$13</td>
<td>$6</td>
<td>$40</td>
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( ) Negative
O Option Transaction
S Sale Transaction
## 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

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

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

<table>
<thead>
<tr>
<th>Mean</th>
<th>Median</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>61</td>
<td>22</td>
</tr>
</tbody>
</table>

() Negative  
S Sale Transaction