Venture Capital Valuation: Case Studies and Methodology
By Lorenzo Carver

CHAPTER 5

"Enterprise Value" + "Allocation Methods" = Value Destruction

Undervaluing Companies and Overvaluing Employee Options

This is perhaps the most important chapter in this book because it gives any reader an opportunity to make money using the information that's about to be presented. How?

In the early chapters of this book, I made the following assertion: The terms "value" and "valuation" are used a lot for high-growth private companies and that's a bad thing. It's bad because when founders, VCs, angels, attorneys, CFOs, CEOs, and employees use these words and don't truly understand what they mean, those same people end up losing lots of money as a result.

If that assertion is true, which every case we've presented thus far supports, then there's an opportunity to realize a profit simply by recognizing verifiable errors in investment cash flow potential embedded in mechanically high- or low-value conclusions related to venture-funded companies.

MOST 409A VALUATIONS UNDERVALUE THE COMPANY AND SIMULTANEOUSLY OVERVALUE EMPLOYEE STOCK OPTIONS

Although we begin the discussion here with respect to employee options, all equity securities in venture-backed companies are essentially call options on an exit opportunity, as opposed to simply rights to future earnings per share. In the case of preferred stock, there are additional options embedded, including calls to roll over the position and related puts to protect prior purchases, through anti-dilution protection. If you can definitively identify

logical valuation errors for each of these securities' rights, including each round of preferred stock, common stock, warrants, and options, which we will do in the pages that follow, increased realized and unrealized gains can be achieved. As we look at the real-world cases of VC-funded companies, we are going to identify how different parties in these companies, and outside of these companies, pay the price or realize additional profits because of someone's lack of understanding concerning valuing venture backed company securities.

To that end, here's another assertion we will attempt to prove in this chapter with the cases that follow: "Most 409A valuations undervalue the venture-backed company and simultaneously overvalue the employee stock options." That may seem counterintuitive to many people and almost impossible to others. Many would say that, "if a VC funded company value represents a pie, and the employee stock options represent a piece of that pie, than the difference in value should be proportional." If that's true, than yes, it would appear that my assertion that most 409A valuations undervalue the venture-backed company and simultaneously overvalue the employee options would indeed seem at least not internally consistent. See Exhibit 5.1.

Many venture-capital investing partners would say that it's obvious that 409A valuations understate a company's true value. Some would say the 409A valuation really doesn't matter and, therefore, the prices at which the company is issuing its options don't really matter either, within reason. However, few would note that these differences have an impact on every investing partner's cash-on-cash return and, therefore, impact everyone in a transaction beyond the relatively small expenditure incurred to generate

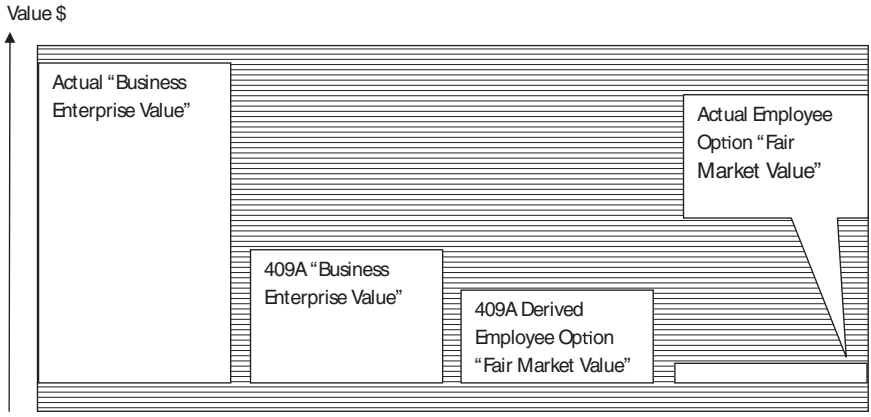


EXHIBIT 5.1 409A Valuations Overvalue Options and Undervalue Companies
Source: Liquid Scenarios, Inc.

these reports and their conclusions. But that is the case. Every investing partner's cash-on-cash return is impacted by how fairly employee options are priced.

So before we get into the details of exactly how 409A valuations typically undervalue companies and simultaneously overvalue employee stock options, please take a moment to assume the assertion is correct. If it is correct, who is making money as a result of overvalued employee stock options and who is losing money as a result? Well, in this case the biggest losers, in fact, would be key employees that have their options granted at a higher strike price than is truly fair as a result of a 409A valuation. As of the writing of this book, most employees can't determine if the strike price for their options are fair, but that's not a condition that's expected to exist in perpetuity, for reasons we'll discuss later.

Who's the second biggest loser of money, from a cash flow perspective, as a result of overpriced employee stock options? Ironically, it's the same organization that set the rules for 409A, the U.S. Department of Treasury. If options are being granted at a higher price than what is "fair," then when a company does realize a successful exit, all things being equal, the gain realized by employees on those options will be lower than it would have otherwise been if a fair price had been used. As a result, the U.S. Treasury actually ends up getting lower receipts due to how the venture-capital industry is attempting to comply with the provisions of 409A.

If you're wondering how that happened, it may be due in part to the fact that few if any of the parties that are most responsible for shaping how venture-backed common stock fair market value calculations are performed for tax purposes are tax professionals. Indeed, they aren't even the investing partners that comprise the primary market participants putting real cash on the line in transactions that drive changes in common stock value fair market value for VC-funded companies. VCs may decide, or more accurately "recommend," who performs the 409A valuations for the companies that they lead investments on, but they certainly don't do this with any objective other than helping their investees, partners on boards, employees, and prospective future acquirers avoid the substantial penalties that accompany being "grossly negligent" in performing those valuations. Instead, the parties that have had the most influence on the common stock value conclusions, from more than a review perspective, are the financial statement auditors.

DID AUDITORS DRIVE VALUATORS TO OVERVALUE EMPLOYEE STOCK OPTIONS?

The accounting rules for employee options, or stock-based compensation, require a value standard that you can't really get to without either

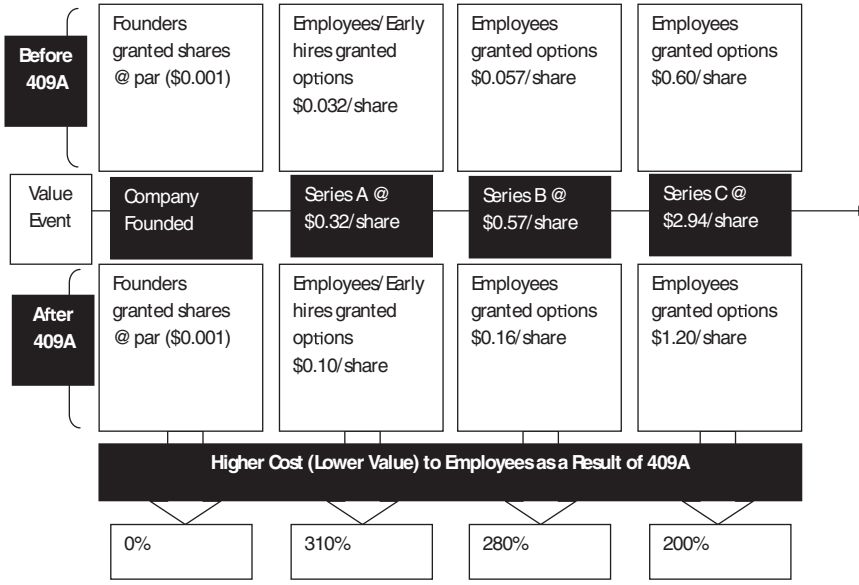


EXHIBIT 5.2 Options Undervalued before 409A and Overvalued after 409A
Source: Liquid Scenarios, Inc.

(a) observing a true market transaction or (b) coming up with an estimate of the market value and then applying some adjustments. Unfortunately for employees of the venture-backed companies, the parties that have paid most heavily for this reality are illustrated in Exhibit 5.2.

A highly successful entrepreneur and angel investor I know, who prefers to remain anonymous, told me, "I don't see why we can't just use 10% of the preferred price like we used to do. No one believes the 409A reports, almost no one even reads them and hardly anyone understands them." The term "fair value" has sometimes been defined, in part, as an unbiased and rational estimate of the potential market price. This definition supports the use of the "10% rule" employed by most venture-backed company boards when pricing employees' options at the early stages for many years before auditors and valuation professionals were heavily involved as a result of 409A. If a preferred financing event had occurred within a reasonable period of time, the boards would simply multiply that round's deemed issue price by 10%, or some comparable fraction (5%, 20%, etc.). The resulting product would be the price at which options were granted, and this was the estimated fair market value of the common stock.

This method, of course, is how we derived the "pre-409A" option grant values in the previous illustration, using 10% until the Series C, for which

we used 20%. It's important to note that this practice of simply applying a percentage to the preferred price could be considered a "bottom-up" approach to getting an idea of a security's value. This makes it consistent with how most VCs approach pricing preferred stock, indirectly, when making the investments that trigger nearly 80% to 90% of the changes in value any reporting investee or limited partner will record in a given year.

While on its surface this approach may seem questionable for 409A compliance and Topic 718 (FAS123R) financial reporting, it does in fact meet the test of being both rational and unbiased, especially in the cases of companies that have only issued one round of preferred financing (Series A for instance) within a reasonable window of time around which the options have been granted. Moreover, you could potentially argue that for those same companies, Series A rounds, seed deals, and so forth, it would also meet both the tax and auditing guidelines. We will explore this point at length a little later. The primary point for now is that while the more rigid analysis taking place for early-stage companies in response to 409A may also be generating "rational and unbiased" conclusions, those conclusions may not be fair to employees, who should be considered to one extent or another some of the "willing" buyers or "willing" sellers in these transactions.

Unfortunately, those same buyers and sellers, employees in the case of stock options, clearly don't have reasonable access to one of the requirements for "fair value" used in the definition that applies to venture fund transactions: "having a reasonable understanding about the asset or liability and the transaction based on all available information, including information that might be obtained through due diligence efforts."

If a venture investor told an LP its fund was paying 300% more for every investment in every portfolio company, across the board, in response to a tax regulation and auditor recommendations, what do you think the LPs of that venture fund would do? Their dissatisfaction with that strategy would probably be reflected in immediate attempts to sell their LP interests at a heavy discount to avoid future obligations (capital calls) to fund that investment approach.

One of the reasons you don't see venture-funded company hires, or their spouses, objecting to paying 300% more across the board for rights to purchase the same amount of shares is because of a lack of understanding concerning what they are receiving and how its "valuation" takes away from their earning potential. With the probability of a "grand-slam" rather small, few employees are going to bicker, assuming their cash compensation is comparable to their peers at other VC-backed, and non-venture-backed, companies. So, in some ways the differences between one exercise price and another may not appear meaningful to employees in general.

An analogy might be to the perceived difference between paying $150 in a "Mega Millions" lottery if someone picks 3 out of 5 numbers versus paying $50. Changing the payout from $150 to $50, without changing the probability of winning for getting 3 out of 5 numbers, is unlikely to impact lottery receipts materially. The name of the game is "Mega Millions" not "Mega Hundreds" and it's the prospect of "millions" that drives purchases of a lottery ticket.

MATCH 4 OUT OF 5 WHITE NUMBERS BUT NOT MATCH THE MEGA NUMBER (PAYOUT = $150)

The number of ways 4 of the 5 first numbers on your lottery ticket can match the 5 White numbers is COMBIN(5,4) = 5.

The number of ways your fifth initial number can match any of the 51 losing White numbers is COMBIN(51,1) = 51.

The number of ways your final number can match any of the 45 losing Mega numbers is: COMBIN(45,1) = 45.

The product of these is the number of ways you can win this configuration: COMBIN(5,4) × COMBIN(51,1) × COMBIN(45,1) = 11,475. The probability of success is thus: 11,475/175,711,536 = 0.0000653059000065 or "One chance in 15,312.55."

Source: Bill Butler's Durango Bill Website at www.durangobill.com.

However, hires for venture-funded companies, at all stages, tend to be extremely smart and driven. If the perception became that the options issued by venture-fund startups had a negative present value or negative expected value, while lottery tickets of course have both, stock options might cease to be an effective incentive for new hires. Similarly, VCs, unlike state lotteries, know experientially that it takes a highly motivated and smart management team to achieve a successful exit. As a result, the lack of understanding today (2009, 2010, 2011) regarding artificially higher option grant prices across the board is unlikely to persist indefinitely.

Much of the current lack of understanding is perpetuated by financial industry jargon and accounting pronouncements that are difficult for the auditors themselves to recite accurately without a copy of the rules close by. In this regard, being generally confused by the redundant and inconsistent use of the word "value," the employees are not alone. Venture-fund GPs, investing professionals, limited partner investment managers, and even the accounting firms that sign off on reports used by beneficiaries of these

sophisticated parties share that confusion, as we explain in detail later in this chapter. One key cause of this confusion is the use of the terms "market value," "current value," and "enterprise value" interchangeably. Similarly, the use of less-volatile securities, such as publicly traded technology stocks, as the primary source to estimate price and return dispersion for a class of investments that typically has substantially greater volatility is another cause of confusion.

MOST 409A ENTERPRISE VALUE CALCULATIONS IGNORE THE "TAKEOVER" VALUE OF PREFERRED

What's enterprise value? For a public company it's a rather easy calculation, since its equity (usually common stock) is quoted, its debt is on the balance sheet (or trades with a market value), and its cash position is also on the balance sheet and reported quarterly to an exchange as well as regulators, such as the SEC in the United States. So that's one way to explain how to calculate the enterprise value of a company. But it still doesn't speak to the insight a user is supposed to glean from the resulting output of an "enterprise value." One popular alternative description of "enterprise value" is "takeover value."

Takeover value, as the name more clearly suggests, is the estimated cost to buy (take over) a company. A very short version of this relationship is illustrated by the following equation:

$$\text{Equity Market Value} + \text{Debt Market Value} - \text{Cash} = \underset{\text{(Takeover Value?)}}{\text{Enterprise Value}}$$

It's worth quickly noting that this formula does not fit easily with most venture-backed companies. In the case of venture-financed companies, cash in the enterprise as of a valuation date is like a stack of chips in poker tournament. The bigger the stack, the more chances a company hits the jackpot for investors. But for publicly traded companies, and also for many private companies, you can in fact have too much cash, as in more cash than you need to carry on the operations of a company. Also, for many companies outside of venture capital, the cash on hand is assumed to be an asset that would, or at least could, be distributed to equity holders prior to an acquisition or used to pay down liabilities, for instance. For these reasons, and others, Wall Street analysts and Main Street valuation professionals have a variety of ways of adjusting enterprise values to reflect these realities. Those enterprise values, market values of equity, and market value of debt net of cash represent the cost of taking the company over.

In a publicly traded company, the true takeover value is a moving target. When the stock price changes so does the value of equity. As the value of equity changes, the implied amount required to gain control of the company (the control premium) changes. If an actual offer or rumor of an offer emerges, that control premium will begin to be reflected in the price of the stock. We touched upon this concept briefly in Chapter 1 when discussing control premiums derived from Mergerstat, for instance. You may recall from that chapter that the formula to translate a control premium into a minority discount was:

$$\text{Minority Discount} = 1 - [1/(1 + \text{Mean Premium Paid})]$$

It was also mentioned in Chapter 1 that this premium, which can sometimes be in excess of 50%, is not totally associated with control. In many cases, the premium would also reflect the strategic value of the acquisition. In the case of venture-backed companies that are acquired prior to achieving a clear path to recurring future earnings, or large and growing revenues, you might argue that the vast majority of those acquisitions are in fact strategic in nature. That's important in the context of a venture-backed company because it's that premium, indirectly, that alternative asset investors backing venture fund management teams expect to be pursued if a company does not go public. These same parties realize that not only will most of the companies invested in fail to even return 100% of their capital, but they also know that most of the funds they invest in won't invest 100% of their capital. But one Google, Zynga, LinkedIn, Microsoft, Yahoo!, or Genentech can make up for a world of Webvans. You can't shoot for these kinds of results without an expectation that every transaction invested in has the potential to generate a huge premium above the capital that's been put to work. You might consider that premium part of the "takeover" value of a venture-backed company.

If you search a 409A report, or an MD&A (Management's Discussion and Analysis) section of a registration statement, for the phrase "enterprise value," you will definitely find it in reference to how options were priced. Similarly, if you search the AICPA Practice Aid, you will find enterprise value used in a variety of ways. But if you search for the phrase "takeover value" in this context for any of the venture-funded companies that went public in 2010, or probably any other year, you won't see a reference to it. Why is that important? Because you can't take over a company without paying down or otherwise assuming its interest-bearing debt. This makes sense to most people. So long as the company is judged by its debt holders or the market to have the ability to service its debt, the enterprise value (takeover value) includes payoff costs to those holders.

EXHIBIT 5.3 Netflix Round-to-Round Pricing versus Volatility Used

Date	Series/Round	Shares	Price/Share	Amount Raised
Oct-97	Series A	3,990,000	$0.50	$1,995,000
Mar-98	Series A	454,545	$0.55	$249,999
Jun-98	Series B	5,684,024	$1.08	$6,138,745
Feb-99	Series C	4,650,269	$3.27	$15,206,379
Jun-99	Series D	4,649,927	$6.52	$30,317,524

Source: SEC Filings Imported by Liquid Scenarios, Inc.

How many 409A valuation reports have you seen that state an enterprise value that's close to what VCs in the deal would require to sell their interest? This speaks both to the required return for these investors and the required volatility needed to induce them to invest the first dollar into an enterprise. Looking at the round-to-round price distributions for successful venture-backed companies illustrates true volatility of values within companies that perform as investors expect when placing their bets. Exhibit 5.3 is a summary of preferred stock financing rounds for Netflix, one of the most successful venture-backed companies.

Exhibits 5.4, 5.5, 5.6, and 5.7 summarize the preferred financing rounds of some of the other standout venture-capital returns, including Excite, Yahoo, Google, and LinkedIn.

We can start our discussion with the "takeover" values, or the amounts VCs in each of these deals would require before approving a sale of their portfolio companies. It's obvious by some of the dates listed in the tables above that in a return-rich environment like the late 1990s, few VCs are investing with an eye toward 5X to 10X multiples in 10 years. Notwithstanding that, let's use today's standards, reflecting the required rates you often see cited by investing professionals, venture-capital associations, 409A valuation reports, the AICPA, limited partner associations, and most parties

EXHIBIT 5.4 Excite Round-to-Round Pricing versus Volatility Used

Date	Series/Round	Shares	Price/Share	Amount Raised
Jul-95	Series A	2,250,000	$0.67	$1,500,000
Nov-95	Series B	1,220,000	$1.23	$1,500,000
Dec-95	Series C	309,278	$2.91	$900,000
Mar-96	Series D	1,367,312	$8.00	$10,938,496

Source: SEC Filings Imported by Liquid Scenarios, Inc.

EXHIBIT 5.5 Yahoo Round-to-Round Pricing versus Volatility Used

Date	Series/Round	Shares	Price/Share	Amount Raised
Apr-95	Series A	5,200,000	$0.20	$1,040,000
Nov-95	Series B	2,538,072	$1.97	$5,000,002
Mar-96	Series C	5,200,000	$12.50	$63,750,000

Source: SEC Filings Imported by Liquid Scenarios, Inc.

that have a need to know returns for venture as an alternative investment category.

Exhibit 5.8 is adapted from an interactive form I wrote in the business valuation software I released in 1999, so around three years after Yahoo! and Excite went public, four years before Google went, about the time Netflix started trading, and over a decade before LinkedIn filed for its IPO. Long before then, this approach, reducing a periodic rate of return to a schedule of related payback multiples, was used by valuation professionals, VCs, and other financial professionals to put target returns into perspective. My only contribution at the time was that my software-based form enabled users to simply click on one of the variables, desired multiple, or rate of return and generate an indication of value through the discounted cash flow and capitalization of earnings methods we discussed earlier.

Two things you will notice when looking at the version of the form reproduced here is that to get a required rate of return of 40% in two years, an investment only has to double in value during that time. I say "only" not because a 40% return isn't exceptionally attractive in any market, but partially because in that short period of time few, if any, early-stage VCs are going to exit a transaction. You often hear a 10X multiple cited as a target return by investing partners of early-stage funds. For that reason, I've added emphasis below to amounts closest to a 10X return multiple at the respective exit dates (time horizon row labels, in years found in the left column) and required percentage return rates in the table below. If you look closely for

EXHIBIT 5.6 Google Round-to-Round Pricing versus Volatility Used

Series/Round	Shares	Price/Share	Amount Raised
Series A	15,360,000	**$0.06**	$960,000
Series B	49,823,000	**$0.50**	$24,677,332
Series C	6,479,000	**$2.34**	$15,177,058

Source: SEC Filings Imported by Liquid Scenarios, Inc.

EXHIBIT 5.7 LinkedIn Round-to-Round Pricing versus Volatility Used

Date	Series/Round	Shares	Price/Share	Amount Raised
Nov-03	Series A	3,990,000	$0.32	$4,700,000
Oct-04	Series B	454,545	$0.55	$10,000,000
Jan-07	Series C	5,684,024	$1.08	$12,800,000
Jun-08	Series D	4,650,269	$3.27	$53,000,000
Nov-08	Series D	6,599,987	$11.47	$75,701,851

Source: SEC Filings Imported by Liquid Scenarios, Inc.

a moment, you will find that something very important is missing in years one and two in the chart below.

In Exhibit 5.8, you will notice there are no 10X returns in years one and two (rows one and two) even at an annual return of 110%. So if VCs are really looking for a 10X return at that stage, which there's tons of evidence to support that they are, then in order to take the company over you are going

Years (Time Horizon)	Required Rate of Return (Discount Rate)									
	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%
1	1	1	2	2	2	2	2	2	2	2
2	2	2	2	3	3	3	4	4	4	5
3	2	3	3	4	5	6	7	**8**	**9**	**11**
4	3	4	5	7	**8**	**10**	13	16	19	23
5	4	5	8	**10**	14	19	25	32	41	52
6	5	8	**11**	17	24	34	47	64	86	113
7	6	**11**	17	27	41	61	89	128	180	249
9	**11**	21	38	69	119	198	323	512	794	1,207
10	14	29	58	110	202	357	613	1,024	1,668	2,656

Multiple (Rounded) Required to Realize Required Rate of Return

EXHIBIT 5.8 Required Rates of Returns to Realize Cash-on-Cash Multiples

to have to give the VCs a return of more than 120% per year in the first two years. To get 10X in two years implies a required rate of return of around 220% per year. This table should remind us of two critical elements that are generally lacking in both the valuations done for venture-fund reporting to LPs in accordance with GAAP as well as virtually every 409A valuation that's used to avoid tax penalties on employees and as a basis for stock-based compensation accounting and disclosures in financial statements. The two missing elements are:

1. An appropriate volatility estimate, and
2. A related acknowledgment of the true takeover values of these companies at different points in time.

In the absence of these elements, a series of questions emerges that most Topic 812, Topic 718, and 409A related valuation conclusions have difficulty answering. For instance:

If investors that "control" a series of preferred and control the flow of additional investment funds into the company, require returns in excess of "120%" over the first year or so of an enterprise, how appropriate is it to use a 60% to 80% volatility estimate retrieved from a publicly traded company where investors consider a "10 bagger" the exception to the rule? If a return of 20X, 10X, or more is required, and there are no financial fundamentals that support those types of returns, is the pool of potential buyers for a company larger or smaller? If the pool of prospective buyers is smaller, and the volatility is greater, what does that say about the marketability of an interest held by an employee who:

- Has no control rights to change any board decisions with respect to financing and exits, and
- Doesn't have access to required information to make a reasonable decision with respect to intrinsic value?

Both volatility and takeover value for a given venture-backed company are closely related to who the investors in a deal are and what securities they've purchased. Also related are the types of investors the current VCs backing the company have worked with previously and the reputation of those VCs, since these factors will determine the pool of additional investors available to lead future rounds, if and when they are needed. Chapter 7 presents additional examples of how volatilities typically relied upon in valuing venture-backed companies tend to be substantially below what's generally observed for these companies in the real world. Before getting

into that, I'll review how who's making an investment impacts the range of potential returns and, therefore, the volatility.

THE REALISTIC RANGE OF POSSIBILITIES DEPENDS ON WHO THE INVESTORS ARE

As we've discussed previously, the most likely positive event for a venture-backed company in any given year is not an exit event but rather a financing event, which generally means a new series of preferred or the issuance of some convertible debt. As we've also discussed, and will continue to do so, inputs into the size and potential terms of future financing events, prior to a liquidity event, remain a missing element in most valuations for tax, portfolio company financial reporting, and fund financial statements issued to limited partners. When valuation professionals, auditors, and other parties look at the same inputs that will shape decision making by key stakeholders of the company in the coming year, more reliable value indications emerge. Most of these inputs are easy to obtain, as illustrated in the upcoming list, and begin with the same focus on "people" or "who" that is the foundation for most venture-backed company financing decisions.

Readily Observable Inputs to PCo. Values

- Who (existing VCs were, new investors are, IRRs/stages, GPs)
- What (security/rights they purchased, how does that mix impact their target future returns and present returns/residual value?)
- When (timing of prior financing transactions versus expected timing of future transactions, expected burn rate/runway)
- Why (pro-rata with outside lead? secondary sale?)
- How much (size of the rounds, magnitude of the required returns, implications on future volatility)?

Instead of focusing on this more reliable input to value indications, current valuation efforts filtered through auditor scrutiny and direction rely heavily on future financial results projected out three to five years. These inputs, along with financial data from "comps," or the market approach, are often given more weight than future financings that will occur far sooner than when a venture-backed company will be truly "comparable" financially to a publicly traded company. In addition to the obvious weaknesses of this prevailing approach, which includes the cost of quantifying speculative estimates of future earnings to justify a present value of a future potential exit that will occur at an unknown time period, it takes the attention away from the parties most likely to influence value within any 12-month period.

Who Invested Impacts Volatility, Future Financing Rounds, and Today's Value

Taking a quick look at the Series A shareholders in Yahoo and LinkedIn and you will notice the two share a common investor. If you go a step further and analyze the investors of LinkedIn, Excite, Netscape, and Google, it's clear that a small, small community of investors is generating worlds of opportunities. The power of their networks amplify the range of possible exit multiples as previous endeavors succeed financially, giving founders and funds greater margin to bank critical errors in between. However, take a closer look and you realize that each of the Series A investors are a little different.

Although Netscape, Yahoo, and Excite each relied on professional venture capitalists for their Series A rounds, Google's Series A round was composed of angel investors. Why does this make a difference? Because those investors, in some cases, approach realizing returns and interacting with management teams a little differently than an organized fund does. This means that if we are viewing their investments in preferred stock as debt securities with high, double-digit interest rates (the takeover costs), then they may not have the mandate to swing for the bleachers the same way VCs do. If this assumption is true, then you would expect the volatility of angel-funded deals to be lower than those funded entirely by VCs. Data from the Angel Capital Association suggests that may in fact be the case.

In the case of Netflix, the Series A investor was also the co-founder of the company and ultimately took the reins as CEO. So why does that make a difference? Well, an individual investor/co-founder who's recently come off an extraordinary win, with a personal stake that easily rivals that of many small venture funds at the time, may have a different threshold of financial success for an investment than a venture fund, with multiple portfolio companies will. Again, this can, potentially, impact volatility, assuming professional VCs never come into the deal. But as we've mentioned, volatility is good for options, and each of these Series A investments, whether made by an angel or a founder, are in fact options on future gains in company equity. See Exhibit 5.9. Fortunately, in both cases, VCs came in with valuations

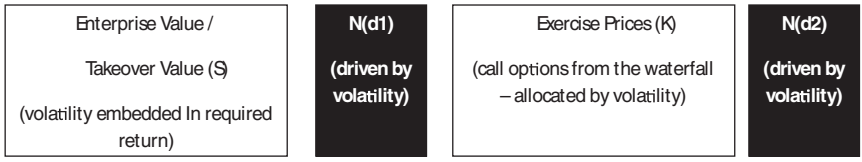


EXHIBIT 5.9 Volatility (sigma) Is Impacted by Who the Investors Are and as a Result So Is Value
Source: SEC Filings Imported by Liquid Scenarios, Inc.

EXHIBIT 5.10 Netflix Founder Stock Pricing and Ownership Allocation

Netflix Series A – Led by Founders – No Professional VCs

Founder	Founder Shares	Pro-Rata	Per Agreement	Implied Consideration	Per Books (par)
Marc B. Randolph	2,700,000	84%	$0.05	$135,000	$2,700
Reed Hastings	500,000	16%	$0.05	$25,000	$500
Total	3,200,000	100%		$160,000	$3,200

Source: SEC Filings Imported by Liquid Scenarios, Inc.
From internal agreements, it's clear that the founders intended to record their shares at 10% of the preferred price. However, since it's a related party transaction, and also due to potentially negative tax consequences, they ended up recording their common stock at par, which, of course, is the standard.

that represented unrealized appreciation for the founder of Netflix. In the case of Google, the angel investors were of such notoriety that professional VCs were fortunate to get in on the deal. See Exhibits 5.10, 5.11, and 5.12.

In a lot of cases where the founders participate in their own Series A, much less lead the Series A, they don't maintain their pro-rata ownership on subsequent rounds. Some early-stage VCs and angels have an investing discipline that they will only participate on the Series A or first round and not participate in any future rounds. If you are viewing each round of financing as having both a call and put feature embedded in it, then to a certain extent that option is being sacrificed, which means that some value has left the investor. Ideally, that party would have the opportunity to transfer that right to another investor for a fee, but that might not be practical with a small and close-knit industry.

One example of this from earlier would be the case of Twitter we mentioned in Chapter 1. One of the prominent investors in Twitter who had the

EXHIBIT 5.11 Netflix Series A Round Led by Co-Founder versus VC

Netflix Series A – Led by Founders – No Professional VCs

		Series A	Price	Amount	Pro-Rata
17-Oct-97	Reed Hastings	3,800,000	$0.50	$1,900,000	95%
17-Oct-97	Muriel Randolph	50,000	$0.50	$25,000	1%
17-Oct-97	Other Series A Investors	140,000	$0.50	$70,000	4%
Total		3,990,000		$1,995,000	100%

Source: SEC Filings Imported by Liquid Scenarios, Inc.

EXHIBIT 5.12 Netflix Series B VC Increase in Value over Series A

Netflix Series B Investors – "Just" 2.16X the Series A Price				
Institutional Venture Partners	3,703,703	$3,999,999	$1.08	68.23%
Reed Hastings	1,655,092	$1,674,999	$1.01	30.49%
Joan Hastings	46,296	$50,000.00	$1.08	0.85%
Muriel Randolph	23,148	$25,000.00	$1.08	0.43%
Total	$5,428,239	$5,749,998		100.00%

Source: SEC Filings Imported by Liquid Scenarios, Inc.

option, or preemptive right, to participate in subsequent preferred rounds chose not to. The value of this option would, as a result, effectively be transferred to other existing investors based on most shareholder rights agreements. Although these rights are not officially accounted for or recorded, they will ultimately show up in fund returns, which was the case with the Twitter investor who chose not to participate on the subsequent financing round. Fortunately, in the case of Netflix, the founder had the inclination and capacity to execute that option and realized a substantial reward as a result of doing so.

At this point, in the Series B round shown in Exhibit 5.12, there's a professional VC in the deal, Institutional Venture Partners, and that VC owes a duty to its LPs to aim for the returns we displayed in the matrix earlier. So what has to happen to Netflix for IVP to either exit or write up its investment by 10X? If the enterprise value of Netflix increases tenfold, will that do it? Not unless that increase is accompanied by another round of venture financing led by an outside investor. Even then, the rights to cash flow for IVP may be slightly less than those of the lead investors, which would mean that even if the round is priced at 10X what IVP paid for the Series B, the full increase might not be reflected in the residual, or unrealized portfolio value, of IVP's fund.

Without looking back at the prior round-to-round increases in the companies we've looked at thus far in Exhibits 5.3, 5.4, 5.5, 5.6, and 5.7, would you guess that the volatility observed in the preferred stock is greater than or less than 100%? Now, considering that most of these companies had IPOs that were offered at prices far below the first-day closes, would you imagine that the volatility of the preferred stock would be below 150%? Below 80%? Interestingly enough, if you look at the registration statements for any of these companies, you will find that only one, Google, has a single period (2001) during which it used a volatility estimate of 100% for the optionality of the derivatives. In each of those cases, except the case of LinkedIn, that approach makes sense because it was simply being used

purely to comply with accounting rules and didn't have an adverse impact on the largest group of direct stakeholders in those companies when they were private (employees).

In the case of Yahoo, Excite, and Netflix, the volatility figure they used wasn't actually used to estimate the value of the company's common stock, or to "allocate" an "enterprise value" to the common stock. Instead, those companies were using the volatility input to measure the potential earnings impact of options overhangs and communicate that to public investors in a manner that accounted for the both time value of a range of possible prices for their liquid, marketable, common stock.

If the early-stage venture funds that have invested require a return of at least 220% in the first two years, what does that say about the volatility of the common stock? If the volatility of the common stock is higher, does that make the options on the common stock worth more money or less money? Neither of those are trick questions. However, with even a little bit of experience with traded options you know that higher volatility generally makes options worth more money, not less money. So how could using a lower volatility estimate result in overpricing employee stock options?

Part of the answer lies in the obvious differences between private company options and publicly traded options. Traded options are generally on underlying securities that trade frequently with sufficient liquidity, quoted bids, asks, and volume. In the absence of those characteristics, which we will include in the general category of "marketability" for purposes of this book, one has to reduce the value of the underlying security to account for the inability to realize proceeds until an uncertain future date, at an uncertain future price. As a result, the larger the size of the volatility estimate, the larger the reduction (unfortunately also referred to as a "discount" by valuation professionals) that will be applied against the employee options in general.

This is illustrated in greater detail in the cases at the end of this chapter. In the Yahoo case, for instance, we applied 100% volatility, with two years assumed before a liquidity event, and the same risk-free rate we used for each of the other Yahoo examples for consistency; this resulted in a discount for lack of marketability of around 49%. Applying this DLOM to the $0.13 per common stock value that was produced by backsolving for the Series A price at 100% volatility, we end up with a net value per share of common stock of around $0.06 per share, or 30% of the Series A original issue price of $0.20 per share. This value indication, net of the DLOM, was substantially less than value indicated when we used the 53% volatility disclosed in Yahoo's filings or the 65% benchmark you find in many 2010/2008 filings. Despite a substantially higher enterprise value conclusion generated using our hypothetical estimate of 100% volatility, this same higher volatility generated a lower indicated value per share of common stock due to its impact on the DLOM calculation. The true volatility for these companies,

based on observed changes in their preferred share pricing, is certainly higher than 100%.

You could easily use any of the volatility-related functions in Excel, such as STDEV/STDEVP, VAR/VARP/VARA, for instance, to get a good estimate of variability and therefore volatility and applying those measurements to the natural logs of the price chances determined using the NL (natural logarithm) function. For those who don't use Excel a lot, the STDEV function returns an estimate of the standard deviation of a "sample" population, whereas the STDEVP function returns the standard deviation for the population, which is what the P on the end of the function name standards for. Since standard deviation is the square root of the variance, a choice needs to be made as to which estimate of variance to use. One of those choices involves either adjusting the estimated population of values, n, for the reality that we are dealing with a sample by using "n-1" in the denominator of the variance formula instead of using "n."

Without using Excel or even pulling out your calculator, you could simply observe that a private company that's seen its preferred stock go from $0.50 to $6.52 in less than five years is probably more volatile than its publicly traded "peers." In this case, the price appreciation happened in less than 20 months. However, if a third-party 409A valuation was done of that company in the three to four years since the rule became law for these types of companies, you could bet money that the volatility estimated for purposes of estimating stock option value would have been substantially lower than the observed volatility in the company's own stock. In fact, if you thumb through the other cases in this book you will find that most venture-backed companies disclosed public "peer"-based volatility estimates in the range of 60% to 70% in most cases.

The argument for using public comps for volatility estimates is a reasonable one, often emphasizing a lack of quantitative data from a large enough sample size to justify alternative volatility inputs. But in reality, there have been a fair number of studies done of round-to-round volatilities and, perhaps more applicably, venture financing return variability. Each of these studies concludes volatilities in the area of 100% or a little more for VC returns. This raises the question, is the company's preferred stock more volatile or less volatile than its common stock?

The assumption would be that the common stock is more volatile, since its rights to cash flow are derived, netted, from the preferred stock's rights for these companies. Similarly, since most preferred stock has some form of anti-dilution protection, the absolute range of potential downward price adjustments is not as steep as is the case for common stock that does not have this protection. Although the revised AICPA Practice Aid does not acknowledge this, revisions of the AICPA's Practice Aid do acknowledge higher volatility of the common stock in VC-backed companies by including

methods used by some practitioners, in theory, to "lever" volatilities. The most recent version of the Practice Aid specifically acknowledges that "[i]n cases where the preferred stock is entitled to a liquidation preference before the common stock begins participating, the common stock is more leveraged and hence has higher volatility than the overall equity volatility."

Since this is almost always the case with a venture-backed company, it's fair to say that most parties agree that common stock in these companies is more volatile than preferred stock. The remaining issue today concerns where the input for volatility comes from and how its magnitude compares to the true dispersion of prices and returns typically experienced by these types of companies. This can be addressed, as we've noted, by focusing on the dispersion of expected prices for the next round of venture financing, as opposed to focusing almost exclusively on anticipated sale scenarios, which tend to be more speculative and further into the future.

Simply observing the values recorded for common stock are not always a good measure of volatility, though. For instance, if you look at any venture-funded company, the founders of the company have the most volatile original issuance of shares in almost every case based on the issue price, as opposed to the intrinsic value. On a practical basis, the deemed issue price for the first common stock issued to founders is typically par value ($0.001 in many cases). Experienced founders recognize that there is in fact substantially more value, but that it requires capital, a first round of financing, and time, which involves subsequent rounds of financing leading to a liquidity event. Valuations, of any kind, for venture-funded companies that are not faced with an imminent IPO or acquisition need to focus on the next round of financing to generate a meaningful conclusion. That conclusion should reflect, in part, the true volatility that's weighing on pricing for that subsequent round as well as required returns for previous rounds. This applies to both 409A valuations for employee stock options and Topic 820 (FAS 157) valuations for venture funds.

OVERSTATING RETURNS AND UNDERSTATING RETURNS ON THE SAME ASSET (SIMULTANEOUSLY)

Applying the same numbers we used in Exhibit 5.2 to illustrate the devestating impact of "fair value" on employee stock option returns, increasing employee return hurdle rates by 900% in some cases, we can effectively convey how a similar potential for LP and fund losses exists. Consider the shared use of "market value," more or less, by LPs to describe "venture-fund book value" in Exhibits 5.14, 5.15, 5.16, and 5.17 and then look at all the possible ways GPs can, and still do, record the value of the exact same investment using examples shown in Exhibit 5.13.

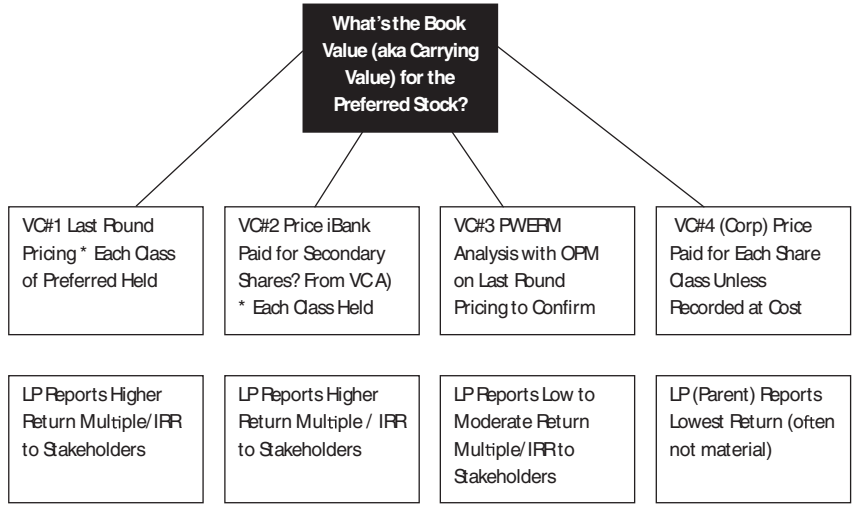


EXHIBIT 5.13 Inconsistent VC Book Value, Fair Value, Reports to Limited Partners

Source: SEC Filings Imported by Liquid Scenarios, Inc.

Note: Each result above is considered "book value" once it passes auditor scrutiny. Each result, however, is materially different. Imagine that LP is a single entity, Limited Partner #1, and each VC in the Exhibit has invested the same amount into the same exact portfolio company's preferred round on the same investment date. LP has committed the same amount of capital to each VC listed on the same date. The LP's "value multiple" reported to stakeholders on VC#1 would be 4.1X, VC#1 would be 3.5X, VC#3 5.0X, and VC#4 (corporate fund) would be 0X, negative IRR%. Each could be in accordance with Generally Accepted Accounting Principles and each would lead a reader of those performance reports to a different conclusion.

Ask a 12-year-old if she wants her money in a fund earning investors 5X or in or a fund earning investors less than 1X their money. Ask a 50-year-old the same question and you will probably get the same investment decision, but perhaps with more qualifiers.

Exhibits 5.14, 5.15, 5.16, and 5.17 illustrate summaries of how certain limited partners report their venture-capital results (returns) to their stakeholders. Note how in this context, higher "market values," or "fair values" both result in higher "return" conclusions. (In these exhibits, please note that boxes in black indicate materially different metrics or definitions for an item.)

As you would expect, and hope, fiduciaries and investment professionals at the limited partners investing in venture-capital funds are considerably

California Public Employees' Retirement System (CalPERS) Format

Cash In (A)	Cash Out (C)	Cash Out & Remaining Value (D) – C = B	Investment Multiple (Not Cash On Cash) A / (C+B)	Net IRR (not cash IRR)

EXHIBIT 5.14 CalPERS Cash-on-Cash versus Residual Return Report Format
Source: Summary of Layout from CalPERS Reports.

University of Texas Investment Management Company (UTIMCO) Format

Capital Invested (A)	Capital Returned to UTIMCO (C)	GP's Assessment of Current Value (B)	Cash-on-Cash Return (Multiple) A/C	IRR (not cash IRR)

EXHIBIT 5.15 UTIMCO Cash-on-Cash versus Residual Return Report Format
Source: Summary of Layout from UTIMCO Reports.

Washington State Investment Board Format

Paid-In-Capital (A)	Capital Distributed (C)	Current Market Value (B)	Total Value Multiple (not cash on cash) A/(C+B)	Net IRR (not cash IRR)

EXHIBIT 5.16 Washington State Cash-on-Cash versus Residual Return Report Format
Source: Summary of Layout from Washington State Investment Board Reports.

Regents of University of California Format

Cash In (A)	Cash Out (C)	Current NAV (B)	Investment Multiple (not cash on cash) A/(C+B)	Net IRR (not cash IRR)

* Boxes in black indicate materially different metrics or definitions for an item.

EXHIBIT 5.17 University of California Cash-on-Cash versus Residual Return Report Format
Source: Summary of Layout from University of California Regents Reports.

more rigorous in how they track the value of portfolios of venture-capital investments than employees are of the options they hold in any particular venture-backed company. That being said, these same institutions have had to struggle with what the true value of their investments are from period to period in addition to the known risk of estimating when any gains will be turned into cash (realized).

With information this specific to an industry and practice area, selecting different data to highlight can sometimes be used to reinforce a biased perspective, including my professional views on valuing these companies for financial reporting purposes. As a result, I've made every attempt to include tables obtained from sources that are generally available on the Web simply by searching for the groups mentioned for those who want to compare my conclusions using the more detailed source documents. Fortunately for our discussion, the four LPs in our example use the terms "Market Value," "Remaining Value," "GP's Assessment of Current Value," and "Current NAV [Net Asset Value]" to describe the same thing, despite using different terminology to do so. This is quite helpful because it speaks to the wide variety of performance conclusions being conveyed from the venture-fund financial statements to the limited partner financial statements and to the stakeholder perceptions of performance for most venture funds. Although the return percentage impact of this confusion is not as significant as it is for employees of venture-backed companies, the magnitude of the cash-on-cash multiple impact is of course substantially greater.

WHAT HAPPENS TO FUND IRRs WHEN YOU ASSUME BOOK VALUE EQUALS MARKET VALUE?

Perhaps the best way for all readers, not just alternative investment professionals, to appreciate this question is to first ask an analogous version of the question at the portfolio company level versus the fund level. See Exhibit 5.18.

With no further information, which company in Exhibit 5.18 looks like it has more traction? Exhibit 5.19 has a little more information about Company A and Company B, showing their relative earnings (EBITDA).

Private equity investors might want to have a closer look at the financial statements for both companies to make a decision. Angels might like to know more about the industry and all investors, especially VCs, will want to know who the existing investors are and who the management team is before saying they would choose Company A over Company B.

Another way to look at the question is to consider a comparison of revenue between two venture-funded companies targeting the same market/customers, with one venture-funded company showing $32 million in revenue for the year ended and the other showing $38 million in revenue for the same period. Both companies represent strong period-to-period momentum, but by and large the company that grew both EDBITDA and "revenue" would get the most attention.

In this particular case, however, both companies have the exact same number of orders/closed deals and the exact same cost structure. One has simply adjusted its contracts so that the accounting rules enable them to

EXHIBIT 5.18 Differences in Revenue Recognition and Perceived Value/Traction

	Portfolio Company A			
	Year 3	**Year 5**	**Growth X**	**CAGR**
Net revenue	1,195,000	32,486,000	27	421%
	Portfolio Company B			
	Year 3	**Year 5**	**Growth X**	**CAGR**
Net revenue	1,195,000	38,209,000	32	465%

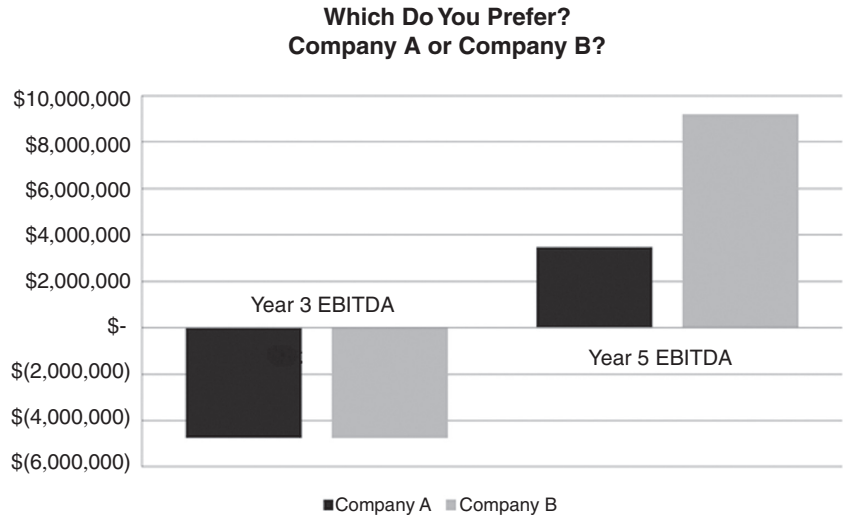


EXHIBIT 5.19 Illustration of EBITDA Reporting Differences and Perceived Value/Traction

record all of the revenue at once. Now, which company do you prefer? Although this may seem like an extreme example, and of course if you dig through the financials you will see that the companies have the exact same free cash flow, perception is obviously very powerful and harder to explain even if you are attempting to be "conservative."

With that in mind, consider the chart we presented in Exhibit 5.13, showing how five different VCs accounted for, reported in their financial statement and, as a result, caused limited partners to report in their financial statements five different performance records for the exact same investment. Now, take a look at the returns displayed in Exhibit 5.20. What does this say about true return volatility versus ongoing improvements in record keeping?

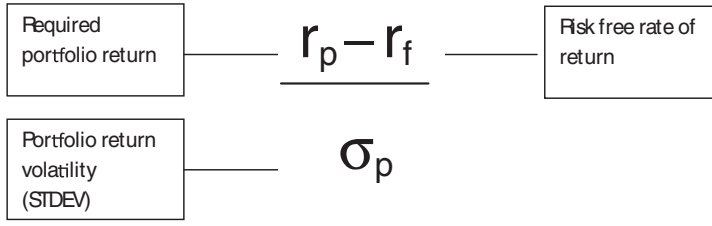
EXHIBIT 5.20 Variation in Fund Returns Reflect Even Higher Volatility in Underlying Assets

Partnership Name	Capital Invested	Capital Returned to UTIMCO	Current Value	Cash-on-Cash Return	IRR
Fisher Lynch Venture Partnership, L.P.	28,640,000	2,040,340	23,164,959	0.07	−5.05%
Foundation Capital IV, L.P.	20,004,870	1,517,513	24,532,058	0.08	5.55%
Foundry Venture Capital 2007, L.P.	24,650,000	4,530,594	57,948,661	0.18	72.44%
Sofinnova Venture Partners VII, L.P.	11,400,000	0	9,914,580	0	−7.62%
Spark Capital II, L.P.	9,918,500	0	13,008,615	0	19.18%
TCV V, L.P.	27,441,000	19,546,425	19,632,527	0.71	9.63%
TCV VI, L.P.	28,861,000	9,644,412	21,188,830	0.33	2.90%
TCV VII, L.P.	11,290,000	0	9,975,374	0	−11.56%
Union Square Ventures 2004, L.P.	22,250,000	14,287,506	55,870,113	0.64	54.71%
Union Square Ventures 2008, L.P.	7,500,000	0	6,894,491	0	−8.99%

Source: UTIMCO Reports.

Let's switch gears briefly back to volatility, which is directly related to required returns. As we transition back to the symbiotic relationship between required returns and volatility, it's a good time to take a look at a shortcut way to appreciate this relationship using a simple formula, the Sharpe Index. Although sometimes criticized for its primary purpose, comparing risks and returns associated with more liquid asset classes than venture, this tool still provides a meaningful way to explain venture dynamics in the context of competing objectives and risk dynamics of stakeholders with different classes of securities.

The beauty of the Sharpe Ratio is that it's easy to calculate and easy to understand. For our purposes here, explaining the role of often inappropriate volatility assumptions on VC security pricing makes the tool perfect. You can read it like you read a grade point average, so a higher number is generally better, compared to someone else's lower number. The three components are described in Exhibit 5.21.



$\frac{r_p - r_f}{\sigma_p}$	Substituting subscript p, "portfolio returns" with venture returns, subscript v, we end up with the formula at right.	$\frac{r_v - r_f}{\sigma_v}$
EARLY STAGE FUND ASSUME σ = 70% 10X in 5 Years Target (60%– 1%) = 59% Sharpe Ratio = 59%/ 70%= 0		EARLY STAGE FUND ASSUME σ = 100% 10X in 5 Years Target (60%– 1%) = 59% Sharpe Ratio = 59%/ 100%= 0.59
BALANCED FUND ASSUME σ = 70% 5X in 5 Years Target (50%– 1%) = 49% Sharpe Ratio = 49%/ 70%= 0.70		EARLY STAGE FUND ASSUME σ = 100% 5X in 5 Years Target (50%– 1%) = 49% Sharpe Ratio = 49%/ 70%= 70%

EXHIBIT 5.21 Sensitivity of VC Return Risks to Perceived/Disclosed Volatility
Source: Liquid Scenarios, Inc.

Beyond some legitimate technical issues with using the Sharpe Ratio for this type of an analysis, there are two obvious issues that bring the output into question. First, notice how the early-stage venture fund appears to be a better bet using the hypothetical inputs. That is to say that it receives a better risk adjusted performance grade than the balanced fund under each scenario calculated. On the surface, anyway, we would expect that a fund with a lower target return would have somewhat lower risks. As such, we would expect the variability of the returns to be lower. This may or may not in fact be the case in reality. However, it's highly likely that the volatility of returns for the early-stage fund is going to be different than the volatility of the balanced fund over certain time periods. As a result, the time period for our volatility estimate is an important one, as illustrated in Exhibit 5.21.

THE REAL COST OF FAIR VALUE, FAIR MARKET VALUE, AND ENTERPRISE VALUE

The most evident cost of the terms fair value, fair market value, and enterprise value (or business enterprise value) to the venture-capital community goes beyond the fees incurred for fair value opinions, 409A, Topic 820 (FAS 157), or audit field work for Topic 718. Fortunately, the biggest cost is also the easiest to address. In order to do so, an understanding of the terminology is needed. Fair value has sometimes been defined by others, particularly certain valuation professionals long before 409A and Topic 718 (FAS123R) had an impact on venture funded companies, as follows, "Fair market value with discounts for lack of marketability (DLOM) and discounts for lack of control (DLOC) added back will give you fair value."

This particular definition is of great importance to us because it implies that "fair value" would generally be higher than fair market value. One of the very first things you will see in a 409A valuation report, in the MD&A section under the stock-based compensation portion of a venture-backed company's registration statement, is a "marketability discount" or "liquidity discount." Venture capitalists and limited partners who have experienced the winding down of a fund or the exchange of an LP interest versus the sale of an entire portfolio will also almost universally see in these transactions a "discount" that reflects a limited pool of buyers and other restrictions that impact liquidity.

When I was a young adult experimenting with technical analysis to program option trading strategies, the one reality that stuck with me remains applicable in most financial situations: "There are two sides on every trade, so if one party is making money, they are getting that profit from another party that's losing profit." That sounds like a "zero-sum" game, but doesn't always have to be. For instance, one party gained liquidity and some capital

appreciation, and another party gained an opportunity to realize future capital appreciation. When someone takes a small profit, another party may be taking a loss as a result, or simply realizing a smaller profit as a result.

Here's an example that's directly applicable to our discussion regarding enterprise value, liquidity, and control as it relates to allocating value to venture-backed companies. The market rallies by 20% in a period and some of your holdings are up 50% at the close. You immediately put in a sell order, and a fair amount of other investors do the same thing. Assume you realize your 45% of your gain in cash and that by the close of that trading day the market is down. The financial press says the "market was down on profit taking." Naturally, there were parties taking profits, but many parties that sold or held positions took losses on that day and that process happens each and every day. If venture-backed companies in that liquid market are realizing volatilities in excess of 60%, with public investors reasonably seeking appreciation of perhaps 8% to 12% per year, it's obvious that investors seeking higher returns such as those in the tables below are realizing substantially higher volatility. Using this lower volatility rate for venture-backed companies, along with a longer time period that doesn't take into account new financing rounds means that even when "profits are taken" or realized, someone in a deal has lost value along the way. See Exhibit 5.22.

What's an Allocation Method?

As you've come to realize from the previous chapters, there's a lot of terminology that appears redundant in the valuation space. In the beginning of this book, before getting into the income approaches to valuation, we attempted to clarify some of the confusion caused by multiple uses of the word "discount" in the context of valuing a company. As we start to explore what many valuation professionals refer to as "allocation" methods,

EXHIBIT 5.22 Implied Rates of Returns from Studies in AICPA Practice Aid

Implied "Target Rates of Return" as Discussed in AICPA Practice Guide			
Stage of Development	**Plummer**	**Scherlis and Sahlman**	**Sahlman, Stevenson, and Bhide**
Startup	50% to 70%	50%–70%	50%–100%
First stage or "early development"	40% to 60%	40% to 60%	40% to 60%
Second stage or "expansion"	35% to 50%	30% to 50%	30% to 40%
Bridge/IPO	25% to 35%	20% to 35%	20% to 30%

Source: AICPA Practice Aid.

it's important to explain why and how the term is being used for valuations of venture-capital-financed companies.

If you look at recent registration statements for venture-funded companies, as we've done throughout this book, you will notice that the MD&A sections (Management's Discussion and Analysis) generally repeat text found within valuation reports that essentially say "first we estimated an enterprise value—then we allocated those values." This is in accordance with AICPA guidelines and also with valuation guidelines for private equity funds. The rationale is that you can't allocate portions of the company equity value to different equity classes until you've first valued the total company value separately using one of the three valuation approaches discussed previously. See Exhibit 5.23.

That logic, of first getting an enterprise value independent of recent market indications the security values before "allocating," seems to make sense if we are talking about valuing a security that:

a) has a liquid market,
b) does have at least some history of meaningful revenue, and/or,
c) does have at least the reasonable prospect of generating growing free operating cash flow within the next 18 to 24 months.

Of the cases we've referenced thus far in this book, only one of the venture-funded companies meet the three criteria noted above. It's for this reason that the first thing a party looking at a venture-funded company is going to look at with respect to valuation is the last-round pricing, and that makes perfect sense. In the context of a valuation, the longstanding approach of examining the last-round price per share paid for a given series of preferred and applying a discount to arrive at the value of common stock, or the value of other junior stock in some cases, is more or less how things still work, assuming the last round has closed within three to six months. The real difference today has a lot more to do with how the discount (reduction in value) is arrived at, quantified, and validated.

STEP 1. Estimate Enterprise Value	**STEP 2.** Allocate Enterprise Value to Securities
(in many venture-backed cases, this is total equity, since there's no significant debt)	(again, this generally involves equity securities or quasi-equity securities for venture-backed companies)

EXHIBIT 5.23 Popular Two-Step, Top-Down 409A VC-Backed Company Valuation Process

So a practical interpretation of disclosures that says "we first estimated an enterprise value and then allocated that value" might be as follows:

> *First we looked at the price per share paid by VCs in the most recent round of financing. Then we looked to see if the company had revenue and if so how much. If the company didn't have significant revenue but did have a recent round of venture financing, we assumed that the common stock value would be worth something greater than 10% of the last round financing price per share and something less than 50% of the last round pricing per share, which we immediately tested for by backsolving for the last round using an option pricing method. This was done if the last round occurred within six months of our valuation. Next, we looked for comparable companies to use in assessing enterprise values using a market approach. In the case of public guideline companies that were comparable we used an average of their, volatilities as an input to the Black-Scholes or binomial models. We also considered the betas of those guideline public companies as an input to betas to apply in the capital asset pricing model used to support the discount rate used in our discount cash flow (DCF) model. Revenue multiplies of the guideline public companies we felt were comparable to the company being valued we used in our terminal values and sanity tests.*

While that type of disclosure might not sound as elegant to auditors or some 409A valuation professions, it's a logical approach to both revealing a "fair market value" in accordance with Revenue Ruling 59-60 and a "fair value" in accordance GAAP. See Exhibit 5.24.

Note that despite the efforts of Topic 820 (FAS 157) to create a unified definition of fair value, it's worth noting that accounting rules that define "Fair Value" for equity-based compensation in financial reporting use a slightly different standard. We aren't going to distract you from the primary focus of this chapter, which has more to do with your actual rights to investment cash flows and how that impacts value. Still, it would be reckless not to include a side-by-side comparison of these separate definitions. The AICPA Practice Aid effectively specifies the fair value to be used in 409A engagements as: "A valuation performed for the purpose of valuing privately held company securities issued as compensation under US GAAP should be based on the definition of fair value used in FASB ASC 718 and 505-50." It should also be noted that this definition of fair value is slightly different from the definition under FASB ASC 820, Fair Value Measurements and Disclosures, in which fair value is defined as: "The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between

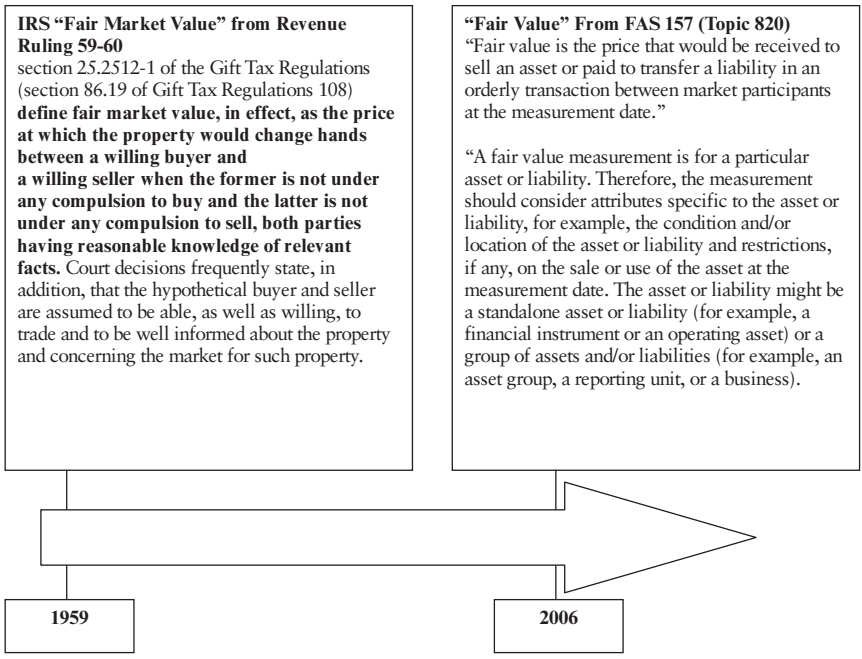


EXHIBIT 5.24 Revenue Ruling 59-60 Fair Market Value versus FASB Fair Value

market participants at the measurement date." In addition, the definition from Topic 718 (FAS123R) is: "The amount at which an asset (or liability) could be bought (or incurred) or sold (or settled) in a current transaction between willing parties, that is, other than in a forced or liquidation sale."

Who Are the "Market Participants"?

The "market participants" referred to in Topic 820 (FAS 157) are buyers and sellers in the principal (or most advantageous) market for the asset or liability who are:

- Independent (i.e., not related parties);
- Motivated (or, freely willing, not forced) to buy/sell; and
- Have the authority and resources to buy/sell.

When VCs and founders discuss "deal terms" or "valuation," they aren't truly discussing the "enterprise value of the company," the "discounted cash flow value of the enterprise," or even the "VC-method-derived value of the company." As noted previously in Chapter 1, after the investor has validated

the people and the opportunity, the question before him or her is "What fully diluted ownership percentage are we getting?" Granted, that fully diluted percentage ownership target does get expressed as a pre-money value and post-money value during negotiations and does hold a psychological significance to more than a few founders and investors. Still, "What percentage of the company will I own?" is really at the heart of the discussion. In the context of a company with no material physical assets and often solely the consensus promise of creating intangible assets that have yet to be completed or yet to be validated as fitting a customer/market opportunity, does that sound more like a "valuation" or more like an "allocation"?

If you're thinking, "It kind of sounds like a little of both," that's because it is in fact a little of both. So if that approach is a good starting point for the primary "market participants," it makes sense that it should be the natural starting point for those attempting to quantify the behaviors, past, present, and future, of market participants. The cases that follow examine each of the "allocation" methods and go on to illustrate how these methods can successfully be used to obtain a superior indication of value than applying traditional valuation techniques to early-stage companies. As you review the case studies and related calculations that follow, you will find that allocation and valuation are in fact integral when it comes to valuing venture-funded companies.

YAHOO! CASE

Application of OPM, Backsolve, Protective Puts, Waterfalls, CVMs, and Various Volatilities to Yahoo's Securities and Major Shareholders

Exhibit 5.25 shows one of the ways the backsolve method was used to reverse into a total equity, or "business enterprise value," for Yahoo. This was done in a manner consistent with how a valuation profession would match the Series A original issue price (split adjusted) to the Black-Scholes values based on the "claims" on Yahoo's equity due to deal terms, most significantly the $1 million liquidation preference of the Series A in this case.

In this first illustration, there were no stock options included in the calculations. While this may seem unusual, Chapter 6 discusses why this is not an unusual thing to see in a valuation analysis when the company doesn't have vested or granted options. Another missing element in this analysis was the discount for lack of marketability, or DLOM. Using a protective put to calculate the DLOM, assuming 65% volatility, a 2% risk-free rate, and an assumed exit time horizon of two years results in an estimated marketability discount of around 33%. This reduces the net value indication for the common stock from $0.11 per share to $0.07. As you will read in a

EXHIBIT 5.25 Yahoo! Backsolved Option Pricing Method Model at 65% Volatility

	Total	Series A Liquidation Preference	Common Participates	Series A Converts
Breakpoints		Breakpoint 1	Breakpoint 2	Breakpoint 3
Strike Price (K)		$0	$1,040,000	$3,040,000
BEV Estimate (S)	$2,125,901	$2,125,901	$2,125,901	$2,125,901
Breakpoint Call Value	$2,125,901	$853,531	$727,307	$545,063
Call Value at Floor		$2,125,901	$1,272,369	$545,063
Term in Years (t)		2.00	2.00	2.00
Risk-Free Rate (r)		2.00%	2.00%	2.00%
Volatility		65.00%	65.00%	65.00%
d1		26.37	1.28	0.11
d2		25.45	0.36	−0.81
N(d1)		1.00	0.90	0.55
N(d2)		1.00	0.64	0.21
S ∗ N(d1)		$2,125,901	$1,913,076	$1,159,467
K ∗ e^-rt		$0	$999,221	$2,920,800
Times N(d2)		$0	$640,707	$614,405
C Value at Ceiling		$1,272,369	$545,063	$0
Common	$1,085,901	$0	$727,307	$358,594
Proceeds Prior Breakpoint		$0	$0	N/A
Proceeds This Breakpoint Ceiling		$0	$2,000,000	N/A
Difference		$0	$2,000,000	N/A
% of Range Proceeds		0.00%	100.00%	65.79%
Pro-Rata Percentage		0.00%	100.00%	65.79%
Option Value to Security	$1,085,901	$0	$727,307	$358,594
Value per Share	$0.11	$0.00	$0.07	$0.04
Series A	$1,040,000	$853,531	$0	$186,469

Source: Liquid Scenarios, Inc. Used under license agreement. Copyright 2003–2011 bpCentral, Inc. Patent pending.

moment, the risk-free rate in 1995 was in fact much higher than the 2% we used in this first illustration. The rate used in the first illustration is closer to the rates you would find disclosed by companies that were actually guided to use this methodology in order to comply with tax and financial reporting requirements. Yahoo! went public over a decade before these rules went into effect, but still provides an excellent example of longstanding weaknesses

EXHIBIT 5.26 Yahoo! Back Volatility and Risk-Free Rate Assumptions in 1995 and 1996

	Expected life	Interest rate	Volatility	Dividend yield
1996	30 months	5.1%–6.5%	53%	0%
1995	30 months	5.3%–6.0%	NA	0%

Source: Yahoo! SEC Filings.

with the volatility inputs used in models for high-growth, venture-backed companies.

Another opportunity to test my assertion that these valuation tools, as they are often applied, result in understating the value of the company while simultaneously overstating the value of the common, is to use the volatility estimate actually disclosed in Yahoo's filing with the SEC, 53%, and compare the resulting backsolved enterprise value, as well as the resulting DLOM adjusted common stock value.

Recall that the prevailing instinct is that as the volatility is increased, the value of the options will increase. So if we are applying a lower volatility estimate to Yahoo using the Black-Scholes option pricing method and backsolving to an enterprise value based on the Series A issue price, we should end up with a lower indicated enterprise value, which we do. See Exhibit 5.27.

Whereas the Exhibit 5.25 used 65% as the volatility estimate, to make the outcome more comparable to what you see used for post-409A companies (based on public peer volatility in 2007, 2008, 2009, and 2010), using the 53% from Yahoo's 1996 financial statements produces a backsolved enterprise value of $2,082,844 as illustrated in Exhibit 5.27. If the process stopped there, we would simply end up with a slightly lower indicated value for the company and a somewhat lower value for the common stock. However, in most cases the volatility will be considered as an input into how the common stock discount for lack of marketability is calculated. As a result, we end up with a lower put value when the volatility input is lower and therefore a lower discount for the common stock. The lower discount results in an estimated value for Yahoo's common stock that's 14% higher than was indicated at the higher volatility, despite an enterprise value that's actually about 2% lower. See Exhibit 5.28.

In the next iteration we'll apply a volatility that's closer to what venture-capital investors tend to experience, 100% volatility, and see how that impacts the values indicated before and after discounting the common stock for a lack of marketability based on Yahoo's Series A price. See Exhibit 5.29.

EXHIBIT 5.27 Yahoo! Backsolved Option Pricing Method Model at 53% Volatility

	Total	Series A Liq. Pref.	Common Participates	Series A Converts
Breakpoints		Breakpoint 1	Breakpoint 2	Breakpoint 3
Strike Price (K)		$0	$1,040,000	$3,040,000
BEV Estimate (S)	**$2,082,844**	$2,082,844	$2,082,844	$2,082,844
Breakpoint Call Value	$2,082,844	$909,683	$792,234	$380,928
Call Value at Floor		$2,082,844	$1,173,161	$380,928
Term in Years (t)		2.00	2.00	2.00
Risk-Free Rate (r)		2.00%	2.00%	2.00%
Volatility		**53.00%**	**53.00%**	**53.00%**
d1		32.13	1.35	−0.08
d2		31.38	0.61	−0.83
N(d1)		1.00	0.91	0.47
N(d2)		1.00	0.73	0.20
S * N(d1)		$2,082,844	$1,900,070	$978,046
K * e^-rt		$0	$999,221	$2,920,800
Times N(d2)		$0	$726,909	$597,118
C Value at Ceiling		$1,173,161	$380,928	$0
Common	$1,042,844	$0	$792,234	$250,610
Proceeds Prior Breakpoint		$0	$0	N/A
Proceeds This Breakpoint Ceiling		$0	$2,000,000	N/A
Difference		$0	$2,000,000	N/A
% of Range Proceeds		0.00%	100.00%	65.79%
Pro-Rata Percentage		0.00%	100.00%	65.79%
Option Value to Security	$1,042,844	$0	$792,234	$250,610
Value per Share	$0.10	$0.00	$0.08	$0.03
Series A	$1,040,000	$909,683	$0	$130,317
Proceeds Prior Breakpoint		$0	$1,040,000	N/A
Proceeds This Breakpoint Ceiling		$1,040,000	$1,040,000	N/A
Difference		$1,040,000	$0	N/A
% of Range Proceeds		100.00%	0.00%	34.21%
Pro-Rata Percentage		N/A	N/A	34.21%
Option Value to Security	$1,040,000	$909,683	$0	$130,317
Value per Share	$0.20	$0.17	$0.00	$0.03

Source: Liquid Scenarios, Inc. Used under license agreement. Copyright 2003–2011 bpCentral, Inc. Patent pending.

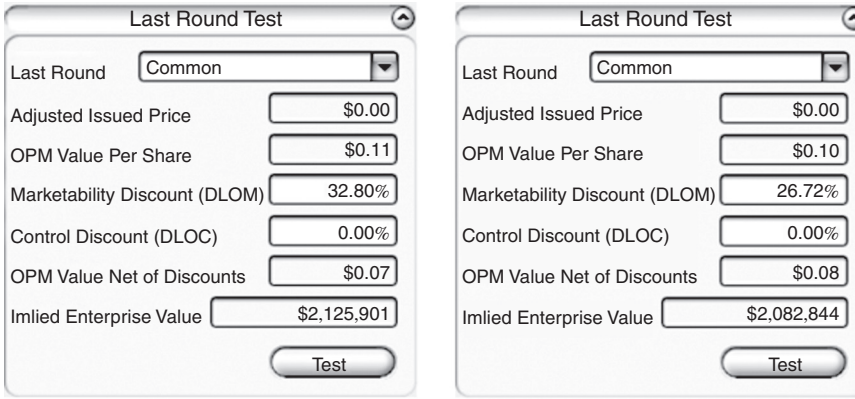


EXHIBIT 5.28 Yahoo! Protective Put at DLOM 65% and 53% Volatility
Source: Liquid Scenarios, Inc.

Applying a more appropriate, higher volatility to the venture-funded company, as we propose, yields a more reasonable estimate of both business enterprise value and common stock value without making any of the further adjustments recommended in this book. At 100% volatility a backsolved enterprise value of $2,297,027 is generated, as illustrated in Exhibit 2.29. This is the highest enterprise value produced thus far, but it generates the lowest common stock value, net of the DLOM, since the higher volatility generates a higher DLOM.

At 100% volatility, with two years assumed before a liquidity event, and the 2% risk-free rate we've used for each of the Yahoo examples thus far for consistency, a discount for lack of marketability of around 49% is calculated. Applying this to the $0.13 per common stock value that was produced by back-solving for the Series A price at 100% volatility, we end up with a net value per share of common stock of around $0.06 per share, or 30% of the Series A original issue price of $0.20 per share. While simply adjusting the volatility input doesn't get us all the way to 10% of the Series A price Yahoo's early hires were fortunate enough to get, it's a whole lot better for modern optionees than the result that would likely be generated by a 409A valuation using the lower volatilities based on public "peers." Equally as important, the logic is more consistent with reality and requires fewer "judgment"-based inputs to explain how the conclusions were reached.

One of the recent additions to the AICPA Practice Aid can offset this problem, in part, by effectively increasing the volatility input used for

EXHIBIT 5.29 Yahoo! Backsolve Value Indication at 100% Volatility

	Total	Series A Liq. Pref.	Common Participates	Series A Converts
Breakpoints		Breakpoint 1	Breakpoint 2	Breakpoint 3
Strike Price (K)		$0	$1,040,000	$3,040,000
BEV Estimate (S)	**$2,297,027**	**$2,297,027**	**$2,297,027**	**$2,297,027**
Breakpoint Call Value	$2,297,027	$676,528	$558,043	$1,062,455
Call Value at Floor		$2,297,027	$1,620,499	$1,062,455
Term in Years (t)		2.00	2.00	2.00
Risk-Free Rate (r)		2.00%	2.00%	2.00%
Volatility		**100.00%**	**100.00%**	**100.00%**
d1		17.61	1.30	0.54
d2		16.19	−0.12	−0.88
N(d1)		1.00	0.90	0.70
N(d2)		1.00	0.45	0.19
S * N(d1)		$2,297,027	$2,072,976	$1,618,131
K * e^-rt		$0	$999,221	$2,920,800
Times N(d2)		$0	$452,477	$555,676
C Value at Ceiling		$1,620,499	$1,062,455	$0
Common	$1,257,027	$0	$558,043	$698,984
Proceeds Prior Breakpoint		$0	$0	N/A
Proceeds This Breakpoint Ceiling		$0	$2,000,000	N/A
Difference		$0	$2,000,000	N/A
% of Range Proceeds		0.00%	100.00%	65.79%
Pro-Rata Percentage		0.00%	100.00%	65.79%
Option Value to Security	$1,257,027	$0	$558,043	$698,984
Value per Share	$0.13	$0.00	$0.06	$0.07
Series A	$1,040,000	$676,528	$0	$363,471
Proceeds Prior Breakpoint		$0	$1,040,000	N/A
Proceeds This Breakpoint Ceiling		$1,040,000	$1,040,000	N/A
Difference		$1,040,000	$0	N/A
% of Range Proceeds		100.00%	0.00%	34.21%
Pro-Rata Percentage		N/A	N/A	34.21%
Option Value to Security	$1,040,000	$676,528	$0	$363,471
Value per Share	$0.20	$0.13	$0.00	$0.07

Source: Liquid Scenarios, Inc. Used under license agreement. Copyright 2003–2011 bpCentral, Inc. Patent pending.

purposes of calculating the discount. This is accomplished by a rather simple formula (variables from the actual draft revised practice aid):

$$\text{Class Volatility} = \text{Equity Volatility} \times (\text{Equity Value} \times \text{Class N(d1)})/\text{Class Value}$$

Although "levering" the volatility does in fact increase the discount for lack of marketability on common stock to a figure that's more appropriate, the fundamental assumption that the volatility of the company's total equity value is comparable to the volatility of a public company still results in lower indications of total company value. Still, it's a step in the right direction to reduce the impact on employees of overvalued stock options. The actual elements that contribute to the appropriate volatility input for a venture-backed company are similar to the elements that impact an appropriate discount rate (or required rate of return) buildup for a privately held company.

Having improved the correlation between Yahoo!'s volatility, the appropriate discounts, and the resulting indicated values, now's a good time to move on to generating an even more accurate, higher, enterprise value estimate while verifying that a fair common stock value estimate and resulting fair option grant price is generated. We can start by reviewing our checklist of readily observable inputs and then placing them into waterfalls, OPM models, PWERMS (covered later), and CWERMS (also covered later) with future rounds taken into account to reach realistic value indications that account for the takeover value of the company and the related volatility of the various target returns by investor type and stage.

Yahoo's Readily Observable Valuation Inputs

Imagine Yahoo was founded by PhD candidates in Mobile, Alabama, had the same amount of traffic when it got venture capital, and was able to recruit a successful, high-growth CEO, albeit one without substantial tech experience. It's possible that the company could have raised a Series A financing that was comparable in size. So if we were to simply backsolve for an indication of the total equity value of the company using standard inputs we would find in a 409A valuation or Topic 820 valuation, we would of course end up with comparable results (the same value indication). Before going any further in this case, you might want to ask yourself, does that seem reasonable? You can also ask some questions while referring to the inputs from the following list.

Readily Observable Inputs Checklist

- Who (existing VCs were, new investors are, IRRs/stages, GPs)
- What (security/rights they purchased, how does that mix impact their target future returns and present returns/residual value?)
- When (timing of prior financing transactions versus expected timing of future transactions, expected burn rate/runway)
- Why (pro-rata with outside lead? secondary sale?)
- How Much (size of the rounds, magnitude of the required returns, implications on future volatility)?

If the entire state of Alabama, where you can certainly find comparably intelligent and motivated innovators, were helping Yahoo become the leader in its space using all their connections, it would be unlikely to rival the connections within one or two degrees of Sequoia and Stanford. What impact do you suppose being based in Alabama would have on Yahoo's Series B financing prospects? How would Yahoo's ability to recruit team members with the strong local professional networks needed to maximize traction and execution when a business model emerged have been different if Yahoo were based in Alabama, versus Silicon Valley?

Approaches to valuation used by professionals to appraise private companies in mature industries would use adjustments to the discount rate, as explained earlier, to adjust the risk and required return for Yahoo! of Mobile, Alabama. But as we've seen, companies like Yahoo don't fit easily within the constraints of a traditional discounted cash flow model. Even if it did, simply increasing the discount rate to reduce the present value to the amount invested would be perceived as what it was, a financial "plug," as we discussed earlier. Still, it's worth quickly reviewing how a valuation professional might adjust the required rate of return and therefore the valuation of Yahoo! assuming it was a private company that was not venture-funded. We then compare this to how a Wall Street analyst or M&A investment bank would make adjustments for enterprise or takeover value and how that relates to the backsolve methods being currently applied to many venture-backed company valuations today.

As discussed in Chapter 3, to apply a discounted cash flow method or capitalization of earnings method, we need our "financial hammer," the discount formula and an appropriate discount rate to use in that formula. We also need a future benefit stream to discount or capitalize (the "nails"). Since Yahoo!'s earnings before interest, taxes, depreciation, and amortization (EBITDA) are projected to be negative for each of the three years ending 1995, 1996, and 1997, the discounted cash flow approach is probably not going to work very well if we use EBITDA as the benefit stream. We could,

however, look at a multiple of projected revenue in 1995, 1996, or 1997 to get an indication of value as of any of those periods. If we use only "Lycos" and "Excite" as comparables to get a clue as to Yahoo!'s value as a multiple of projected revenue, we would give up statistical significance but make up for it with a superior indication of equity market demand for a brand new market sector, Internet Information Companies.

As discussed, this method of comparing metrics for comparable companies that trade publicly to the private company we are valuing would be considered by valuation professionals and auditors as a "market" approach to valuation. Since we are using projected revenue for the subject company, Yahoo!, we would still need to discount that future revenue to bring the value back today. That exercise, of discounting the future benefit stream (revenue), would be considered an income approach to valuation and would of course require us to use an appropriate discount rate. The discount rate we use will be composed on three general elements for a privately held company:

1. The risk-free rate (which we've discussed).
2. The required return in excess of the risk-free rate investors demand for bearing the risks of equity securities in general (what we referred to as the equity risk premium earlier).

   In the case of a smaller company like Yahoo!, it could be appropriate to include an additional premium to reflect the increased risks that come with dealing with investing in a smaller company.
3. A company-specific risk premium, which in the case of a privately held company would typically be arrived at based on an analyst's judgment.

You may recall from Chapter 1 that the risk-free rate plus the equity risk premium represent systematic risk that can't be diversified simply by owning equity interests in a variety of companies. Combing these premiums to arrive at an appropriate discount rate is known as a "buildup" approach. Since systematic risk (Risk-Free Rate + Equity Risk Premium + Industry Risk Premium + Size Premium) accounts for a larger portion of the required return in a traditional private company than in a venture-funded company, small differences can have a big impact. Fortunately, these inputs are generally sourced from reliable information providers.

How a Valuation Analyst Would Build Up a Discount Rate for Yahoo!

A valuation analyst builds a discount rate by summing the risk-free rate, the equity risk premium for large publicly traded stock, the industry risk

premium for the company's industry, and the size premium. Each of these elements can be obtained from independent sources such as Ibbotson Associates' *Stocks, Bonds, Bills and Inflation Yearbook*, which tracks average total returns (capital appreciation and dividend income) on large corporate equity issues from 1926 and to present. Duff & Phelps Risk Premium Report is another trusted resource for such data, albeit generated with slightly different criteria and methodology than Ibbotson.

The rate of return on a U.S. Government Treasury Bond is easily obtained from many reliable sources, such as Bloomberg, of course. This leaves only the company-specific risk. There are a variety of ways an analyst will support the company-specific risk premium he or she uses. A rough example that might apply to Yahoo! if it were a typical privately held company is as follows:

Company Specific Risk =
Management Team:0%
+ Dependence on Key Personnel: 2%
+ Technology Risk: 1%
+ Competitive Landscape: 1.5%
= Total Specific Company Risk Premium: 4.5%

In reality, the true company-specific risk for a venture-backed company would have to be a lot closer to the required rates of return capital providers, venture capitalists, and angels demand minus the risk-free rate, equity risk premium, size premium, and industry risk premiums sourced from the information providers previously mentioned. If you wanted to mix the two approaches to arrive at a discount rate, you might build it up as follows (all amounts are hypothetical for illustrative purposes only):

Risk-Free Rate: 6%
+ Equity Risk Premium: 9%
+ Industry Risk Premium: 3%
+ Size Premium: 2%
= Discount Rate before Adding Company-Specific Risk: 20%

Company-Specific Risk =
+ Management Team: −5%
+ Board of Directors: −5%
+ Capital Structure: 15%
+ Key Management Dependence: 6%

+ Competition: 12%
+ Burn Rate: 5%
+ Technology Risk/IP: 6%
  = Specific Company Risk Premium: 19%
  Discount Rate: 39% (Risk Free Rate + Equity Risk Premium + Company Specific Risk Premium)

Note, it's not often that you actually see negative amounts included in a company-specific risk buildup. But given the fact that management teams at venture-backed companies often have qualifications that rank in the top 0.01% of the world, and board members that rank even higher, it's not unreasonable to assume that these elements would counterbalance other specific risk. However, those same advantages would be offset by the dependence on key personnel, which generally increases risk and the return requirements embedded in the instruments used in the company's capital structure (preferred stock with sophisticated terms designed with a liquidity event in mind for instance).

Now that we have a hypothetical input, the discount rate, for our financial hammer, we can use it to get the present value of the benefit stream (projected revenue times the comparable multiple). Assume the comparable multiple was around 18 times revenue based on the guideline public companies and Yahoo! projected revenue of $22 million in 1996, you would simply multiply the 1996 revenue projection by 18 to arrive at a terminal value indication of $396 million. Since Yahoo!'s current revenue may be $0 or approaching $1 million depending on the date, we have to use our discount rate and time to bring the $396 million to a present value. If an analyst ends up with a number that seems high, naturally the company-specific risk will be increased. Alternatively, if an analyst ends up with a number that seems low, the company-specific risk can be decreased. But with this rather subjective input accounting for such a large amount of any value conclusions, prior to discounts for lack of control, you can easily see how the result can be perceived as a "plug." This is one of the reasons using an option-pricing methodology has become so popular, because it allows a more objective answer to be generated quickly and within the confines of the complex capital structures of venture-backed companies, as illustrated in Exhibits 5.30, 5.31, 5.32, 5.33, 5.34, and 5.35.

To successfully illustrate an accurate backsolve model requires an accurate capitalization table from which to derive pre- and most money "values." I will quickly review some of the sources of information that were used to generate the preceding models so that you can adjust the numbers yourself if appropriate and see how your conclusions differ due to better information concerning the pre-IPO capital structure and deal terms.

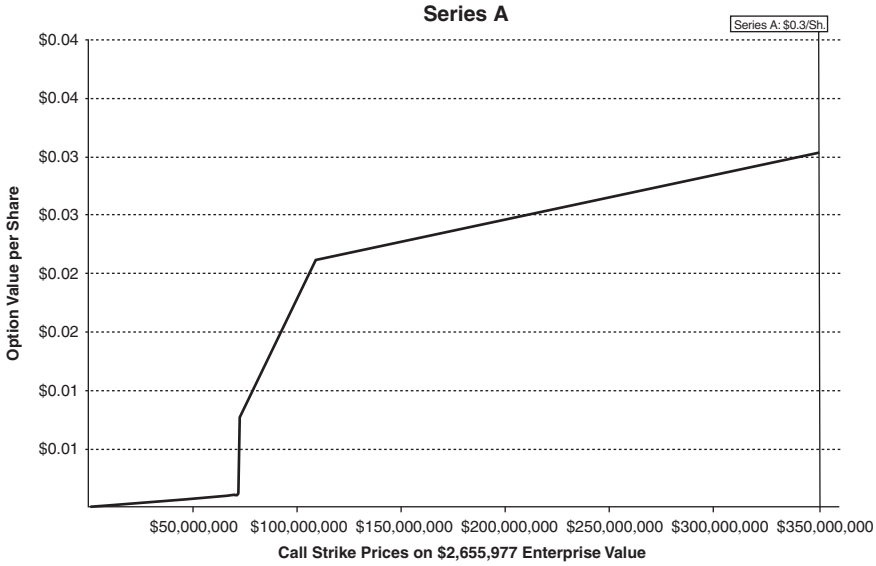


EXHIBIT 5.30 Yahoo! Series A Valuation Using Option Pricing
Source: Liquid Scenarios, Inc.

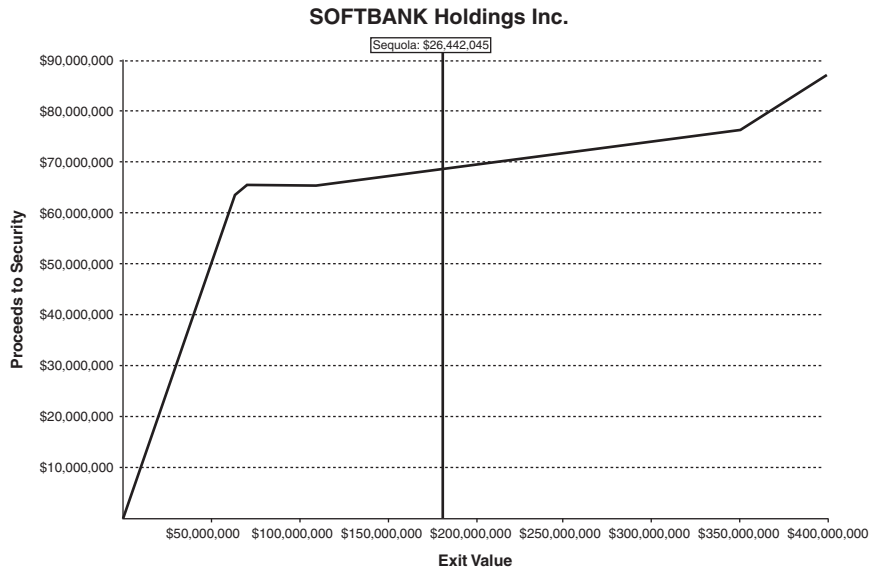


EXHIBIT 5.31 Softbank Proceeds from a Yahoo! Exit at $180MM
Source: Liquid Scenarios, Inc.

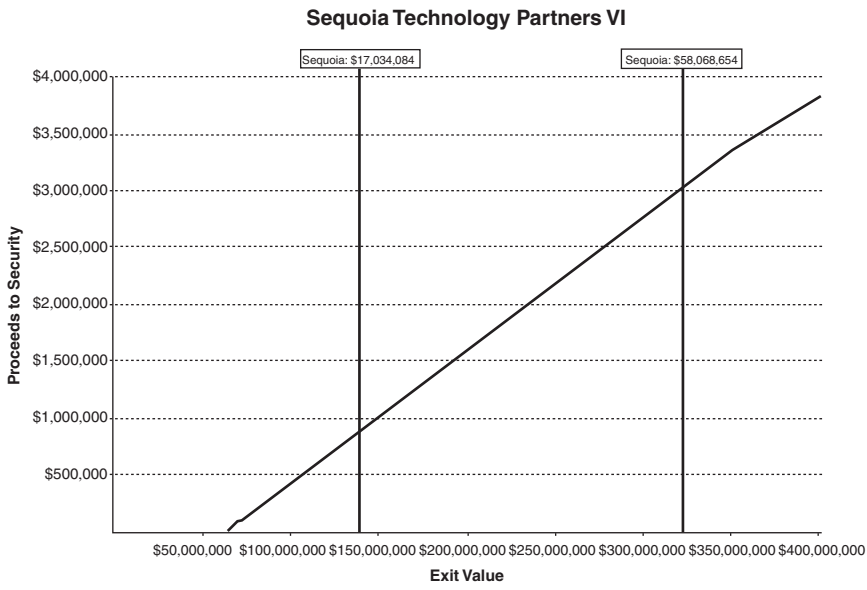


EXHIBIT 5.32 Sequoia Proceeds from a Yahoo! Exit at Various Values
Source: Liquid Scenarios, Inc.

I've seen, and heard, a number of resources suggesting that the initial Sequoia investment in Yahoo! was "$2 million." Since the only public record of the exact amount is available indirectly through the SEC filings, this is another reason for illustrating the methodology behind how we arrived at the figures. What's the difference between the $1 million we've noted below and the $2 million you see referenced elsewhere when a company skyrockets to over $100 billion in market cap (equity value)? Well, for purposes of the valuation techniques being illustrated here the difference is significant. Also, assuming it was $2 million instead of $1 million, the difference to investors that would have held those shares from original issue to the peak market cap would have been $10 billion.

One easy way to either source or confirm capital structure is financial statements if you don't have access to an actual cap table. In Yahoo!'s case, the financial statements filed with the SEC, particularly the statement of shareholders equity, suggest the amount was actually around $1 million. The relevant portions are reproduced in Exhibit 5.36 along with the related calculations.

The Statement of Shareholders' Equity doesn't include information about increases in the option pool. As noted earlier in this book, as well

	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%
1	1	1	2	2	2	2	2	2	2	2
2	2	2	2	3	3	3	4	4	4	5
3	2	3	3	4	5	6	7	**8**	**9**	**11**
4	3	4	5	7	**8**	**10**	**13**	16	19	23
5	4	5	8	**10**	14	19	25	32	41	52
6	5	8	**11**	17	24	34	47	64	86	113
7	6	**11**	17	27	41	61	89	128	180	249
9	**11**	21	38	69	119	198	323	512	794	1,207
10	14	29	58	110	202	357	613	1,024	1,668	2,656

	Common Stock Equivalents	Price per Share	Amount Raised
Sequoia	5,382,614	$0.37	$1,975,000
Sequoia Capital VI	4,898,180	$0.37	$1,797,252
Series A	4,436,250	$0.20	$887,250
Series B	461,930	$1.97	$910,002
Sequoia Technology Partners VI	269,130	$0.37	$98,749
Series A	243,750	$0.20	$48,750
Series B	25,380	$1.97	$49,999
Sequoia XXIV	195,000	$0.20	$39,000
Series A	195,000	$0.20	$39,000
Sequoia 1995	20,304	$1.97	$39,999

EXHIBIT 5.33 Sequoia Series A and Series B Yahoo! Investments by Fund
Source: Liquid Scenarios, Inc.

as in Chapter 6 on option pool calculations, the size of the pool reserve has a material impact on venture fund returns especially when a company realizes an "early" exit. You can occasionally find information about the size of the option pool reserve at different times in a company's history, prior to going public, by simply looking at the options note in the financial

EXHIBIT 5.34 Yahoo! Reverse Solve Exit Value That Yields $19.70 per Share

Net Exit Value by Security: as of 12/31/1996

	$447,440,018	**%**	**$/Sh.**	**x**	**$44,976,144**	**%**	**$/Sh.**	**x**
Series A	$102,440,000	22.89%	$19.70	**x98.50**	$10,400,000	23.12%	$2.00	**x10.00**
Conversion	$102,440,000	22.89%	$19.70	**N/A**	$10,400,000	23.12%	$2.00	**N/A**
Liquidation Preference	$1,040,000	0.23%	$0.20	**N/A**	$1,040,000	2.31%	$0.20	**N/A**
Series B	$50,000,018	11.17%	$19.70	**x10.00**	$5,076,144	11.29%	$2.00	**x1.02**
Conversion	$50,000,018	11.17%	$19.70	N/A	$5,076,144	11.29%	$2.00	N/A
Liquidation Preference.	$5,000,002	1.12%	$1.97	N/A	$5,000,002	11.12%	$1.97	N/A
Warrants	$0	0.00%	$0.00	N/A	$0	0.00%	$0.00	N/A
Common Stock	$197,000,000	43.98%	$19.70		$20,000,000	43.98%	$2.00	
Options - Vested Pro-Rata	**$98,500,000**	**21.99%**	**$19.70**	**x197.00**	**$10,000,000**	**21.99%**	**$2.00**	**x20.00**
Total:	**$447,940,018**	**100.00%**	**$19.70**	**N/A**	**$45,476,144**	**100.00%**	**$2.00**	**N/A**

Source: Liquid Scenarios, Inc. Estimates from SEC filings.

Security/Class	Shares Issued	Issuable	Fully Diluted
Pre-Money Shares	10,000,000	0	10,000,000
New Anti-Dilute Shares		0	0
Options Pool Increase		5,000,000	5,000,000
Pre-Money Totals	**10,000,000**	**5,000,000**	**15,000,000**
Proposed Series A	5,200,000		5,200,000
Post-Money Capitalization	15,200,000	5,000,000	20,200,000

Multiplying the pre-money capitalization (15,000,000) by the new round/Series A price per share ($0.20), we end up with $3,000,000

EXHIBIT 5.35 Yahoo! Series A Pre-Money Estimates
Source: Liquid Scenarios, Inc.

statement. These amounts sometimes don't go far back enough for you to get an exact number for the unissued pool, though. This is because if the company is beyond the development stage, it doesn't have to disclose as many prior-period financial details. In the case of Yahoo!, we were able to get the original option pool reserve simply by looking at the notes to its financial statements since the company was so young when it went public.

Exhibit 5.37 is from the Yahoo! 1996 Annual Report to Shareholders (10K) filed with the SEC.

As discussed previously, although the capitalization table, or cap table, is probably the most relevant record of valuation data for the majority of venture-backed companies, it's not an official financial statement. As a result, it's rare, but not impossible, to find a pure capitalization table in SEC filings. You can sometimes find a partial capitalization in the following documents and exhibits to the securities filings:

- Investors Rights Agreements: Look toward the end of the document in the signature area for a "schedule of investors" or "schedule of purchasers," which in some cases includes a detailed cap table. An example follows for Yahoo. Although it doesn't include common stock or options, it does have a breakdown of exactly how many shares (pre-split) are held by each preferred investor in Yahoo. This enabled us to discover more precise estimates of the rights to investment cash flow-specific holders had at different times leading up to Yahoo's IPO.
- Venture Leasing Documents and Related Forms of Warrants: In certain filings, there are warrant agreements filed in connection with a venture lease, or look toward the end of the document in the signature area for a "schedule of investors" or "schedule of purchasers," which in some cases includes a detailed cap table.
- Stock Purchase Agreement: There have been cases where the schedule of purchasers is filed as an exhibit to the stock purchase agreement. In

EXHIBIT 5.36 Yahoo! Shares Outstanding Post Series A

	Convertible Preferred Stock		Common Stock		Additional	Accumulated	
	Shares	Amount	Shares	Amount	Paid-In Capital	Deficit	Total
Issuance of Common Stock in connection with the formation of the Company	–	$–	10,000,000	$–	$–	$–	$–
Issuance of Series A Convertible Preferred Stock at $0.20 per share	5,200,000	5,000	–	–	1,018,000	–	**1,023,000**

Source: SEC Filings.

EXHIBIT 5.37 Yahoo! Option Pool Activity 1995 and 1996

	Available for Grant	Options Outstanding	Price per Share		
Shares reserved	5,000,000	–			–
Options granted	(3,454,910)	3,454,910	$0.02		$(0.20)
Options exercised	–	(189,400)			$0.02
Balance at December 31, 1995	1,545,090	3,265,510	$0.02		$(0.20)
Additional shares reserved	3,000,000	–			–
Options granted	(3,716,343)	3,716,343	$0.20	–	$20.88
Options canceled	281,000	(281,000)	$0.02	–	$18.50
Options exercised	–	(496,377)			$0.02
Balance at December 31, 1996	1,109,747	6,204,476	$0.02	–	$20.88

Source: Liquid Scenarios, Inc. with data imported from SEC Filings.

certain filings, there are warrant agreements filed in connection with a venture lease, or look toward the end of the document in the signature area for a "schedule of investors" or "schedule of purchasers," which in some cases includes a detailed cap table.

Exhibit 5.38 shows the Yahoo! Series A Investors from Shareholders Rights Agreement Filed with the SEC.

EXHIBIT 5.38 Yahoo! Series A Investors

Series A Investors	
Name/Address	**No. of Shares**
Sequoia Capital VI 3000 Sand Hill Road Building 4, Suite 280 Menlo Park, California 94025	2,218,125
Sequoia Technology Partners VI	121,875
Sequoia XXIV	97,500
Fred Gibbons, Trustee of The Fred Gibbons Separate Property Trust U/T/D 2/26/93 c/o Sequoia Capital	62,500
Timothy Koogle c/o Yahoo!, Inc. 110 Pioneer Way, Suite F Mountain View, CA 94041	50,000
VLG Investments 1995 2800 Sand Hill Road Menlo Park, CA 94025	21,250
Craig W. Johnson 2800 Sand Hill Road Menlo Park, CA 94025	21,250
James L. Brock 2800 Sand Hill Road Menlo Park, CA 94025	3,750
Tae Hea Nahm 2800 Sand Hill Road Menlo Park, CA 94025	3,750
Total:	2,600,000

Source: SEC Filings.

As mentioned, the shareholder rights agreement contains lots of relationships and agreements that should impact risk for different holders and securities. In a DCF analysis, these should be reflected in the discount buildup. If you are building up a volatility input, that's also a place to reflect some of these elements. But the most obvious, and easy, place to reflect them may be in your consideration of a discount for lack of marketability and control, since many of the control rights typically available to equity holders are superseded or enhanced for different parties, based on the shareholder rights agreement.

Secondary Sale of Common and Series A to SOFTBANK

Secondary sales of private company shares have always had an important impact on valuation. Although no formal venues for these transactions existed for VC-backed companies when Yahoo was funded, they still occurred when one party had realized appreciation and needed to "take money off the table" and provide liquidity to investors and the purchasing party was looking to increase its stake in a venture it believed had upside potential with reduced risk. Recent examples of this include transactions completed by DST in its purchases of shares of Zynga stock from Foundry Group, Union Square Ventures, the founder, and Avalon Ventures. That transaction was very similar to the one done between SOFTBANK and Yahoo!'s shareholders. The economic impact of SOFTBANK's purchase of around $12 million each from both founders, $24 million total, less than 24 months after they created their project, certainly changed some lives in a way that's hard to reduce to a valuation analysis. It's fitting that SOFTBANK's founder also obtained his first fortune from an invention he created as a student (at Berkeley, California).

Sequoia, who had also sold around $12 million to SOFTBANK at the Series C price, was able to realize a true cash-on-cash multiple on its investment prior to the IPO and still have substantial shares in the company that would go on to become worth billions.

Our next analysis in this case illustrates what happens to valuation when an anticipatory secondary sale takes place in advance of an IPO. Obviously, there's the risk that the IPO doesn't happen. A venture-funded example of that is the eProcrates case.

In addition, here is an excerpt from Yahoo's 10K filed with the SEC:

> *In April 1996, SOFTBANK purchased certain shares of the Company's capital stock from shareholders of the Company at a price of $12.50 per share, including shares held by Mr. Filo and an affiliated trust (996,250 shares), Mr. Yang and an affiliated trust*

(996,250 shares), and Mr. Koogle (100,000 shares), and entities affiliated with Sequoia Capital (996,250 shares).

During March 1996, the Company issued to SOFTBANK 5,100,000 shares of Mandatorily Redeemable Convertible Series C Preferred Stock at a price of $12.50 per share. All shares of Preferred Stock were converted into shares of the Company's Common Stock at the time of the Company's initial public offering of securities in April 1996. SOFTBANK is entitled to certain registration rights with respect to such Common Stock.

Exhibit 5.39 shows the impact of the secondary sale on potential payouts to various parties after selling, or buying, shares of Yahoo! prior to the public offering becoming effective. In today's world, these transactions would become market inputs used to value grants of options on common stock. Also, you can see from all of the illustrations here that the nature of Black-Scholes to bring the values of different classes of securities closer and closer together as they become comparable in the money due to escalating enterprise values is consistent with the real-world practice in the marketplace.

Also for reference, here are a few prices from the Yahoo! 1996 Annual Report to Shareholders (10K) filed with the SEC. This shows some of the additional appreciation realized by Softbank shortly after its private, secondary purchases of Yahoo's stock.

1996		
	High	Low
-	———	———
Second Quarter	$33.00	$18.25
Third Quarter	$24.00	$15.75
Fourth Quarter	$22.63	$17.00

For most of the other cases, we obtained the deal terms for the preferred stock from the company's certificate of incorporation or certificate of designation for the particular series. In the case of Yahoo!, we used the notes to the financial statements, since that was the most accessible resource. Based on those notes, there was 1X liquidation preferences for each series, and Series C also had cumulative dividends.

Yahoo! Case Conclusions

By applying the basic techniques of looking at (a) who invested, (b) the cash flow potential of their securities, and finally, (c) comparing potential outcomes using various observed and imputed rates of volatility, we were able to value each security as well as get objective indications for the company as a

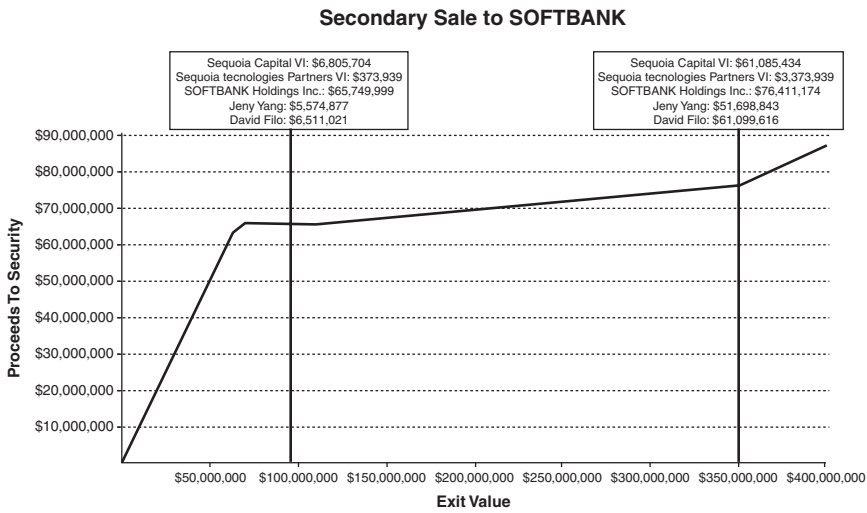


EXHIBIT 5.39 Payout Diagram Impact of Yahoo! Secondary Sales to Softbank
Source: Liquid Scenarios, Inc. with data imported from SEC filings.

Note: As an indication of volatility during first year trading, the original issue price is not reflected in "high/low," just close prices. True volatility impacting the value of the shares issued prior to the IPO, including common stock underlying the options and convertible preferred stock, would include the first-day gains above the original issue price. This can be appreciated somewhat by reviewing the disclosures in Yahoo!'s 10K filed after the company had been trading. Note that the offer price of $13 per share does not show up in the record since it was not a close price.

whole. Unlike traditional backsolve or other 409A-inspired methodologies, which make reconciling indicated values to value indications expressed by actual market participants problematic, the techniques we applied generated fair market values that were internally consistent using a market approach.

* * *

Before getting into the next case, Kayak.com, we are going to examine some of the other areas where valuation professionals, auditors, and venture-fund finance teams often struggle to reconcile rights to cash flow as of a given day using popular shortcuts and conventions. Particularly, we look at how the employee option pool is treated when determining payouts. We also touch upon similar conventions concerning cumulative dividends, in the Kayak.com case, as well as warrants in general. I refer to these derivatives as reasons to "D.O.W.T" venture-capital returns, which is an acronym for dividends, options, warrants, and time.