Venture Capital Valuation: Case Studies and Methodology
By Lorenzo Carver

CHAPTER 4

Applying the Typical DCF Model to a Venture-Backed Company Hardly Ever Works

"Compound interest is the eighth wonder of the world. He who understands it, earns it . . . he who doesn't . . . pays it."
—Albert Einstein

As mentioned, the DCF, or discounted cash flow, method is an income approach to valuation, for the most part. I say for the most part because as you will quickly realize, once we get beyond the cash flows we can "see" or "forecast" reasonably, there has to be a means to account for the value that exists beyond the forecast period. This is often called the "terminal value," but is referred to by some as "residual value," "continuing value," or "horizon value." In the case of venture-backed companies, that "terminal value" is in practice the second most important element driving fair market valuation outcomes, with interim venture financing rounds being the first. As a result, we are going to spend a little time reviewing some of the most popular ways of calculating terminal value for all companies before discussing if, and when, these models apply to venture-backed companies.

THE GORDON GROWTH MODEL

One of the most popular methods of estimating residual value beyond the forecast period is the Gordon Growth Model and variations of it. It's popular, in part, because it is relatively easy to implement and because it's easy to prove the math and logic behind it. It's also worth memorizing for anyone

outside of the finance profession, since even if it doesn't fit your particular circumstances for needing to value a security, it can give you a quick test of the reasonableness of an offer for potential future cash flows.

Strictly speaking, the model is composed of three elements:

D = Dividends (Or capacity/ability to pay dividends from earnings)

R = Required Return (For our purposes, the "discount" rate – this variable is usually noted as "k" or cost of capital)

G = Growth (Expected growth of "D" per period—my favorite part of the model)

With those three simple inputs we can calculate a value (V), or price (P), for a security today (V_0 or P_0). I first started to apply this formula to actual companies engaged in financing transactions before completing an undergraduate degree in finance. Many sophisticated angel investors, and their advisors, were receptive to it as a way of agreeing on the potential for companies in mature industries. The key qualifying factor is that—mature industries. If you start plugging variables into the model, you can very quickly see the role of growth on value, but you will also notice that when growth is rapid, as it is with venture capital-backed companies, the model breaks down.

Assume that Company A and Company B both have the ability to pay $5 per share in dividends one year from now (see Exhibit 4.1). With zero dividend growth in either company, the only variable we need in order to calculate a value for both stocks is our required return. If our required return is 8%, then both stocks are worth $62.50 per share based on the model. If Company B, however, is expected to be able to grow its dividend consistently at 4% per year, then its stock might be valued at $125 per share, or 2X the

Company A	Company B
$D_1 = \$5, r = 8\%, g = 0\%$	$D_1 = \$5, r = 8\%, g = 4\%$
$P_0 = \$5/(8\%-0\%) = \$62.50$	$P_0 = \$5/(8\%-4\%) = \$125.00$

EXHIBIT 4.1 Growth versus No-Growth Values

value of Company A's stock. Based on this very simple example, the role of growth in value becomes very clear and very hard to ignore. However, like all good things there are very practical constraints on when this model can be applied explicitly.

The best way to appreciate the limitations of this model, and how they relate to venture-backed companies, is to simply expand the simplified version of the equation to expose a critical variable: infinity. When the symbol "∞" is included in a valuation of cash flows, it's very important to consider the implications, since that essentially means "forever."

$$\sum_{t=1}^{\infty} D^*[(1+g)\hat{}t/(1+r)\hat{}t]$$

Without a lot of examination or research, almost anyone familiar with venture-funded companies realizes that most of them are not expected to last forever. This reality is reflected in the contractual lives of the venture capital funds that invest in these companies, which typically span 10 years, the total time horizon for realizing returns from invested capital, not including any extensions granted by limited partners. Similarly, if we look at traditional small businesses, it's clear that businesses started in relatively safe, mature industries with known earning parameters very rarely result in an entity capable of paying a dividend in perpetuity.

That being said, variations of this valuation tool are applicable to almost every company when trying to get a handle on the power of growth. But it's important to review the specific constraints inherent in the Gordon Growth Model as it relates to venture-funded companies. I'll start with the first most obvious constraint that users discover in the absence of the infinity symbol: subtracting growth from required returns when growth is really high.

HIGH GROWTH LIMITS THE GORDON GROWTH MODEL

As beautifully simplistic as the Gordon Growth Model is, it doesn't work so well when there's actual growth that falls outside of a few limiting constraints. A simple and popular example is where growth is high, or rapid, and then ultimately levels out or becomes "stable." See Exhibit 4.2 where, in the column at left (t), periods (rows) numbered 1–5 show rapid growth value, and period (row) number 6 shows stable growth value.

In such a case, it's common to see a bifurcated model that calculates early rapid growth from period to period using more of a typical DCF model and

EXHIBIT 4.2 Simplified Two-Step Model, with Different Rates of Growth

t	D	g	r	PV D @ r	PV Factor
1	$ 1.00	15%	8%	$ 0.93	93%
2	$ 1.15	15%	8%	$ 0.99	86%
3	$ 1.32	15%	8%	$ 1.05	79%
4	$ 1.52	15%	8%	$ 1.12	74%
5	$ 1.75	15%	8%	$ 1.19	68%
			Sum PVs	$ 5.27	
				D/(r-g)	
6	$ 1.84	5%	8%	$ 61.22	63%
			PV of D/(r-g)	$ 38.58	

then stable growth using the Gordon Growth Model. In other cases, you can see models and formulas that break down growth expectations into three or more stages or phases. If this seems like the basic concept we initially introduced, where we specifically forecast as many cash flows as we can reasonably estimate and then capitalize the last period to get a terminal value, that's because it is pretty much the same process. The only variation is the number of growth stages we are addressing.

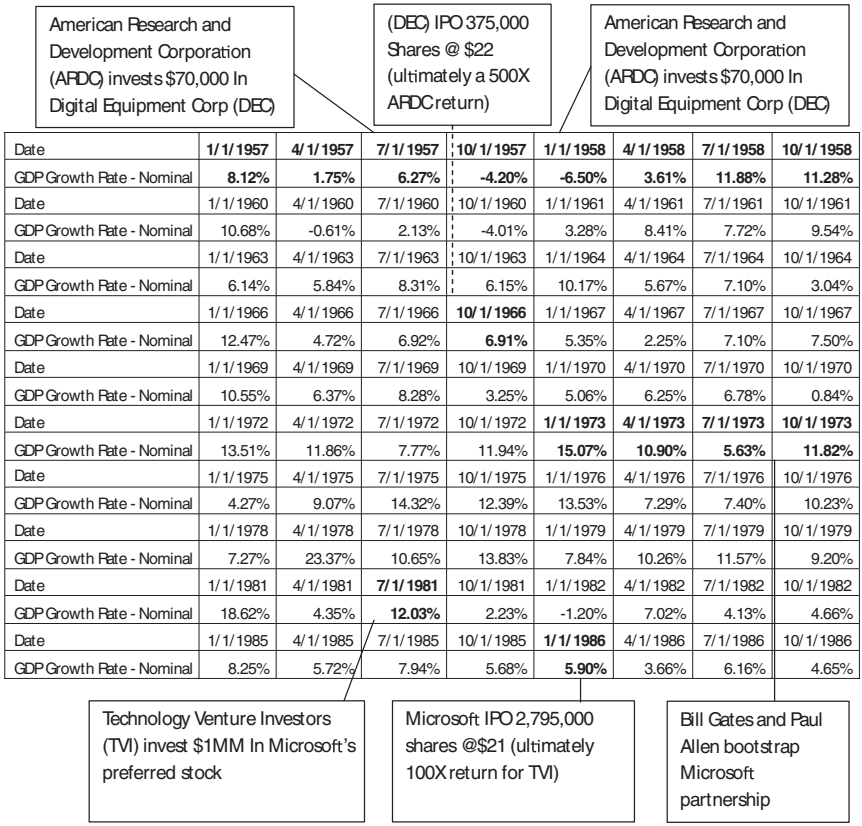
But what if growth is 30% per period and our required return is just 14% as in the following formula? Some would say that since we end up with a negative outcome, the Gordon Growth Model breaks.

$$D/(14\% - 30\%)$$

This is why one of the recommendations for using the Gordon Growth Model is that your expected growth rate be within a reasonable range of nominal GDP growth. When most people think of nominal GDP growth in the United States today, a figure in the range of 2% to 4% generally comes to mind, often 3% for much of the past two decades. In reality, nominal GDP growth has at times been in double digits, so this is a good general guideline. Exhibit 4.3 shows select nominal GDP rates.

As illustrated in Exhibits 4.4 and 4.5 in the summary rates of targeted and actual VC rates of return, the target return rates for venture-funded companies are substantially higher than nominal GDP growth in most periods.

Some observers might suggest that the more obvious constraint of the Gordon Growth Model as it relates to venture-capital valuation is not growth, but the lack of existence of dividends from a venture-funded company, which even after an IPO is unlikely to pay dividends any time soon,



Date	**1/1/1957**	**4/1/1957**	**7/1/1957**	**10/1/1957**	**1/1/1958**	**4/1/1958**	**7/1/1958**	**10/1/1958**
GDP Growth Rate - Nominal	**8.12%**	**1.75%**	**6.27%**	**-4.20%**	**-6.50%**	**3.61%**	**11.88%**	**11.28%**
Date	1/1/1960	4/1/1960	7/1/1960	10/1/1960	1/1/1961	4/1/1961	7/1/1961	10/1/1961
GDP Growth Rate - Nominal	10.68%	-0.61%	2.13%	-4.01%	3.28%	8.41%	7.72%	9.54%
Date	1/1/1963	4/1/1963	7/1/1963	10/1/1963	1/1/1964	4/1/1964	7/1/1964	10/1/1964
GDP Growth Rate - Nominal	6.14%	5.84%	8.31%	6.15%	10.17%	5.67%	7.10%	3.04%
Date	1/1/1966	4/1/1966	7/1/1966	**10/1/1966**	1/1/1967	4/1/1967	7/1/1967	10/1/1967
GDP Growth Rate - Nominal	12.47%	4.72%	6.92%	**6.91%**	5.35%	2.25%	7.10%	7.50%
Date	1/1/1969	4/1/1969	7/1/1969	10/1/1969	1/1/1970	4/1/1970	7/1/1970	10/1/1970
GDP Growth Rate - Nominal	10.55%	6.37%	8.28%	3.25%	5.06%	6.25%	6.78%	0.84%
Date	1/1/1972	4/1/1972	7/1/1972	10/1/1972	**1/1/1973**	**4/1/1973**	**7/1/1973**	**10/1/1973**
GDP Growth Rate - Nominal	13.51%	11.86%	7.77%	11.94%	**15.07%**	**10.90%**	**5.63%**	**11.82%**
Date	1/1/1975	4/1/1975	7/1/1975	10/1/1975	1/1/1976	4/1/1976	7/1/1976	10/1/1976
GDP Growth Rate - Nominal	4.27%	9.07%	14.32%	12.39%	13.53%	7.29%	7.40%	10.23%
Date	1/1/1978	4/1/1978	7/1/1978	10/1/1978	1/1/1979	4/1/1979	7/1/1979	10/1/1979
GDP Growth Rate - Nominal	7.27%	23.37%	10.65%	13.83%	7.84%	10.26%	11.57%	9.20%
Date	1/1/1981	4/1/1981	**7/1/1981**	10/1/1981	1/1/1982	4/1/1982	7/1/1982	10/1/1982
GDP Growth Rate - Nominal	18.62%	4.35%	**12.03%**	2.23%	-1.20%	7.02%	4.13%	4.66%
Date	1/1/1985	4/1/1985	7/1/1985	10/1/1985	**1/1/1986**	4/1/1986	7/1/1986	10/1/1986
GDP Growth Rate - Nominal	8.25%	5.72%	7.94%	5.68%	**5.90%**	3.66%	6.16%	4.65%

EXHIBIT 4.3 Select U.S. Nominal GDP Growth versus Venture Financing Events
Source: Liquid Scenarios, Inc. with data from U.S. Dept of Commerce: BEA.

EXHIBIT 4.4 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% to 70%	50% to 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.

EXHIBIT 4.5 Implied Actual VC Rates of Return as Discussed in AICPA Practice Guide

	5-Year Return		10-Year Return		20-Year Return	
Type of Fund	**2002**	**2008**	**2002**	**2008**	**2002**	**2008**
Seed/Early Stage	51.40%	3	34.90	25.50	20.40	22.10
Balanced	20.90	7.50	20.90	12	14.30	14.60
Later Stage	10.60	8.10	21.60	7.30	15.30	14.70
All Venture	28.30	8.70	26.30	13.40	16.60	17.20

Source: AICPA Practice Aid.

EXHIBIT 4.6 Dividend History of Leading Venture-Backed Companies

Issuer Offer Year	**Dividend Yield**
1 Microsoft 1986	16 Years After IPO, 0% Dividend
2 Dell Computer 1988	14 Years After IPO, 0% Dividend
3 Oracle 1986	16 Years After IPO, 0% Dividend
4 Cisco 1990	12 Years After IPO, 0% Dividend

Source: Liquid Scenarios, Inc.

as illustrated in Exhibit 4.6. However, a common explanation of why a dividend discount model can apply to companies that don't pay dividends is the "dividend irrelevance theory," which we will simply mention briefly as we start to transition into other methods of calculating the terminal value for venture-funded companies.

DIVIDEND IRRELEVANCE AND CAPITAL STRUCTURE IRRELEVANCE

The phrases "dividend irrelevance" and "capital structure irrelevance" can be easily misinterpreted in the context venture-funded companies. Miller-Modigliani's dividend irrelevance theory does in fact relate to venture-capital valuations in some ways. Coincidently, it's also used outside of venture capital to explain why adjustments to EBIT (earnings before interest and taxes) can be used to generate comparable valuations for firms that have the capacity to pay out dividends but do not declare dividends.

You could argue that Microsoft's stock splits effectively acted as dividends since the stock kept appreciating, which meant that shareholders

could in fact sell shares instead of taking dividends, much in the way Miller-Modigliani theorized a shareholder could do instead of taking retained earnings away from a company that could otherwise use the funds to grow its business. On the other hand, since the practice of splitting shares and thereby keeping the stock approachable by a broader range of individual investors is believed to have impacted liquidity and price appreciation, you might argue that the same item that tends to support their theory with respect to Microsoft's dividends challenges it with respect to Microsoft's capital structure.

The Capital Irrelevance theory also doesn't fit particularly well in the context of venture-funded companies. As you have seen already, and will see at increasing detail throughout this book, the most tangible, objective, and reliable input to the value of most venture-funded companies is in fact their capital structure. Also, the fact that the primary instrument used in venture financings typically has attributes of both debt and equity further complicates strictly applying this model to any element of venture-capital finance.

USING COMPARABLES (GENERALLY MARKET MULTIPLES) TO GENERATE A TERMINAL VALUE

To properly interpret and apply comparables, it's helpful to have a handle on some fundamental elements of the income approaches to valuation. For those who are not valuation specialists, some of the important relationships to remember follow. Keep in mind that these relationships are generalizations that are applicable to many moderate-growth companies, but often not applicable to venture-funded companies. However, they are useful for putting a context to required rates of return that are sometimes used to explain venture-capital valuations.

Capitalization Rate + Growth = Discount Rate (Required Rate of Return)
Discount Rate (Required Rate of Return) − Growth = Capitalization Rate
Discount Rate (Required Rate of Return) − Capitalization Rate = Growth

You should recall from earlier examples that business valuation professionals often will use a "capitalization of earnings" approach to determine the terminal value for traditional businesses that are expected to experience linear, stable growth beyond the forecast period if that growth is comparable to nominal GDP growth. Note that different valuation professionals have varying standards they apply as to what to compare reasonable growth in the Gordon Growth Model to, as opposed to suggesting nominal

GDP growth, as I do here. I've seen some of the best valuation professionals I know use inflation, real GDP growth, and even the risk-free rate as a benchmark for constant, stable growth in perpetuity to be used for a terminal value. I'm emphasizing this again because in order to properly interpret and apply comparables, it's helpful to have a handle on the income approach to valuation. The Gordon Growth Model we presented earlier is an excellent way to appreciate the connection between comparables, discounting, and capitalization, as illustrated in the preceding table.

When people mention the VC Method of valuation, you will often see some reference to an expected price earnings (or PE) ratio. Price earnings ratios, like many multiples, are attractive to many because they appear to be simple to apply and get a quick indication of relative value and, therefore, implied potential value. Despite the difficulties in getting consistent earnings information, there are other limitations to using PE ratios, even when comparing publicly traded companies. Despite these limitations, we will quickly connect the market approach of using a PE ratio to the income approach of using a capitalization of earnings method for those who may not be intimately familiar with the relationship. See Exhibit 4.7.

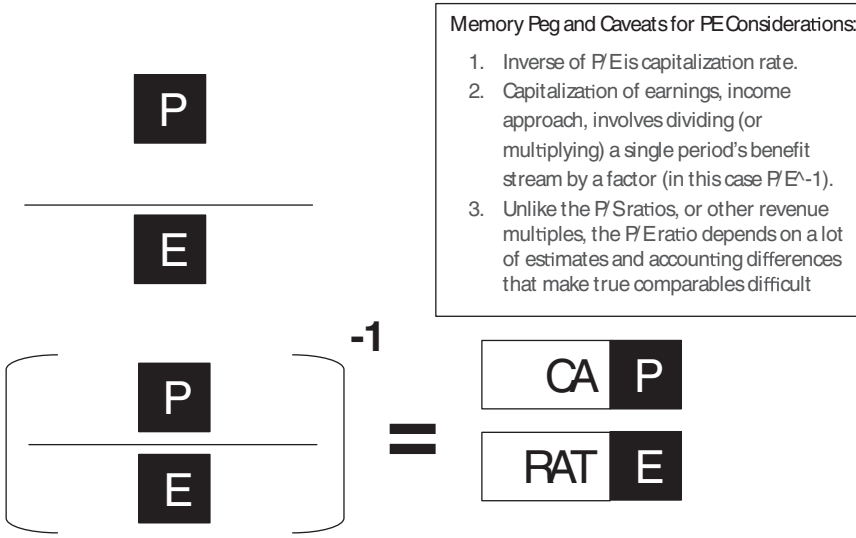


EXHIBIT 4.7 Price Earnings Multiples Considerations Mnemonic
Source: Liquid Scenarios, Inc.

Ironically, while the limitations of multiples for publicly traded company analysis are critical to value conclusions, for most venture-funded companies, those limitations don't impact conclusions materially. This is because the vast majority of venture-funded companies at any time are so far away from generating meaningful earnings that by the time PE ratios are material, expected returns for the broader market and the industry will have likely changed. As a result, the difficulty with venture-funded companies is projecting the future financial parameter against which to apply the multiple. In general, the further away the estimate is from the bottom line, or earnings, the more likely it will serve as a reliable basis for estimating a potential terminal value. Exhibit 4.8 illustrates this concept.

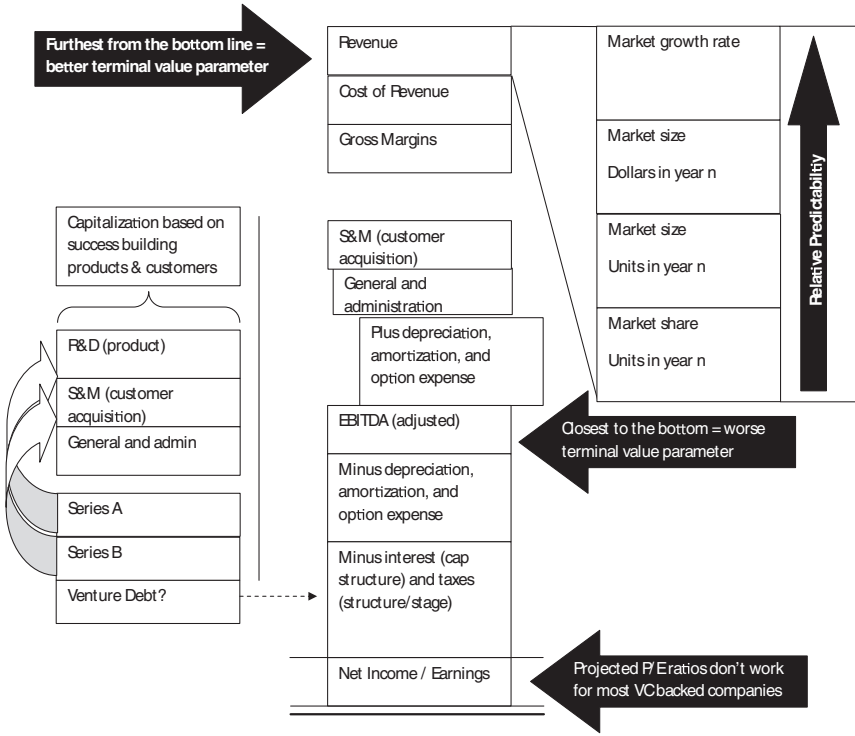


EXHIBIT 4.8 Hierarchy of VC-Backed Company Multiples Far Away from Earnings
Source: Liquid Scenarios, Inc.

Who's Valuing What?

As we've mentioned, different types of investors value high-growth venture-backed companies differently. This is completely rational, since there's often a lack of visibility into entity earnings and operating cash flow when angels and venture capitalists invest, as opposed to when private equity and underwriters are looking at a high-growth company. Referring back to our investment return perspective diagram, reproduced below, you can see that if an early-stage venture investor really had to look explicitly at an investee's free cash flow potential in order to make an investment, very few venture financings would take place.

So, for instance, assume that in period 0, today (P0), an angel investor puts $500,000 into a company knowing that 100% of that investment will be consumed by negative operating cash flow. The angel is counting on, or hoping, that VCs will come in with an investment of $6MM within one year or so (P1), knowing that their entire investment will be consumed by negative cash flow. This pattern continues until period 5, when the company generates only $1,000,000 in negative cash flow, putting break-even cash flow within reach of the company. What's the value of the company in each period?

There are several obvious constraints to applying a discounted cash flow to this scenario. If you use the expected return rate for a venture capitalist as the basis for your discount rate, you actually end up overvaluing the cash flows, since the higher the discount rate, the lower the present value, and

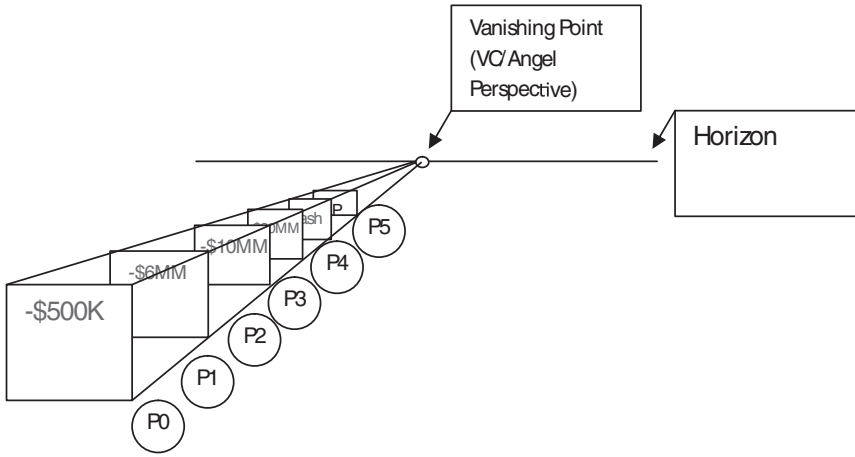


EXHIBIT 4.9 Foreseeable Horizon and Discrete Discounted Cash Flows
Source: Liquid Scenarios, Inc.

the overwhelming majority of free cash flow here is negative. Exhibit 4.10 illustrates this by applying several discount rates to the cash flows described for the hypothetical venture-backed company.

Without intensive examination, it's clear that simply applying our required rate of return to the free cash flows (FCF), we can reasonably generate incorrect conclusions as to the relative acceptability of the investment. That being said, any discount rate we apply results in a negative present value of our investment. Of course, discounting the projected cash flows would only be part of our DCF analysis. The other part would be to estimate a terminal value, or value beyond the point we can reasonably project cash flows. Remember, we assumed that the company could potentially breakeven in period 6, and you can't apply a growth rate to zero. Naturally, there are modifications valuation professionals take into account to address this, but the point is clear. Even if we were to assume a positive free cash flow of $500,000 per year in perpetuity from that point forward, we still end up with a negative present value, as illustrated in Exhibit 4.11.

Obviously, VCs and angels are smart people, so if they were valuing cash flows this way, they wouldn't be making investments in early-stage companies. Also, the method we used, capitalizing earnings to get to terminal value, is not appropriate for these types of companies because they are expected to generate incredible earnings growth ultimately, as opposed to stable growth comparable to the overall economy. With that in mind, let's try to use a more appropriate means of estimating terminal value for these types of companies, such as a multiple of revenue, a market approach to valuation, but, as we discussed earlier, a great way to get a terminal value for a high-growth company.

Market Approaches for Estimating Terminal Value

Within the market approach to valuation, there are a number of methods that use capitalization rates/ratios and/or multiples that are convenient to use to quickly get an indication of a company's value. The three most popular market approaches you will see with respect to a venture-backed company are:

1. Looking at public companies that are "comparable" and comparing their multiples/ratios to the company being valued.
   a. When most people think about valuation, this is the first thing that comes to mind, because it's the most intuitive way to get an idea, or indication, of value.
   b. Getting comps from publicly traded company valuation metrics is often referred to as the "Guideline Company Method."

		Period					
		0	1	2	3	4	5
Discount Rate	Projected FCF	$(500,000.00)	$(6,000,000.00)	$(10,000,000.00)	$(8,000,000.00)	$(2,000,000.00)	$(500,000.00)
	Sum of PVs						
3%	$(25,280,613.57)	$(500,000.00)	$(5,825,242.72)	$(9,425,959.09)	$(7,321,133.27)	$(1,776,974.10)	$(431,304.39)
10%	$(21,906,014.24)	$(500,000.00)	$(5,454,545.45)	$(8,264,462.81)	$(6,010,518.41)	$(1,366,026.91)	$(310,460.66)
12%	$(21,078,073.20)	$(500,000.00)	$(5,357,142.86)	$(7,971,938.78)	$(5,694,241.98)	$(1,271,036.16)	$(283,713.43)
15%	$(19,931,052.70)	$(500,000.00)	$(5,217,391.30)	$(7,561,436.67)	$(5,260,129.86)	$(1,143,506.49)	$(248,588.37)
20%	$(18,239,519.03)	$(500,000.00)	$(5,000,000.00)	$(6,944,444.44)	$(4,629,629.63)	$(964,506.17)	$(200,938.79)
25%	$(16,779,040.00)	$(500,000.00)	$(4,800,000.00)	$(6,400,000.00)	$(4,096,000.00)	$(819,200.00)	$(163,840.00)
30%	$(15,508,793.59)	$(500,000.00)	$(4,615,384.62)	$(5,917,159.76)	$(3,641,329.09)	$(700,255.59)	$(134,664.54)
40%	$(13,416,790.62)	$(500,000.00)	$(4,285,714.29)	$(5,102,040.82)	$(2,915,451.90)	$(520,616.41)	$(92,967.22)
50%	$(11,775,720.16)	$(500,000.00)	$(4,000,000.00)	$(4,444,444.44)	$(2,370,370.37)	$(395,061.73)	$(65,843.62)
60%	$(10,462,234.50)	$(500,000.00)	$(3,750,000.00)	$(3,906,250.00)	$(1,953,125.00)	$(305,175.78)	$(47,683.72)
70%	$(9,392,627.92)	$(500,000.00)	$(3,529,411.76)	$(3,460,207.61)	$(1,628,332.99)	$(239,460.73)	$(35,214.81)
80%	$(8,508,476.01)	$(500,000.00)	$(3,333,333.33)	$(3,086,419.75)	$(1,371,742.11)	$(190,519.74)	$(26,461.07)

EXHIBIT 4.10 Impact of Discounting a Series of Negative Cash Flows

				Projected FCF Period 6
				500000
Discount Rate	PV + TV	Sum of PVs	PV of Terminal Value	Terminal Value
3%	$(11,322,542.63)	$(25,280,613.57)	$13,958,070.94	$16,666,666.67
10%	$(19,083,644.59)	$(21,906,014.24)	$2,822,369.65	$5,000,000.00
12%	$(18,967,110.19)	$(21,078,073.20)	$2,110,963.00	$4,166,666.67
15%	$(18,489,960.71)	$(19,931,052.70)	$1,441,091.99	$3,333,333.33
20%	$(17,402,274.09)	$(18,239,519.03)	$837,244.94	$2,500,000.00
25%	$(16,254,752.00)	$(16,779,040.00)	$524,288.00	$2,000,000.00
30%	$(15,163,499.91)	$(15,508,793.59)	$345,293.69	$1,666,666.67
40%	$(13,250,777.74)	$(13,416,790.62)	$166,012.89	$1,250,000.00
50%	$(11,687,928.67)	$(11,775,720.16)	$87,791.50	$1,000,000.00
60%	$(10,412,563.96)	$(10,462,234.50)	$49,670.54	$833,333.33
70%	$(9,363,035.64)	$(9,392,627.92)	$29,592.28	$714,285.71
80%	$(8,490,100.27)	$(8,508,476.01)	$18,375.75	$625,000.00

EXHIBIT 4.11 Too Little Operating Cash Flow Too Late and DCF Still Breaks

2. Looking at sales of similar private companies that have been acquired and comparing some metric of those transactions to the company being valued.
   a. For traditional private companies, the metrics are generally things such as revenue multiples, discretionary earnings multiples, PE multiples, or other financial ratios. Getting comps from actual sales of private companies is often referred to as the "Guideline Transactions Method." The AICPA's Practice Aid describes the "Backsolve Method" as a "version of the Guideline Transactions Method." I don't believe that's an accurate description, since guideline transactions always involve someone else's shares versus sales of the subject company's own shares, which are used for the Backsolve method.
   b. For many Internet-related companies, revenue and earnings multiples are not available for recent private transactions, so other metrics are used. For instance, if one company has recently sold at "$60 per user," multiplying the subject company's users by the same number gives an indication of the range management might have in mind with respect to current valuation.
   c. Alternatively, in the life science space, recent licensing deals are of importance, in addition to recent acquisitions, as licensing deals are often publicized, are accessible, and also give an indication of value for the firm in conjunction with a "sum of the parts" approach.

3. Looking at recent sales of the subject company's stock, including both primary and secondary sales.
   a. This remains the most common method used in practice by venture capitalists, angel investors, and founders of venture-backed companies, largely because it tends to be the most frequent indication of value for these companies.
   b. The vast majority of 409A valuations either rely directly or indirectly on reverse solving, or backsolving, for total equity values that generate preferred values per share that agree with the most recent round of venture financing. This is another example of considering recent sales (primary or secondary) of the company's securities as a market approach input.

In mature industries where there are many comparables, or "comps," to choose from, valuation professionals will narrow their selection based on selection criteria such as the company size, the age of the transaction if applicable, the product focus, and a host of other parameters needed to group only the best match of candidates. Regression analysis and other statistical tests are then run on the list to make sure that potential parameters, such as price to sales, or price to earnings for instance, are correlated to transaction values across the companies selected. This includes, in part, a basic technique very similar to what is used to calculate a Beta. If the covariance is being thrown off by a given company, that candidate will be removed from the list of comparables, or at least removed with respect to the offending metric.

If venture-funded companies had a comparably large group of comps to choose from, that might make market approaches to valuations for those companies easier, but it would also mean that the market was saturated with publicly traded competitors, which of course could lead to very bad consequences for leading-edge companies. As you might expect, the list of true comparables for the most promising venture-backed companies tends to be quite small in most cases, and as a result, compromises have to be made with respect to both quantity of data and the statistical rigor it's subjected to. Despite these limitations, a very often mentioned valuation method associated with venture-capital investors is the so-called "venture capital" or "Chicago" method, which does in theory look to price earnings ratios to determine present and future values of a prospective venture investment.

Do VCs Actually Use the "VC Method" of Valuation?

The so-called "VC method" or "Chicago" method of valuation, as described by academics, is rarely used formally by investing partners at early-stage venture-capital firms. In fact, from what I've observed, it's rarely even used

by the analysts at those firms if at all. However, for later-stage venture-capital funds, such an analysis, along with many of the other valuation methods we've discussed, could yield meaningful results. Also, if an early-stage investor happens along the rare high-growth company that's (a) already profitable or about to become profitable and (b) hasn't received any venture financing to date, that's also a great time to apply the VC method and the other valuation methods discussed, such as a DCF model.

With "No Free Cash Flow to Discount," What Are VCs Valuing?

Other than looking at the people involved in the ventures (the founders) and the size of the market opportunity, the next thing on the horizon is the prospects for getting other investors to participate in subsequent rounds of financing. It's those subsequent rounds of financing that will have the biggest impact on how company progress, and therefore valuation, is measured objectively by the market participants (primarily other VCs).

Since late 2006 I tried to convince valuation professionals that their models were more sensitive to future financing rounds for venture-backed companies then those models were to volatility rates, discount rates, or even the anticipated time until a liquidity event. In early 2007 some of those valuation professionals agreed and started including future financing rounds in their calculations. Some even wrote about it and set firm policy around the practice of doing so.

Unfortunately, some of those same professionals ended up paying the price for doing so, since the auditors of the venture-backed companies were relying on authoritative literature that didn't take into account future financing rounds. This meant that valuators had to eat the cost of explaining what they did to auditors and couldn't bill their clients for it.

Many of the valuation teams at audit firms were comfortable with income- and market-based approaches to valuation that emphasized future entity earnings or operating cash flows as a required input. Everyone knows that these methods involve a lot of assumptions for even the most established corporations. However, most venture-backed companies are extremely speculative, since few paying customers exist in many cases, business models change quickly in others, and the competitive realities of approaching a new market with a new product or service result in too many variables to get accurate inputs for in a timely manner.

On the other hand, everyone that's involved in founding or investing in a venture-backed company has some idea of what the financing prospects for that company are from period to period and some idea of what the cash requirements will be from period to period. These two factors, the most

reliable and attainable, are also the most reliable inputs into any model for most venture-capital investments. Since the valuation teams at audit firms have become a little more familiar with this reality, and collectively more experienced with these engagements, modeling future rounds of financing has become increasingly accepted in the space.

ACTUAL DIFFERENCES BETWEEN ANGELS AND VCs VERSUS PERCEIVED DIFFERENCES

Angels have long been accused of overvaluing companies. Similarly, VCs have long been accused of, for lack of a better word, "screwing" angel investors. In reality, there are clearly enough cases of both things occurring to justify the existence of these stereotypes. However, there's far more evidence that these parties depend on one another for success in most cases. As a result, it's very important to understand differences in how these parties approach valuing their investments, valuing the companies they invest in, and how their formal and informal rewards systems work. The following attempts to highlight some of the important differences that I've observed as impacting the perspective of most VCs and versus the valuation perspective of most angels.

Let's say an active angel investor with 30 portfolio companies says, "My investment is worth nothing until it sells." The next question might be, then, what happens if the next round is at a very high valuation? The investor says, "It's still worth nothing, but maybe a little more than nothing."

When a VC looks at a deal, the firm, and the individual looking at the deal are being compensated no matter what the outcome. How? Well, the firm is of course charging a management fee to the limited partners (LPs) every year based on the committed capital. If the firm has $500MM under management, than there's typically $10MM per year in fees to divide across partner compensation (salaries) and other administrative expenses of the fund annually. Even if every partner is taking a close look at 100 prospective deals a year, that's $X per deal just for looking. Naturally, these partners want to find the best deals available. But regardless of whether that happens, they will receive actual cash compensation for every deal they take a look at in a given year.

This is in stark contrast to an angel investor that is not associated with a professional fund and hasn't organized his or her fund as such. When an angel looks at a deal, not only does he or she not receive cash compensation, he or she also incurs very real cash expenses: travel, meals, time away from family without cash compensation to make up for it, early due diligence

costs, and so forth. So the personal IRR and cash-on-cash for an investing partner at a VC fund is positive when he or she looks at a deal; whereas the personal IRR and cash-on-cash return for an angel is immediately negative. Ironically, this is one of the undocumented areas where the so called "J-curve" really does apply on a cash basis.

Is this alone enough to make a difference in the perceived value of an opportunity? Absolutely. Does that mean that that perception of value ends up finding its way into deal terms, and therefore how securities are priced? Sometimes it does, of course. When you are playing with your own money, your own time, and your family's time (without compensation) at the earliest stages of a venture, most people tend to make decisions differently. One analog might be the differences between entrepreneurs that bootstrapped through the seed and early stages, getting financing only after they achieve meaningful sales traction or technical feasibility, and those that get F&F financing from inception, angel financing at the seed stage, and VC funding for the B and C rounds. The latter model is more likely to efficiently weed out ventures that shouldn't make it to the next stage. However, the former model may ensure that the lessons learned evolve into something that's of greater value to society. The prevalence of Internet-related investments, which tend to be more scalable in both directions than life science and green technology investments, tends to make 100% bootstrapping, 100% angel investors, 100% venture-capital financing, and mixes of each realistic financing alternatives. But with the longer cycles for regulatory approval and testing in life sciences, sometimes bootstrapping is not an option.

These financing realities are reflected in most of the discounted cash flow models you will see in 409A valuation reports, which tend to go out three to five years for venture-backed companies. However, in the case of life science companies, which have to first overcome regulated technical hurdles that generally take much longer than three to five years, a 20-year cash flow model composed of various phases would not be unreasonable. But considering that most venture-capital funds have lives of 10 years, a 20-year cash flow model can quickly become impractical. For these reasons, and many others, the typical DCF model simply doesn't work well with most venture-funded companies until they are about to transition to public companies, be acquired by a public company, or otherwise start generating meaningful operating cash flows. That being said, there are still benefit streams that have to be discounted, or brought to a present value. To do so, an understanding of the relationships between valuation methods and allocation methods is helpful at every stage of a venture-backed or angel-backed company's evolution.

APPLYING VALUATION METHODS AND ALLOCATION METHODS AT INCEPTION

"The value of an idea lies in the using of it."

—Thomas A. Edison

When you first start a promising company and issue stock, what's it worth? In most cases, the answer, according to accounting records, is the par value of the stock. This practice is largely driven by tax rules and conventions followed by attorneys and accountants familiar with the potentially negative tax consequences to founders that don't follow popular methods for assigning a nominal value to their shares early in the company's life. While there is of course lots of theoretical support for this practice, it's also good for founders and others to understand different ways at looking at the value that's created early in a startup's life.

In almost every case in this book you will see the same pattern:

1. One or two founders start the company and divide the shares (percentage ownership) between one another.
   a. Either additional team members come on prior to funding (and get some restricted stock) or
   b. The company obtains either seed money or a Series A round
2. The founders' shares, common stock, issued in 1 are issued at a par value (often $0.001 per share).
3. The Series A, or some seed round, is issued for 100 times to 1,000 times the nominal (par) value assigned to the founders' shares.

   So, for instance, in the Zogenix case, the Series A shares were sold for $1.00 per share to the outside investors. The common stock was issued to the founders for $0.001 per share, or 1/1,000th of what the outside investors paid.
4. When the first outside money comes in, or in some cases prior to the first round, the founders execute a restricted stock purchase agreement that provides for reverse vesting (repurchase) of the shares they were issued.
   a. This has the advantage of keeping a founder who quits early in the process from reaping the rewards for doing no work in the future.
   b. It also has the advantage of giving outside investors and board members a means of invoking management levers that aren't always available when founders control the company.
5. As a result of the lower value, and by filing an 83(b) election within 30 days of getting their stock, the founders in the Zogenix case might pay $30K in taxes today versus a virtually unlimited amount in the future as the shares reverse vest at increasing values.

So, for example, if the fair value of the shares was determined to be $1.00 in a year later when one-third vested, the founders could suddenly have a tax bill of around $1.2 million, for instance. If the company goes out of business the following year, the founders will have lost $1.2 million to the government for no reason, in addition to losing their dream for a successful venture.

With this convention being so practical and prominent, efforts to value the shares at this early stage are rarely done formally. Instead, founders often think, "If the company gets a pre-money value of $10MM and I own 30%, I just made $3MM." Indeed, there's a famous quote from a *Business Week* article on DIGG that makes use of this approach, which is surprisingly accurate in certain cases. In the end, you can't know the value until you apply a reasonable method or until someone buys the stock (or the company) from you.

As a result, we're going to apply some of the valuation methods and allocation techniques introduced thus far to earlier stages of the company's life. We'll be using the same methods Zogenix used as it got closer to an IPO, but doing so long before the management or the investors in the company would have been applying these techniques.

Valuation in the Beginning

In this example, the basic idea of the opportunity is threefold:

- Acquire world's first needle-free injection system for pennies on the dollar.
- Combine it with an existing pain drug that has FDA approval and a huge installed base of prescribing physicians to get to market faster than a traditional drug.
- Raise $60 million in capital over four years to bring the first drug to a market that currently spends $12 billion per year on just one indication addressed by the technology.

Next, we think about the value of each of these parts of the basic idea:

- Zero, it's just an idea and ideas aren't worth anything until you execute on them.
- Apply the "financial hammer" $(1 + r)^{-t}$ to the net cash flows to equity investors projected (C), where r represents a required rate of return and t represents the number of periods (years) required to realize that return and C equals the net cash flow you will realize in t years.
- There's not enough information to answer this question.

EXHIBIT 4.12 Zogenix Founder Common Stock Startup Allocations

Name	Shares	%
Stephen J. Farr	3,000,000	28%
Jonathan M. Rigby	1,500,000	14%
John J. Turanin	1,500,000	14%
Roger Hawley	2,100,000	20%
Cam L. Garner	1,850,000	17%
Bret Megargel	800,000	7%
Total Founders	10,750,000	100%

So, what is the answer? The answer is always C*(1+r)^–t, even if you believe that ideas aren't worth anything until you execute on them (answer A) or if you feel there's not enough information to answer the question (answer C). Here's why (or, the method behind the answer) . . .

Everyone has to make assumptions with any early-stage deal. Usually the first thing you hear about is in fact the idea, even if the trigger for making a decision to invest time or money into a company is "who are the founders?" (See Exhibit 4.12.) That being said, there's an implicit value to every idea. It may be less than zero and it may be greater than zero, but it is almost never worth exactly $0.

Similarly, although we might like to have more information to make a decision, there's enough information here to easily place a potential value on the idea alone. If we feel there's that more information is needed, we can make r, the required rate of return, higher to reflect the uncertainty. Once we get the facts, we can lower r, assuming the additional information supports the facts as described by the founders.

In this particular case, the fact that the founders are going after a huge market, in a highly regulated industry, with existing products actually makes it easy to test their assumptions regarding the cost, market opportunity, and timing of cash flows being realized. If those assumptions prove true, the idea alone is worth something greater than $0 in this case, even if we assume this is not the best team to execute on that idea.

SUMMARY

In this chapter we've touched upon why traditional discounted cash flow models that would be perfectly suited for private companies in mature industries are rarely appropriate for early-stage venture-backed companies.

Widely used tools, such as the Gordon Growth Model, while not well suited to explicit use for venture-backed company discounted cash flow models, were shown to be useful ways of quickly depicting and grasping the impact of growth on value. We also started to explore the interrelated roles that allocations of rights, values, and proceeds play on value indications and conclusions.

Chapter 5 dives deeper into the current practices concerning enterprise values and allocations of venture capital-backed company values to different classes of securities. It goes on to show how these current practices may be destroying value for some of the most important contributors to venture capital returns.