How to Value
a Start-up

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Valuing Seed Stage Start-Ups: A Primer for High Net Worth Individuals

In theory, start-up valuation is similar to the valuation of any company. First, estimate the amount of money the company will make for its shareholders (typically through an acquisition or IPO). Second, approximate your future ownership and position in the company's capital structure when that liquidation event happens. Third, calculate required return with respect to your personal objectives and constraints. Fourth, discount the company's expected future value by step three. Fifth, compare the opportunity to your alternatives.

In practice, however, start-up valuation is extremely difficult. Even public companies with 10 years of operations, steady dividends, and consistent revenue growth are subject to myriad macro and microeconomic risks that render their future uncertain. Start-ups, much smaller in stature and track record, are inherently more volatile, data-poor, and unpredictable relative to your typical publicly traded company.

The shrewd start-up investor combines knowledge, experience, analysis, and intuition to estimate the likelihood that a company will succeed across a range of economic scenarios and then evaluates the financial potential of the opportunity to determine the maximum price he/she is willing to pay for the company's equity. However, in light of limited data and information to predict the future, **start-up valuation remains more of an art than a science.** Below we provide our own start-up valuation framework based on traditional valuation methodologies with some adjustments to the asset class.

STEP 1 Estimating Future Value and Time Horizon

Although the logic behind certain start-up valuations seems shrouded in mystery, the price investors ultimately pay is a function of supply and demand. When a proven team with impressive traction fundraises, oversupply of capital will place upward pressure on valuation, whereas an inexperienced team with no traction will face the opposite. As start-up investors, we will sometimes be presented with opportunities that have already been priced, in which case our job will be to develop and evaluate against our own price range. In other situations, we may make an offer or "lead" a round which requires a process of negotiation with the entrepreneurs against our internal price range. Either way, the analytical process around the valuation is the same.

We start out by creating a model to analyze our future expectations of the company. Given the broad range of outcomes, we typically come up with 4 or more potential scenarios and assign a likelihood to them based on our assumptions about industry growth, business milestones, expected capital raises, regulatory considerations, traction, buyer universe, business and product development, the competitive landscape and execution of the team. Obviously no two analysts will arrive at the same conclusion but the significance of this exercise is to form a thesis on what we think we could potentially make from each opportunity. Below is an illustrative example with an imaginary SaaS company named TechCo.

Bull Case: TechCo executes on first mover advantage, reaches $150m in annual revenue, Microsoft and Salesforce become strategic partners, and the company IPOs for $1bn. Probability: 10%. Time Horizon: 10 years.

Base Case: TechCo builds a trusted brand, generates $50m in annual revenue, annoys Microsoft or Salesforce enough that they buy the company for $200m. Probability: 20%. Time Horizon: 8 years.

Bear Case: The company falls short of its customer and revenue milestones sells its technology and/or team to a strategic buyer for $20m. Probability: 30%. Time Horizon: 6 years.

Null Case: The company fails to execute and ultimately closes, resulting in a write-off. Probability: 40%. Time Horizon: 4 years.

We can now calculate our investment's expected future value, depicted in the table below.

Scenario	Revenue at time of exit	Revenue Multiple	Exit Valuation (V)	Probability (P)	Expected Future Value (V*P)	Time Horizon (Y)	Expected Time Horizon (Y*P)
Bull Case	US$ 200mm	6.7x	US$1bn	10%	US$100m	10	1
Base Case	US$ 50m	4x	US$200m	20%	US$40m	8	1.6
Bear Case	US$ 10m	2x	US$20m	30%	US$6m	6	1.8
Null Case	US$ 0mm	N/A	US $0m	40%	US$0m	4	1.6

Now sum the Exit Value and Expected Time Horizon columns to calculate **Step 1.**

$100m+$40m+$6m+$0m= **$146m**

1+1.6+1.8+1.6= **6.0 years**

STEP 2 Estimating Future Ownership and Priority of Claims

When a company raises a new round, it must issue new equity shares in exchange for capital. The issuance of new shares reduces, or dilutes, the ownership of existing shareholders. Typically, the larger a company grows, the more shares it must issue, leading to further dilution. Given the material effect dilution has on returns, we analyze the fundraising requirements and expectations for each investment case and calculate the weighted average.

Scenario	Exit Valuation (V)	Probability (P)	Expected Dilution (D)	Expected Future Value with Dilution (V*P*(1-D))
Bull Case	US$1bn	10%	60%	US$40m
Base Case	US$200m	20%	50%	US$20m
Bear Case	US$20m	30%	17%	US$5m
Null Case	US $0m	40%	N/A	US$0m

Thus, we incorporate expected dilution into our future value calculation for **Step 2.**
$40m+$20m+$5m+$0m= **$65m**

Dilution: Not Necessarily a Bad Thing

Imagine a company has 400,000 shares outstanding, all of which are owned by the founders, and each share is worth $10. The pre-money valuation of the company is thus $4m (shares outstanding * PPS). Let's say you want to buy 20% of the company. The company agrees to issue and sell you 100,000 new shares at $10/share ($1m), creating a total of 500,000 shares outstanding. You now own 20% of the company, (your shares/shares outstanding), the company has a new investment of $1m, and a post-money valuation of $5m.

	Pre-Money Valuation	Shares	Price Per Share (PPS)	Ownership	Post-Money Valuation	Shares	Ownership	Price Per Share (PPS)
Founders	$4m	400,000	$10	100%	$4m	400,000	80%	$10
You	$0m	0	-	0%	$1m	100,000	20%	$10
Total	$4m	400,000	$10	100%	$5m	500,000	100%	$10

Two years later, the company engages with a new investor who believes the company is worth $10m (pre-money valuation), or $20/share. Let's say this investor also wants to buy 20% of the company. This time the company issues and sells 125,000 new shares at $20/share ($2.5m), creating a total of 625,000 shares outstanding. This investor now owns 20% of the company (his shares/shares outstanding), the company has a new investment of $2.5m, and a post-money valuation of $12.5m.

Pre-Series A

	Shares	Ownership	Price Per Share (PPS)	Post-Money Valuation
Founders	400,000	80%	$20	$8m
You	100,000	20%	$20	$2m
Total	500,000	100%	$20	$10m

Post-Series A

	Shares	Ownership	Price Per Share (PPS)	Post-Money Valuation
Founders	400,000	64%	$20	$8m
You	100,000	16%	$20	$2m
Investor	125,000	20%	$20	$2.5m
Total	625,000	100%	$20	$12.5m

As evidenced by the two tables above, although your ownership was diluted from 20% to 16%, the value of your shares increased from $1m to $2m.

The analysis should account for the business projections in light of the expected capital raise of the round.

Where Do You Sit in the Capital Stack?

As a company grows and issues new classes of shares and/or debt, the ownership structure can become complex and impact your returns. Just like public companies, debtholders will receive their principal and outstanding interest before any equity holder receives a distribution from the proceeds of a sale. Once the debtholders are made whole, each equity holder is paid based on his/her liquidation preference. In technology companies, it is not uncommon for subsequent classes of shares to have a preference over previous classes resulting in a "last in first out" distribution upon liquidation.

Liquidation preferences in start-ups typically come in three flavors; participating preferred, non-participating preferred, and capped participating preferred, discussed at length by Brad Feld and Fred Wilson. The mathematical exercise used to model distributions under different liquidation scenarios is known as a liquidation or waterfall analysis, which factors in all liquidation preferences to model expected return in each scenario.

STEP 3 Required Return

The way we think about required return on an individual angel investment starts at the portfolio level. In constructing a start-up investment portfolio, our official recommendation is to invest in at least 20 companies over time and reserve approximately 50% of total allocated amount to follow on rounds. To learn more about portfolio management in angel investing, click here.

With this in mind, let's say you expect a 3x portfolio return over 10 years, or 20% IRR assuming an average investment duration of 6 years. To account for the high failure rate in the asset class, we believe each individual investment in your portfolio must have two things:

1. The potential to yield a future value that could cover the entire investment amount of your start-up portfolio (typically represented in the bull case of the scenario analysis). Rationale: Because the performance of your overall start-up portfolio relies heavily on the investment outcome of outliers, each individual company in your portfolio should have the potential to be an outlier. To illustrate, if you correctly analyzed that each investment has at least a 10% probability of making a 10x return, than 1 out of 10 investments should realize at least a 10x return. If you don't have at least 10 companies in your portfolio with this potential, the likelihood that none of your companies achieves its bull case is higher.

2. An expected IRR that exceeds your desired portfolio IRR. Rationale: If you expect each start-up investment to independently return a 20% IRR, the IRR of your total portfolio should be 20% right? Wrong actually. In practice, our estimates tend to be more optimistic than reality and often times, we tend to over estimate revenue projections and time horizons, and underestimate expenses and dilution. Even if you are an experienced analyst, if you invested at valuations reflecting a 25% expected IRR on each individual investment, you would be lucky to have a portfolio return of 15%. Depending on the stage of the start-up and risk level, we typically look for an expected IRR of ~50-60% on our earlier stage investments and around 30-40% on our later stage and follow on investments. Then based on our investments size, we go back to verify that the resulting price also meets the first condition of a potential to be an outlier.

Going back to our example, let's assume our required rate of return for TechCo is 50%.

STEP 4 Putting it all together

After we have compiled all the variables in the analysis above, we can calculate a maximum price for the investment opportunity.

Step 1= $146m and 6-year time horizon
Step 2= $65m after accounting for dilution
Step 3= 50% required rate of return

Calculation: $65m/(1.50)^6 = **$5.7m post-money valuation.**

While this exercise is based on many assumptions, it provides us with a framework to evaluate the opportunity in TechCo's.

STEP 5 Comparing the opportunity to alternatives

With the acceleration of technology start-ups in the last decade, we are now faced with an ever-increasing number of choices. In fact, many professional angel investors and VCs including us at iAngels see 1,000+ investment opportunities a year. So, even if you do manage to come up with what you believe represents a fair price for a given start-up company, it doesn't necessarily mean you will want to invest in every fairly priced start-up. In which case, how do you choose?

With limited investment capital, you want to select deals that will yield the highest risk reward potential relative to the deal universe at any given time. This desire necessitates a tool that helps evaluate opportunity cost and benchmarks each investment opportunity to its peers. The most common tool we see in high tech is the scorecard approach, which scores a potential opportunity based on success factors according to the investor's preferences and investment philosophy. See an example below as a reference point.

Success Factors	Weight	Ranking
Team	30%	9
Market Opportunity	20%	8
Technology	20%	10
Competitive Landscape	10%	8
Business Model	10%	8
Deal Terms	5%	9
Other	5%	8
Total	**100%**	**8.75**

Conclusion

Given the uncertainty and variability inherent in start-up investing, valuation will always remain an art form. However, analyzing investments thoughtfully creates an advantage when it comes to selecting the right deals. While professionals don't necessarily work through the entire exercise for every investment opportunity, the valuation technique outlined above forces us to think through critical issues that ultimately increase our chances of paying the right price for our portfolio companies.