

Startup Valuation

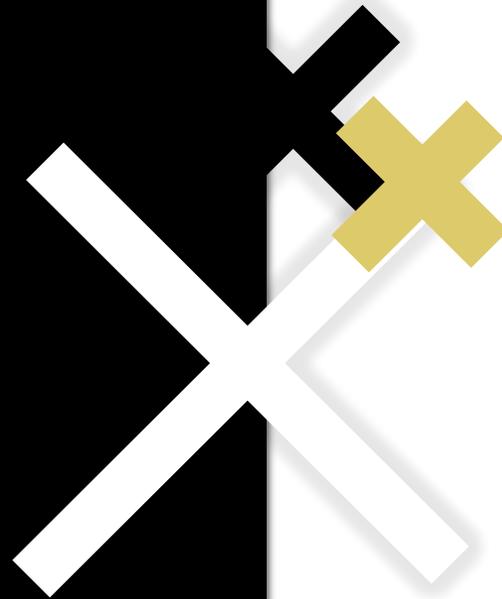


Essentials



Mac AI
Ventures

Why You Need a Valuation



When selling equity, the investor trades cash for a percentage ownership of the startup corporation.

Determining the percentage of equity the investor's cash buys him/her of the total value of the startup needs to be agreed on before the investment occurs.

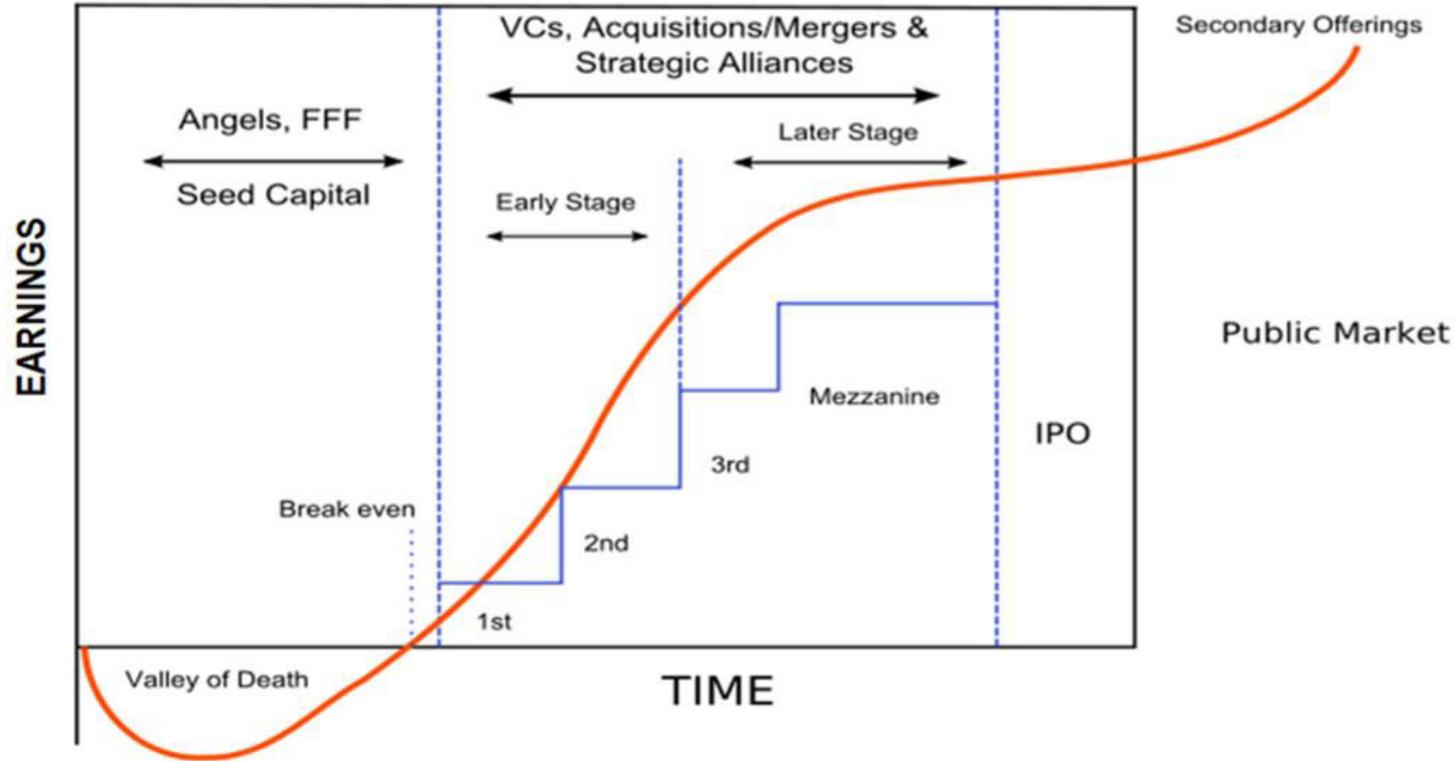


Key Terms / Metrics

- ✘ **Pre-money Valuation (PRM)** - how much your Startup is worth before an investment
- ✘ **Post-money Valuation (POM)** - how much the Startup is worth after an investment
- ✘ **Dilution** - is the decrease in existing shareholders' ownership percentage of a company as a result of the company issuing new equity
- ✘ **Return on Investment (ROI)** - the benefit an investor will receive in relation to their investment cost. It is commonly measured as net income divided by the original capital cost of the investment
- ✘ **Revenue Return Rate (ROR)** - a measure of company profitability based on the amount of revenue generated, comparing the amount of net income generated for each dollar of revenue



Startup Financial Life Cycle



| | | | |
|--------------------------|----------------------|-----------------------------|--|
| Operating History | None | Very Limited | Operating history can be used in valuation |
| Comparables | None | Some | Large number of comparables, all at different stages |
| Source of Value | <u>Future Growth</u> | <u>Mostly Future Growth</u> | <u>Position from existing assets, growth still dominates</u> |





A Good Valuation Utilizes Multiple Methods

Qualitative Approach

- 1| The Scorecard Method
- 2| The Checklist Method
- 3| Asset Based Approach
(cost to duplicate)

Quantitative Approach

- 4| Discounted Cash Flow (DCF)
- 5| First Chicago Method
- 6| Venture Capital Method





The Scorecard Method

Compares Startups to Already Funded Companies

Factors:

- ❖ Quality of the Idea
- ❖ Strength of the Management Team
 - ❖ Product Roll-Out or Sales
 - ❖ Strategic Relationships
 - ❖ Product and Technology

Steps:

1. Finding the Average Pre-Money Valuation
2. Determining the Individual Weighted Averages
3. Assigning Comparison Factors to the Percentage Weights
4. Multiplying the Sum of the Factors



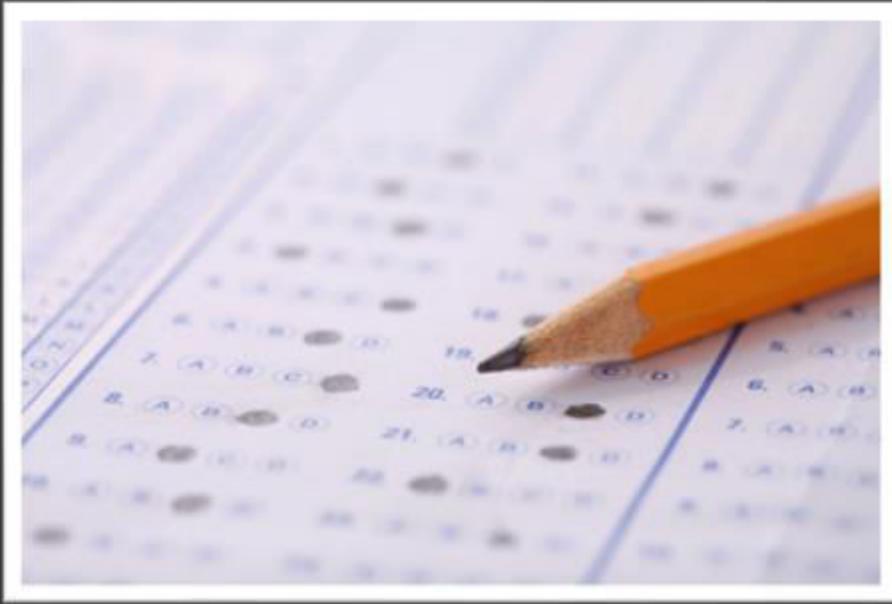
EXAMPLE

The founding team all participated in startups before – give a score of 125%

| Characteristics | Weight % | Comparison % (Target Company) | Factor = (WxC) |
|-----------------------------------|----------|----------------------------------|----------------|
| Strength of Entrepreneur and Team | 30% max | 125% | 0.3750 |
| Size of the Opportunity | 25% max | 80% | 0.2000 |
| Product/Technology | 15% max | 100% | 0.1500 |
| Competitive Environment | 10% max | 60% | 0.0600 |
| Marketing/Sales/Partnerships | 10% max | 90% | 0.0900 |
| Need for Additional Investment | 10% max | 60% | 0.0600 |
| Total Sum of Factors | | | 0.935 |

$$\text{Business Value} = \text{Sum of Factors } [0.935] \times \text{Pre-money valuation } [\$800,000] = \$748,000$$





The Checklist Method

Has fixed value amounts attached to each element

Factors:

- ❖ Quality of the Idea
- ❖ Strength of the Management Team
- ❖ Product Roll-Out & Protection
- ❖ Strategic Relationships
- ❖ Operating Stage

A scale is applied rating each of the factors at up to \$500,000. This value can change dependent on how many factors you decide to use in your assessment. However, it should be consistent with the factors you chose from the comparable.



EXAMPLE

The sum of the values of each element becomes the business valuation

| Characteristic | Factor % | Score | Max Val. | Value (FxSx0.5m) |
|----------------------------|----------|-------|----------|---|
| Quality of Management Team | 24% | 100% | \$0.5m | $24\% \times 100\% \times 0.5m = 120,000$ |
| Sound Idea | 20% | 80% | \$0.5m | $20\% \times 80\% \times 0.5m = 80,000$ |
| Product/Technology | 12% | 100% | \$0.5m | $12\% \times 100\% \times 0.5m = 60,000$ |
| Strategic relationships | 20% | 90% | \$0.5m | $20\% \times 90\% \times 0.5m = 90,000$ |
| Product Rollout or Sales | 24% | 50% | \$0.5m | $24\% \times 50\% \times 0.5m = 60,000$ |
| Final valuation | | | | \$410,000 |

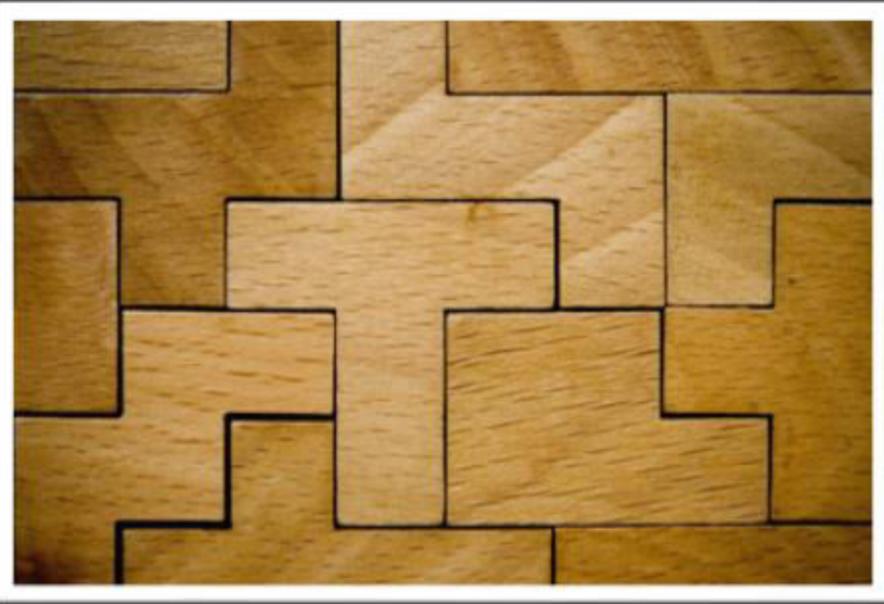
$$\text{Max Value} = \{ \$0.5m \} \times \{ (n) \text{ factors with } 100\% \text{ score} \}$$

||

\$2.5m

Business Value = \$410,000





Asset Based Approach

The total cost to recreate the business from scratch.

The Cost of Assets:

- ❖ Servers
- ❖ Buildings
- ❖ Machines
- ❖ Equipment
- ❖ Inventory

Focuses on a company's net asset value, or the fair-market value of its total assets minus its total liabilities. The asset-based approach asks what it would cost to recreate the business. The company's future potential isn't taken into consideration.



Financial Methods are appropriate for companies with a track record

These methods rely on **solid financial projections** based on the **historical performance** of the business.

—
Multiples
Method

—
Terminal
Value

Discounted Cash Flow Approach



The **Discounted Cash Flow (DCF)** Method focuses on projecting the startup's future cash flow movements. A rate of return on investment, called the "discount rate," is then estimated based on which it is determined how much the projected cash flow is worth. Since startups are just starting out and there is a high risk associated with investing in them, a high discount rate is generally applied.

Terminal value is the estimated value of a business beyond the explicit forecast period. It is a critical part of the financial model, as it typically makes up a large percentage of the total value of a business.

There are two major components: (1) the **forecast period** and (2) the **terminal value**. The forecast period is typically 3-5 years for a normal business (but can be much longer in such as in oil and gas or mining) because this is a reasonable amount of time to make detailed assumptions. Anything beyond that becomes a real guessing game, which is where the terminal value comes in.



Discounted Cash Flow Method with Multiples

1. Time Value of Money

$$\text{Present Value} = \text{Cash Flow} \div (1 + \text{discount rate})^n$$

*where n is the number of years

2. Terminal Value

$$= \text{EBITDA last year in projections} \times \text{EBITDA multiple}$$

3. EBITDA Multiple

$$= \text{the valuation of a comparable company} \div \text{it's EBITDA}$$

EXAMPLE

$$\text{Terminal value} = \$200,000 \times 0.75 \times 6 = \$900,000$$

*Assuming a multiple of 6

| | Year 1 | Year 2 | Year 3 |
|-------------------|-----------|-----------|-----------|
| Free Cash Flow | \$200,000 | \$200,000 | \$200,000 |
| Discount rate 10% | 0.90 | 0.83 | 0.75 |
| Net Present Value | \$180,000 | \$166,000 | \$150,000 |

*We assume that the discount rate is 10%



$$\text{Business Value} = \left[\begin{array}{l} \text{Sum of all years} \\ \$180,000 + \$166,000 \\ + \$150,000 \end{array} \right] + \left[\begin{array}{l} \text{Terminal value} \\ \$900,000 \end{array} \right] = \$1,396,000$$



Discounted Cash Flow Method with LTG

*Assumes cash flows will grow at constant rate



Terminal Value = $\frac{\text{Final Projected Year Cash Flow} \times (1 + \text{Growth Rate})}{\text{Discount Rate} - \text{Growth Rate}}$

$$= \frac{\$200,000 \times (1 + 5\%)}{10\% - 5\%} = 420,000$$

* Assuming the projected growth rate is 5%

| | Year 1 | Year 2 | Year 3 |
|-------------------|-----------|-----------|-----------|
| Free Cash Flow | \$200,000 | \$200,000 | \$200,000 |
| Discount rate 10% | 0.90 | 0.83 | 0.75 |
| Net Present Value | \$180,000 | \$166,000 | \$150,000 |

Business Value = $\left(\text{Sum of all years} \right) + \left(\text{Discounted Terminal value} \right)$

$$= \left(\$180,000 + \$166,000 + \$150,000 \right) + \left(\$420,000 \times 0.75 \right) = \$811,000$$



The First Chicago Method: Incorporating the Uncertainty

- ✘ Developed by the First Chicago Corporation Venture Capital
- ✘ Combines both Industry's Price **Multiples** method and **DCF**
- ✘ The appraiser determines three scenarios related to the exit strategy:
 - ✦ Optimistic – **successful IPO** at the end of the investment horizon;
 - ✦ Stable – steady stream of dividends, but **IPO never reached**;
 - ✦ Pessimistic – **failure**. Recovering the capital by liquidating the company's assets
- ✘ Once the scenarios are defined, the probability of each scenario should be determined
- ✘ Could be applied in the early and later stages of the startup's life cycle



First Chicago Method: **Steps**

Step 1: Define different scenarios for the company (best, mid, worst).

Start setting up a financial forecast (including revenues, earnings, cash flows, exit-horizon etc.) for each case.

A detailed qualitative analysis for the market trends and the company are necessary in order to estimate these scenarios.

Generally, the mid-case is the closest expectation of an analyst after the Due Diligence.

Step 2: Estimate divestment price for each scenario using multiples.

After setting up your financial forecast, you need to determine the terminal value at the time of the exit.

Estimating valuation by comparing the investment to other transactions within the same peer group. Peer groups in the venture industry are categorized by:

- ✦ Enterprise Industry
- ✦ Enterprise Stage
- ✦ Enterprise Region

There are various form of *Multiples* each suitable for different asset classes. Professionals in the venture industry will use *Multiples* based on KPIs like EBIT, Revenues etc.

Step 3: Determine Required Return and calculate each scenario.

Many VC's determine the required return internally, not trusting concepts like WACC or CAPM due to the incompleteness of the private equity market.

Estimating market risk for the industry, stage and region and determining a risk premium individually for each company are key factors.

The valuation for each scenario is the sum of the discounted terminal value and the discounted cash flows until the exit-horizon.



Step 4: Estimate probabilities of scenarios and calculate the **Enterprise Value** (weighted sum).

These probabilities are naturally correlated to your definition of the scenarios and the number of them.

Of course, it is impossible to estimate precise probabilities for every scenario. The idea is to take **extreme outcomes** into your valuation process.

At the end, calculate the weighted sum of the valuations depending on each scenario.

For both optimistic and pessimistic scenarios cash flows are calculated for the **investment horizon**:

- The terminal value is substituted with an **industry price multiple** as an exit in the **optimistic** scenario.
- A **constant growth** model is assumed in the **stable** scenario.
- The **liquidation value** is determined at **failure** scenario.

The **Enterprise Value** is probability weighted average of the enterprise value of each scenario:

$$Valuation^i = \frac{TV^i}{(1+r)^h} + \sum_{t=1}^h \frac{CF_t^i}{(1+r)^t}$$

$$Enterprise Value = \sum_{i=1}^3 p^i Valuation^i$$

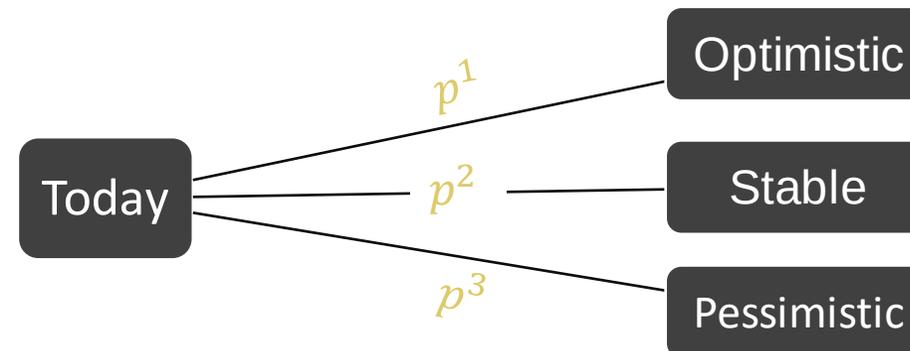
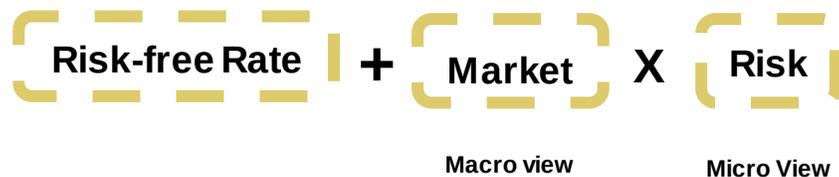
i = index of scenario

h = Time to exit

TV = Terminal Value

CF = Cash Flow

Investment Risk Calculation:



Start-up Valuation in Action: Basic Figures

| Values in BGN | 2013 A | 2014 A | 2015 E | 2016 F | 2017 F | 2018 F | 2019 F | 2020 F |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Number of Customers | 6 | 7 | 7 | 9 | 11 | 13 | 15 | 15 |
| Number of New Customers | 5 | 3 | 3 | 5 | 6 | 7 | 5 | 3 |
| Number of Churn Customers | -2 | -2 | -3 | -3 | -4 | -5 | -3 | -3 |
| Net New Customers | 3 | 1 | 0 | 2 | 2 | 2 | 2 | 0 |

| | | | | | | | | |
|---------------------|------|--------|-------|--------|--------|--------|--------|-------|
| Lost Customers in % | 0.0% | 33.3% | 42.9% | 42.9% | 44.4% | 45.5% | 23.1% | 20.0% |
| % ARR Churn | 0.0% | 28.6% | 42.9% | 33.3% | 36.4% | 38.5% | 20.0% | 20.0% |
| % ARR Expansion | 0.0% | 50.0% | 42.9% | 71.4% | 66.7% | 63.6% | 38.5% | 20.0% |
| % Net ARR Churn | 0.0% | -21.4% | 0.0% | -38.1% | -30.3% | -25.2% | -18.5% | 0.0% |

| | | | | | | | | |
|---------------------------------|---|----------|----------|-----------|-----------|-----------|------------|------------|
| Life Time Value, LTV | 0 | -678.04 | -452.03 | 32,844.09 | 52,055.27 | 65,407.39 | 145,367.92 | 145,367.92 |
| Cost to Acquire a Customer, CAC | 0 | 1,714.29 | 4,000.00 | 2,400.00 | 2,000.00 | 1,714.29 | 2,400.00 | 4,000.00 |
| LTV/CAC | 0 | -0.40 | -0.11 | 13.69 | 26.03 | 38.15 | 60.57 | 36.34 |

| | | | | | | | | |
|--|---|-------------|--------------|-------------|--------------|--------------|--------------|--------------|
| Churned Annual Recurring Revenue, ChARR | 0 | - 61,714.29 | - 112,408.16 | - 87,428.57 | - 131,710.58 | - 181,524.19 | - 118,155.75 | - 139,969.11 |
| Expansion Annual Recurring Revenue, ExpARR | 0 | 108,000.00 | 112,408.16 | 187,346.94 | 241,469.39 | 300,340.02 | 227,222.59 | 139,969.11 |
| Net New Annual Recurring Revenue (ARR) | 0 | 46,285.71 | - | 99,918.37 | 109,758.81 | 118,815.83 | 109,066.84 | - |

| | | | | | | | | |
|---------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| ARR Beginning Value | 0.00 | 216,000.00 | 262,285.71 | 262,285.71 | 362,204.08 | 471,962.89 | 590,778.73 | 699,845.57 |
| ARR Ending Value | 216,000.00 | 262,285.71 | 262,285.71 | 362,204.08 | 471,962.89 | 590,778.73 | 699,845.57 | 699,845.57 |

| | | | | | | | | |
|----------|------------|------------|------------|------------|------------|------------|------------|------------|
| Revenues | 216,000.00 | 262,285.71 | 262,285.71 | 362,204.08 | 471,962.89 | 590,778.73 | 699,845.57 | 699,845.57 |
| EBITDA | -49,321.80 | -1,356.09 | -1,356.09 | 98,532.28 | 208,221.09 | 327,036.93 | 436,103.77 | 436,103.77 |
| Earnings | -59,321.80 | -11,356.09 | -11,356.09 | 79,679.05 | 176,148.98 | 283,083.23 | 381,243.39 | 381,243.39 |
| FCFE | -49,321.80 | -5,984.66 | -1,356.09 | 29,687.22 | 177,673.10 | 283,701.65 | 382,836.71 | 353,743.39 |

| TTM Growth Rate of | | | | | | | | |
|--------------------|--|--------|-------|--------|---------|--------|--------|--------|
| Revenues | | 21.43% | 0.00% | 38.10% | 30.30% | 25.17% | 18.46% | 0.00% |
| EBITDA | | nm | nm | nm | 111.32% | 57.06% | 33.35% | 0.00% |
| Earnings | | nm | nm | nm | 121.07% | 60.71% | 34.68% | 0.00% |
| FCFE | | nm | nm | nm | 498.48% | 59.68% | 34.94% | -7.60% |

| Margin | | | | | | | | |
|----------|--|---------|--------|--------|--------|--------|--------|--------|
| EBITDA | | -22.83% | -0.52% | -0.52% | 27.20% | 44.12% | 55.36% | 62.31% |
| Earnings | | -27.46% | -4.33% | -4.33% | 22.00% | 37.32% | 47.92% | 54.48% |

Company Details:

- A Bulgarian start-up company applying the SaaS model for providing financial services
- History – 3 years
- Company in early stage of its life cycle



Start-up Valuation in Action: Scenarios, Assumptions, and Enterprise Value

| | Scenario 1. IPO * | Scenario 2. M&A Deal ** | Scenario 3. Stable Growth | Scenario 4. Failure |
|---------------------------|-------------------|-------------------------|---------------------------|---------------------|
| EV/Revenue | 3.1 | 2.4 | - | - |
| FCFE Growth Rate | - | - | 6% | - |
| First Stage Discount Rate | 40% | 40% | 40% | - |
| Discount Rate @ Exit | 20% | 20% | 20% | - |
| Exit Value in 2020 | 2,169,521.27 | 1,679,629.37 | 2,678,342.83 | - |
| Liquidation Value in 2020 | - | - | - | 325,000.00 |
| PV FCFE | 380,673.13 | 380,673.13 | 380,673.13 | - |
| Enterprise Value | 1,252,555.06 | 1,055,678.50 | 1,457,039.04 | 130,610.21 |
| Probability | 13.0% | 40.0% | 45.0% | 2.0% |
| Enterprise Value | 1,243,383.33 | | | |

Company Details:

- A Bulgarian start-up company applying the SaaS model for providing financial services
- History– 3 years
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This model incorporates four scenarios:

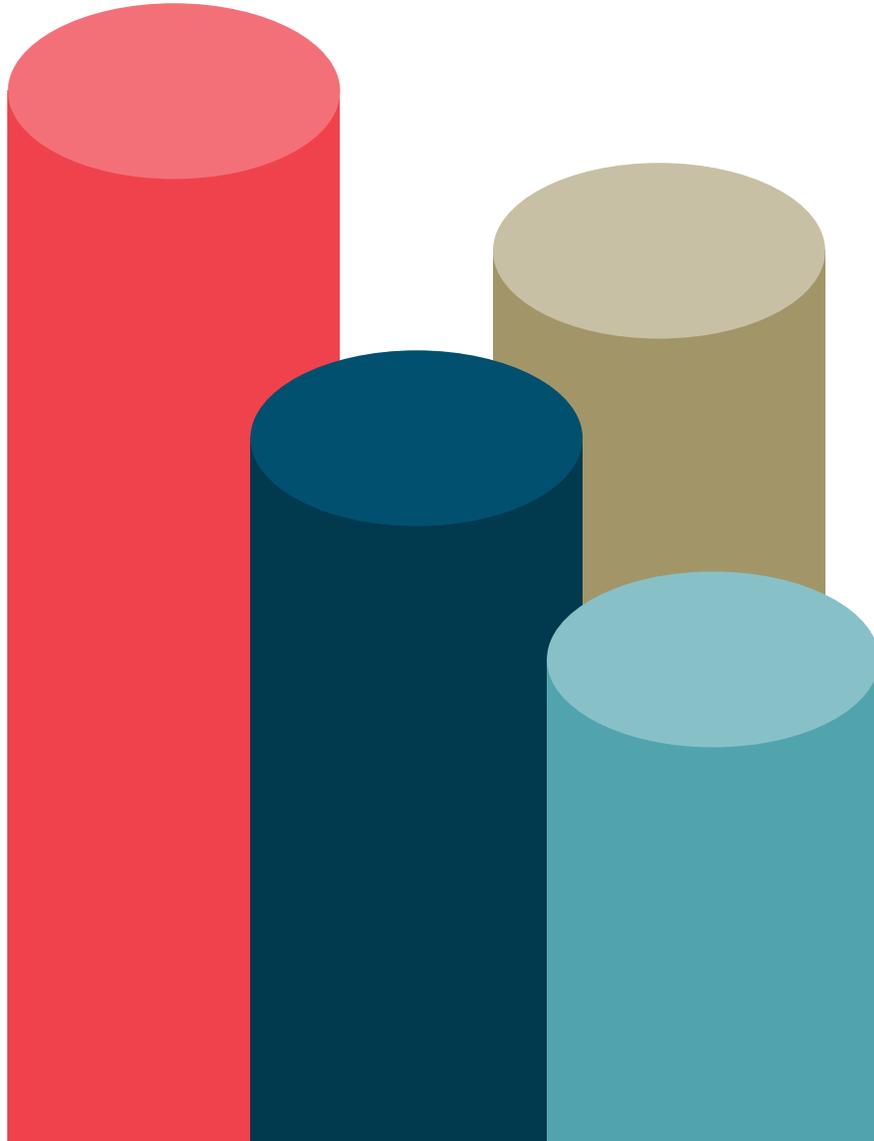
1. Successful IPO

2. M&A Deal

3. Stable Growth

4. Failure





The VC Method

For valuing early-stage & pre-revenue companies

VC's realize their returns when a liquidity event (an exit) occurs, and they expect a certain rate of return for their investments. This can be expressed as:

$$ROI = Exit Value \div Post\ money\ Valuation$$

which means:

$$Post\ money\ Valuation = Exit\ Value \div ROI$$

Exit Value (or **Terminal Value**), is the value the company is expected to be sold for. In the VC method this is usually calculated as a multiple of the company's revenues in the year of the sale. Since this method is used on early-stage companies often with negative cash flows, **EBIT** multiples are usually not applicable. Therefore, PE/VC databases are the best starting point for estimating an exit multiple.

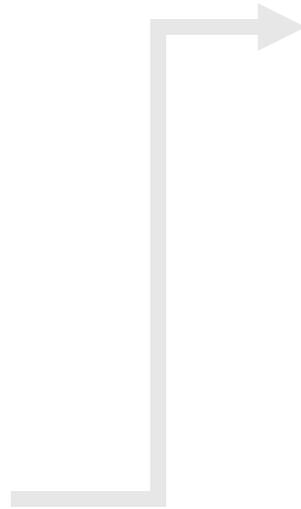
Rate of Investment or **Rate of Return**, is often expressed as a multiple of the initial investment. The ROI is a function of risk perceived by investors. Unlike traditional, public company investors, VCs are usually not fully diversified, most commonly holding 5-10 companies in their portfolio. For these reasons, the targeted **ROI** for early-stage companies are quite high, often reaching **10x**.

EXAMPLE

Illustrating on a practical example for a company that:

- Is expected to generate \$15 mil in revenues at the year of sale
- Assuming a sales multiple of 2x and expected ROI of 10x

| | |
|------------------------|----------|
| Revenue (year of sale) | \$15 mil |
| Multiple | 2x |
| Exit Value | \$30 mil |



| | |
|----------------------|----------|
| Exit Value | \$30 mil |
| Expected ROI | 10x |
| Post-money Valuation | \$3 mil |



| | |
|----------------------|---------|
| Investment | \$500k |
| Post-money Valuation | \$3 mil |
| Investor's Stake | 16.67% |



A \$500k investment would lower the **pre-money valuation** to \$2.5 mil.

04

This calculation does not consider future dilution. More likely than not, an investor in earlier rounds will experience dilution before an exit happens by the company issuing new stock in subsequent rounds. There are multiple ways to account for this effect. However, keeping true to VC method's we can just reduce the *pre-money valuation* by the expected dilution in future rounds.



Questions?



Mac AI
Ventures