



VALUATIONS of BUSINESS START-UPS

Converting the Story to Numbers

CHRIS DROUSSIOTIS

Speaker's Biography



Chris Droussiotis
Senior Managing Partner
Kinisis Venture Limited

Chris Droussiotis' training and expertise is in the area of Investment Banking. Possessing over 30 years of experience by working for numerous corporations in various executive management positions at Bank of America Merrill Lynch, CIBC Oppenheimer, Mizuho Financial Group, Bank of Tokyo-Mitsubishi Trust UFJ, Sumitomo Mitsui Banking Corporation.

Chris is a former Managing Director, General Manager and the Head of the Leverage Finance, Private Equity Sponsor Group & Structured Finance Department at Sumitomo Mitsui Banking Corporation (SMBC) managing a loan portfolio of over \$10 billion of large cap and middle market leveraged loans, as well as investments in SPV funds, CLOs and BDCs that are backed by leveraged loans and high yield bonds.

On April 2018, Chris left SMBC and join Kinisis Ventures Limited (KV), as a Senior Managing Partner. At KV, Chris is responsible with the financial analysis and valuation of start-ups. Recently he obtained a certificate from Columbia University on Blockchain technology which will help KV expand its consulting services to adapt many of the blockchain applications in various industries including fintech, biotech, EdTech and shipping.

Chris is also an adjunct Finance Professor for the last 20 years teaching at various college and universities including at Columbia University, Fordham University, Baruch College and Seton Hall University.

Chris has published three books ("The Analytical Approach to Finance, Investments and Credit", "Credit Risk Management and Analysis" and "Credit Analyst's Survival Manual")

10 STAGES OF A START-UP



#1 YOU GET THE GREAT IDEA



Source of Video:
Castle Placement

AGENDA

1. Personal Notes
2. Business Valuations 101
3. Valuation – Lucky or Good or Both?
4. Start-up Valuation Specific Methods – Connecting the story to Numbers
5. Probability Theory 101
6. Projections - Basic
7. Case Study (SaaS Fintech Start-Up Company)
8. Workshop – on Excel

PERSONAL NOTE

THIS IS WHAT I LEARNED OVER 34 YEARS VALUING COMPANIES

- *Valuing a company is highly subjective*
- *There is a lot of interpretation of the data used for the valuation methods*
- *Although there are several methods to value a company, the valuation is both art and science.*
- *There is some judgement that goes in choosing the data*
- *All the successful start-ups started with convincing storytelling. A good story is simple, credible and persuasive.*
- *Naturally, the buyer has a different perspective than the seller and therefore the valuation assessment could be derived differently*
- *Final Thought: We can spend hours and days analyzing the value of the company but at the end of the day **the value of anything is what someone is willing to pay.***

Anyone knows
this guy?



Anyone knows
this guy?

Laszlo Hanyecz
Crypto Developer /Code
writer / Early bitcoin
miner



May 22, 2010,
he bought 2
Pizza pies with
10,000 bitcoins

May 22, 2010: 1 Bitcoin=\$0.004
2 pizzas cost \$40

May 22, 2023: 1 Bitcoin = \$40,000
2 pizzas cost **\$400,000,000**

Today, 1 Bitcoin = \$60,000



BUSINESS VALUATIONS 101

• Established Companies (Public and Private)

- Method #1 – Using the stock price (public) – MARKET METHOD
- Method #2 – Intrinsic Value (using CAPM as the expected return) – MARKET METHOD
- Method #3 – Dividend Discount Model (DDM) (public) – MARKET METHOD
- Method #4 – Trading EBITDA Comparable (Public and Private) - MARKET METHOD
- Method #5 – Acquisition EBITDA Comparable (Public and Private) – MARKET METHOD
- Method #6 – Discount Cash Flow (DCF) (Public and Private) – INCOME METHOD
- Method #7 – Leveraged Buyout (LBO) (Public and Private) – INCOME METHOD

• Newly Established Companies/Intellectual Property (Private)

- Method #8 – Cost Replacement – Seed & Angel Investor – COST BASIS METHOD
- Method #9 – Option Pricing Method – Angel Investor – OPTION/PROBABILITY METHOD
- Methods #4-7 (Adjusted) for Market and Income methods based on VC and PE Equity – MARKET/INCOME METHODS

• Other Valuation Techniques for Intangibles (Trademarks, Brands, Goodwill) and Distress Companies

Categories

MARKET METHOD

INCOME METHOD

COST BASIS METHOD

OPTION / PROBABILITY METHOD

IP AND START-UPS VALUATION METHODS

METHOD	DESCRIPTION	PROS	CONS	WHEN USED
Market	Based on comparable market transactions of intangibles	Market driven – based on what someone is willing to pay (reflecting market prices based on demand and supply equilibrium)	Comparable transactions are sometimes not available	Most desirable but rarely used since a lot of the intangible products (IP) are new and unique
Income	Based on future cash flows (Royalties, Licensing or other Incremental profits)	Top-down approach, based on expected economic returns on initial cost	Input information can be very challenging since the info deals with future projections	Most used – building future benefits helps pricing the royalties, licensing fees based on return expectation
Cost/Replacement	Based on estimated cost of replacing or reproducing the intangible	Easier to calculate – calculate labor, materials and overhead (LMO)	The cost representing the book value does not always represent the market value	Not very common. Used as the basis before spending the money for the specific intangible.
Option Pricing	Based on option pricing models such as Black-Scholes measuring the current "out-of-money" to future "in-the-money" values	Using probability of success and sensitize to get a range.	Input variables to determine future value can be very challenging	Used when there is an obvious cash outflow before the cash inflow kicks in to value the specific intangible asset

BUSINESS VALUATIONS 101

- We will focus on 2 methods today in our workshop:
- Method #6 – Discount Cash Flow (DCF) (Public and Private) – **INCOME METHOD**
- Method #9 – Option Pricing Method – Angel Investor – **OPTION/PROBABILITY METHOD**

Venture Capital Investing

- Venture capital is a form of private equity that investors provide to startup companies (Phase I, II, III), as well as late-stage businesses that have long-term growth potential.
 - Phase I – Discovery & Proof of Concept (**Research Stage**)
 - Phase II – Testing & Third-Party verification (**Certifications / IP Pending / Pilot Program**)
 - Phase III – Pilot & Commercialization (New Customers/Revenue – **Start of Commercializing the product**)

Valuing Intellectual Property and Star-ups

Converting the Story to Numbers – First Step

- **First Questions an Investor will ask for valuing Start-ups**
 - What's the market size? **Determining the Revenue opportunity**
 - Can, how and when will the company penetrate this market? **Determining probability of success (achieving the revenue and acceleration (growth))**
 - How much will it cost to implement? **Cash Needs for Phase I, II and III**
 - How long before competitors crowd in? **Determining the length of the acceleration until maturity**

Valuing Intellectual Property and Star-ups

Converting the Story to Numbers – First Step

- **Factoring the Risks:**

- How much would it cost to develop this idea yourself – Look for funding support (Government agency and FF) – bootstrap approach
- How long might it take to get off the ground Determining the upfront cost and length (“death valley”) of Phase I and II
- Any unexpected challenges or problems that may arise Determining probability of success (on achieving the revenue and acceleration (growth)

Probability Theory 101

THREE FACTORS THAT NEEDED TO MEASURE BEFORE AN INVESTOR WILL INVEST:

- Measure Expected Return
- Quantify Risk
- Set Time (Exit)



Game: One toss of a coin to hit HEADS:

- Measure Expected Return (Win): **\$600** (payoff)
- Quantify Risk: **50/50 win/loss**
- Time: **in 2 seconds**

- What is the fair bet? - How much to Invest?
 - \$300 - mathematically using probability theory is $(50\% \times \$600) + (50\% \times \$0) = \$300 + 0 = \300

Game: One toss of dice to hit a SIX:

- Measure Expected Return (Win): **\$600** (payoff)
- Quantify Risk: **1/6 to win, 5/6 to lose**
- Time: **in 2 seconds**

- What is the fair bet? - How much to Invest?
 - \$100 - mathematically using probability theory is $(1/6 \times \$600) + (5/6 \times \$0) = \$100 + 0 = \100

Payoff = Enterprise Value – Development Cost

Using Black-Scholes Option Pricing Model to predict how out of money call option can be profitable

↑ Payoff = ↑ Enterprise Value – Development Cost
↓ ↓ ↓
C = S – X

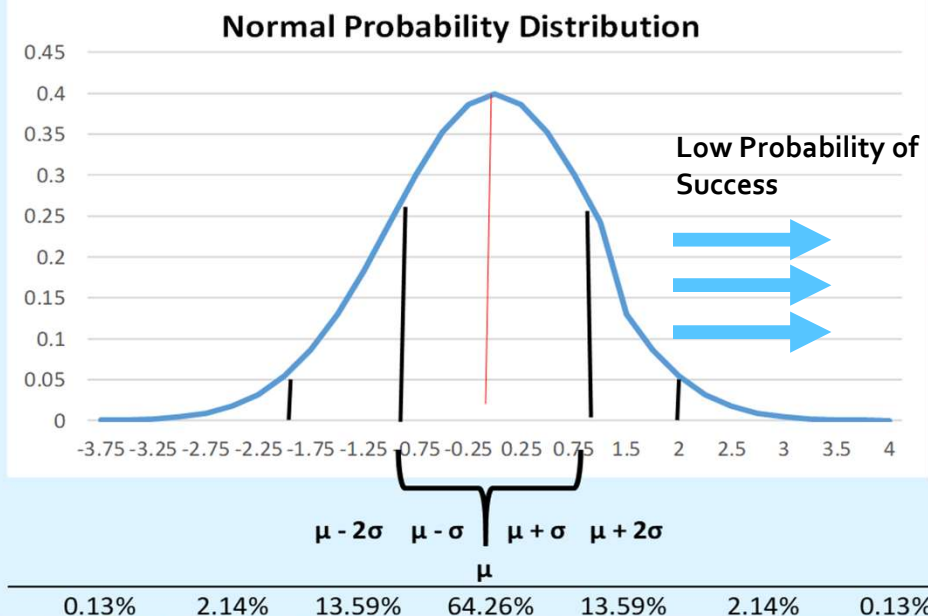
$$C = S e^{-\delta t} [N(d1)] - X e^{-it} N(d1)$$

Using Black-Scholes Option Pricing Model to predict how out of money call option can be profitable

$$C = Se^{-\delta t} [N(d1)] - Xe^{-it} N(d2)$$

$$d1 = \frac{\ln\left(\frac{S}{X}\right) + \left(i - \delta + \frac{\sigma^2}{2}\right) t}{\sigma\sqrt{t}}$$

$$d2 = d1 - \sigma\sqrt{t}$$



NORMAL DISTRIBUTION TABLE									
d	N(d)	d	N(d)	d	N(d)	d	N(d)	d	N(d)
3.200	0.999	1.900	0.971	0.600	0.726	-0.700	0.242	-2.000	0.023
3.100	0.999	1.800	0.964	0.500	0.691	-0.800	0.212	-2.100	0.018
3.000	0.999	1.700	0.955	0.400	0.655	-0.900	0.184	-2.200	0.014
2.900	0.998	1.600	0.945	0.300	0.618	-1.000	0.159	-2.300	0.011
2.800	0.997	1.500	0.933	0.200	0.579	-1.100	0.136	-2.400	0.008
2.700	0.997	1.400	0.919	0.100	0.540	-1.200	0.115	-2.500	0.006
2.600	0.995	1.300	0.903	0.000	0.500	-1.300	0.097	-2.600	0.005
2.500	0.994	1.200	0.885	-0.100	0.460	-1.400	0.081	-2.700	0.003
2.400	0.992	1.100	0.864	-0.200	0.421	-1.500	0.067	-2.800	0.003
2.300	0.989	1.000	0.841	-0.300	0.382	-1.600	0.055	-2.900	0.002
2.200	0.986	0.900	0.816	-0.400	0.345	-1.700	0.045	-3.000	0.001
2.100	0.982	0.800	0.788	-0.500	0.309	-1.800	0.036	-3.100	0.001
2.000	0.977	0.700	0.758	-0.600	0.274	-1.900	0.029	-3.200	0.001

Using Black-Scholes Option Pricing Methodology to Value Startups

- Is there a real option embedded in a decision or an asset (**Opportunity**)? **YES**
 - Applying the $C = S - X$
Call price (C) as the Investment Payoff (**Premium**), Strike Price (X) as the Cost of Development or the initial investment and Value of the start-up in the future as the underline Asset (S)
- Does that real option have significant economic value (**5x – 10x the original investment or is the “C” 5.0x-10x the “X”**)? **YES**
 - For example, questions like What is the competition? Is this idea exclusive? Can this idea solve problems? Is this a good time?
- Can that value be estimated using option pricing model (i.e. **Totally Addressable Market**)? **YES**
 - Leading to $S - X > \text{Minimum Return Expectation (5x – 10x)}$

First: Projections – Building the Financial Model

- All Companies that are in the process of raising capital, start with the base case financial model.
- The base case is the first approach to building the financial model.
- Since this model will be shared with all the stakeholders, including new and existing investors as well as management, the case needs to be simple, reasonable, and basic before any adjustments that need to be made to run other scenarios, such as the upside case, downside case and breakeven case.

Projections – Building the Financial Model

Building the Base Case

- The base case is the first projected scenario that the company sets up before making any of his or her own customized adjustments.
- When building this case, it is important for the company to arrange the revenue drivers or the cost assumptions so that are in line with industry or market standards and so the proper comparison can be made for follow-up adjustments.

Projections – Building the Financial Model

Revenue Drivers

- **The revenue drivers are customized based on the industry performance measurements that the company competes in.**
- This makes it easier to compare the results versus the industry operating benchmarks. For example, the assumptions used for a hotel company could be based on the average daily rate (ADR) representing what the customer will pay to rent the room for a night; the number of rooms available per property; and the occupancy rate (OR), which represents the rooms that are rented as a percentage of total available rooms.
- For companies that sell products, the revenues are typically driven by volume and price.
- For companies that is the service business, the revenues are typical service fees by the number of customers
- The company runs different assumptions on the volume growth and price increase/decrease assumption to drive the future revenue.
- The best starting approach of setting up these assumptions is to use historical growth rates based on market demand and extend them going forward. Then the company can use discretion to adjust these numbers based on expectation.

Case Study

Using both Income Method (DCF Analysis) and Option Pricing methods for valuating IP

- The Value of a firm's new innovative products that will be put to commercialization can be derived using the option pricing model
- Value of the Firm = Value of products after it is commercialized or licensed (DCF Analysis)
- Measuring the efficiency of the firm for converting its Development Cost into a commercial product and revenue.

Case Study

Using both Income Method (DCF Analysis) and Option Pricing methods for valuating IP

- **The Company:** A clean tech start-up company that developed an air monitoring device that can be used for both commercial and consumer use. The device assess Indoor Air Quality (IAQ) and promptly detect and report hazardous incidents that directly impact health and well-being. This smart device is empowered by AI and continuously monitors and measures factors such as temperature, humidity, CO₂, VOCs, PM_{1, 2.5, 4, 10}, and NO_x. airbeld™ is suitable for diverse industries and indoor environmental conditions for human presence and activity
- **The Opportunity:** The sales of devices and on-going SaaS opportunity are assumed based on market analysis (TAM) and penetration %s.
- **The Global Market:** The Global IAQ monitoring market size is projected to grow to \$10.15 billion by 2030. The Total Addressable Market (TSM) that this device can be used is currently at \$6.0 Billion. The device can be used in residential homes (376 million), Offices (130 million) and classrooms (9 million)

Case Study

Building the Sources and Uses through the Phase I – III and steady commercialization

Source of Capital (€)	Phase I	Phase II	Phase III
Government / University Grands	100,000	100,000	-
Equity Investment	-	100,000	650,000
Total Sources of Capital	100,000	200,000	650,000
Uses of Capital	Phase I	Phase II	Phase III
Materialas (Inventory)		10,000	65,000
Labor		-	110,860
Overhead			5,100
General Expenses	9,000	36,000	11,000
Administrative (Salaries)	45,000	90,000	566,500
Capex			
Cash Reserve	46,000	74,000	(43,460)
Total Use of Capital	100,000	200,000	650,000
Net Cash Burn	46,000	120,000	76,540

Case Study

Building the Top Line Revenue 6-year projection

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
OPERATING ASSUMPTIONS							
Product							
Price per Unit		\$340.00	\$340.00	\$340.00	\$340.00	\$340.00	\$340.00
% Increase/(Decrease)			0.0%	0.0%	0.0%	0.0%	0.0%
Quantity Sold		0	500	2000	5000	10000	20000
Segment Revenue	\$ -	\$ -	\$ 170,000	\$ 680,000	\$ 1,700,000	\$ 3,400,000	\$ 6,800,000
Service							
Services \$		\$100.00	\$100.00	\$100.00	\$100.00	\$100.00	\$100.00
% Increase/(Decrease)			0.0%	0.0%	0.0%	0.0%	0.0%
Quantity Sold		0	500	2000	5000	10000	20000
Segment Revenue	\$ -	\$ -	\$ 50,000	\$ 200,000	\$ 500,000	\$ 1,000,000	\$ 2,000,000
Total Sales	\$ -	\$ -	\$ 220,000	\$ 880,000	\$ 2,200,000	\$ 4,400,000	\$ 8,800,000

Case Study

Building the Top Line Cost Assumptions 6-year projection

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cost of Goods Sold						
Avg Prod Cost of Unit		\$120.00	\$120.00	\$120.00	\$120.00	\$120.00
Cost of unit as \$ of Price		35%	35%	35%	35%	35%
Avg Cost of Service		\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
Cost of unit as \$ of Price		10%	10%	10%	10%	10%
Materials	\$0	\$65,000	\$260,000	\$650,000	\$1,300,000	\$2,600,000
Avg Wages per hour		\$11.50	\$11.50	\$11.50	\$11.50	\$11.50
% Increase/(Decrease)		0.0%	0.0%	0.0%	0.0%	0.0%
Number of Labor workers		2	2	3	3	4
Hours per year		4,820	9,640	9,640	9,640	9,640
Labor Cost	\$0	\$110,860	\$221,720	\$332,580	\$332,580	\$443,440
Overhead as % of Manufacturing Sales		3.0%	3.0%	3.0%	3.0%	3.0%
Overhead	\$ -	\$5,100	\$20,400	\$51,000	\$102,000	\$204,000
Total COGS	\$ -	\$180,960	\$502,120	\$1,033,580	\$1,734,580	\$3,247,440

Case Study

Building the Top Line Cost Assumptions 6-year projection

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Operational Expenses						
Marketing/Selling						
Selling as % of Sales		10.0%	10.0%	10.0%	10.0%	10.0%
Selling	\$5,000	\$22,000	\$88,000	\$220,000	\$440,000	\$880,000
General (Rent, Supplies, Other)						
General as Percentage of Sales		2.0%	2.0%	2.0%	2.0%	2.0%
General	\$10,000	\$1,000	\$4,000	\$10,000	\$20,000	\$40,000
Administrative						
Number of Salaried Employees						
CEO	1	1	1	1	1	1
CTO	1	1	1	1	1	1
VP Marketing	1	1	2	2	2	2
Other Employees	1	2	5	7	10	10
Salaries						
CEO	\$ 50,000	\$ 90,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
CTO	\$ 40,000	\$ 80,000	\$ 90,000	\$ 90,000	\$ 90,000	\$ 90,000
VP Marketing	\$ 35,000	\$ 70,000	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000
Other Employees	\$ 30,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000
Salaries	\$ 155,000	\$ 360,000	\$ 640,000	\$ 760,000	\$ 940,000	\$ 940,000
Other Administrative Expenses % of Salaries	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Other Administrative Expenses	\$ 15,500	\$ 36,000	\$ 64,000	\$ 76,000	\$ 94,000	\$ 94,000
Administrative	\$ 170,500	\$ 396,000	\$ 704,000	\$ 836,000	\$ 1,034,000	\$ 1,034,000
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Opex	\$ 185,500	\$ 419,000	\$ 796,000	\$ 1,066,000	\$ 1,494,000	\$ 1,954,000

Case Study

Building the Cash Flow Assumptions 6-year projection

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cash Flow Assumptions						
Accounts Receivable Days	60	60	60	60	60	60
Inventory Days	60	60	60	60	60	60
Other Current Assets as % of Revenue	0%	0%	0%	0%	0%	0%
Accounts Payable Days	30	30	30	30	30	30
Accrued Expenses as % of Revenues	0%	0%	0%	0%	0%	0%
Other Current Liabilities as % of Revenues	0%	0%	0%	0%	0%	0%
Capex as % of Revenues	5%	5%	5%	5%	5%	5%
Other Assets as % of Revenue	0%	0%	0%	0%	0%	0%

Case Study

Deliverable Financial Information

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
INCOME STATEMENT						
Revenues						
Product	-	170,000	680,000	1,700,000	3,400,000	6,800,000
Services	-	50,000	200,000	500,000	1,000,000	2,000,000
Total Revenue	-	220,000	880,000	2,200,000	4,400,000	8,800,000
Revenue growth %						
Cost of Revenue	-	180,960	502,120	1,033,580	1,734,580	3,247,440
Gross Profit	-	39,040	377,880	1,166,420	2,665,420	5,552,560
Operating Expenses	185,500	419,000	796,000	1,066,000	1,494,000	1,954,000
EBITDA	(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560
Depreciation	-	-	-	-	-	-
Amortization	-	-	-	-	-	-
EBIT	(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560
Interest	-	-	-	-	-	-
EBT	(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560
Taxes	12%	-	-	-	-	-
Net Income	(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560

Case Study

Deliverable Financial Information

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
BALANCE SHEET							
Cash	120,000	584,500	142,502	545,492	275,244	807,404	3,118,332
Accounts Receivable	-	-	36,164	144,658	361,644	723,288	1,446,575
Inventory	-	-	29,747	82,540	169,904	285,136	533,826
Other Current Assets	-	-	-	-	-	-	-
Total Current Assets	120,000	584,500	208,413	772,690	806,792	1,815,828	5,098,733
Property, Plant & Equipment	-	-	11,000	55,000	165,000	385,000	825,000
Less Accum. Depreciation	-	-	-	-	-	-	-
Net Property, Plant & Equipment	-	-	11,000	55,000	165,000	385,000	825,000
Other Assets	-	-	-	-	-	-	-
Total Assets	120,000	584,500	219,413	827,690	971,792	2,200,828	5,923,733
Accounts Payable	-	-	14,873	41,270	84,952	142,568	266,913
Accrued Expenses	-	-	-	-	-	-	-
Other Current Expenses	-	-	-	-	-	-	-
Total Current Liabilities	-	-	14,873	41,270	84,952	142,568	266,913
Government Grands	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Long Term Debt	-	-	-	-	-	-	-
Other Long-term Liabilities	-	-	-	-	-	-	-
Total Liabilities	200,000	200,000	214,873	241,270	284,952	342,568	466,913
Common Stock	100,000	750,000	750,000	1,750,000	1,750,000	1,750,000	1,750,000
Retained Earnings	(180,000)	(365,500)	(745,460)	(1,163,580)	(1,063,160)	108,260	3,706,820
Total Net Worth	(80,000)	384,500	4,540	586,420	686,840	1,858,260	5,456,820
Total Liabilities & Net Worth	120,000	584,500	219,413	827,690	971,792	2,200,828	5,923,733

Case Study

Deliverable Financial Information

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
CASH FLOW STATEMENT							
Net Income		(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560
Add Depreciation		-	-	-	-	-	-
Add Amortization		-	-	-	-	-	-
Cash Income		(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560
Working Capital Activity							
Change in Accounts Receivable		-	(36,164)	(108,493)	(216,986)	(361,644)	(723,288)
Change in Inventory		-	(29,747)	(52,793)	(87,363)	(115,233)	(248,689)
Change in Other Current Assets		-	-	-	-	-	-
Change in Accounts Payable		-	14,873	26,397	43,682	57,616	124,345
Change in Accrued Expenses		-	-	-	-	-	-
Change in Other Current Liabilities		-	-	-	-	-	-
Total Working Capital		-	(51,038)	(134,890)	(260,668)	(419,260)	(847,632)
Investment Activity							
Capital Expenditures		-	(11,000)	(44,000)	(110,000)	(220,000)	(440,000)
Change in Other Assets		-	-	-	-	-	-
Total Investments		-	(11,000)	(44,000)	(110,000)	(220,000)	(440,000)
Financing Activity							
Government / University Grands		-	-	-	-	-	-
Long Term Debt		-	-	-	-	-	-
Other Liabilities		-	-	-	-	-	-
Equity Issuance		650,000	-	1,000,000	-	-	-
Total Financing Activity		650,000	-	1,000,000	-	-	-
Free Cash Flow		464,500	(441,998)	402,990	(270,248)	532,160	2,310,928
Beginning Cash		120,000	584,500	142,502	545,492	275,244	807,404
Free Cash Flow		464,500	(441,998)	402,990	(270,248)	532,160	2,310,928
Ending Cash		584,500	142,502	545,492	275,244	807,404	3,118,332

Case Study

Using both Income Method (DCF Analysis) and Option Pricing methods for valuating the Startup

	R&D Stage		Commercialization Stage					
	Phase I	Phase II	Phase III		Phase IV			
	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
REVENUES			-	220,000	880,000	2,200,000	4,400,000	8,800,000
EBITDA	(54,000)	(136,000)	(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560
Less Capex	-	-						
Less Working Capital								
Cash Flow from Operations and after Capex and WC	(54,000)	(136,000)	(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560
Less Cash Reserve								
Cash Needs		(190,000)	(185,500)	(379,960)	(418,120)	100,420	1,171,420	3,598,560

Case Study

Using both Income Method (DCF Analysis) and Option Pricing methods for valuating IP

SEED & ANGEL FINANCING LEVEL					
COST BASIS VALUATION			CALL OPTION PRICING VALUATION		
	Year -1	Year 0	Phase I/II	Phase III	INPUT
Transaction Uses - Cash Needs - from operations		(190,000)		(565,460)	IP Patent/Replac 10 years
Commulative			(190,000)	(755,460)	Cost of Delay = 0.0% 2.0/10
Transaction Sources - Capital Raising					Rfr= 3.00%
Government Grands - Firm			200,000		Variance = 11.00%
New Government Grands Expected			100,000	650,000	σ = 33.2% (High/Low deviat.)
Equit Investment		Private Equity			OUTPUT
Other Investors			300,000	850,000	d1 = 3.688301 (deviation of value)
Total Sources of Cash					d2 = 2.639492
Total Funding				1,150,000	N(d1) = 0.999887 (prob. of success)
Equit Investment					N(d2) = 0.995848
					Value= 3,746,210
					Equit Investment 750,000

VC Approach: Why do Business Start-up need Financial Analysis?

- **Step 1:** Determine the cash needs (building the sources and uses) for Phases I,II,III
- **Step 2:** Determine the valuation (Cost basis, options, market and income on many exit opportunity scenarios)
- **Step 3:** Used as a tool to sensitize (pivot, probability of success, cash needs)

REVIEW:

- Think from the VC and PE point of view: They look at the following 3 factors before they invest
 - Measure Expected Return
 - Quantify Risk
 - Set Time (Exit)
- Convert your story to value
- Basic Questions a Buyer will ask for valuing IP
 - What's the market size? **Determining the Revenue opportunity**
 - What are the competitive advantages? **Determining probability of success (achieving the revenue and acceleration (growth))**
 - How much will it cost to implement? **Cash Needs for Phase I, II and III**
 - How long before competitors crowd in? **Determining the length of the acceleration until maturity**
- Factoring the Risks:
 - How much would it cost to develop this idea yourself – **Look for funding support (Government agency and FF) – bootstrap approach**
 - How long might it take to get off the ground **Determining the upfront cost and length ("death valley") of Phase I and II**
 - Any unexpected challenges or problems that may arise **Determining probability of success (on achieving the revenue and acceleration (growth))**

FACTORS THAT START-UPS SUCCEED (WHAT MATTER THE MOST FOR START-UP according to Bill Gross)



IDEA



MANAGEMENT/TEAM



BUSINESS MODEL

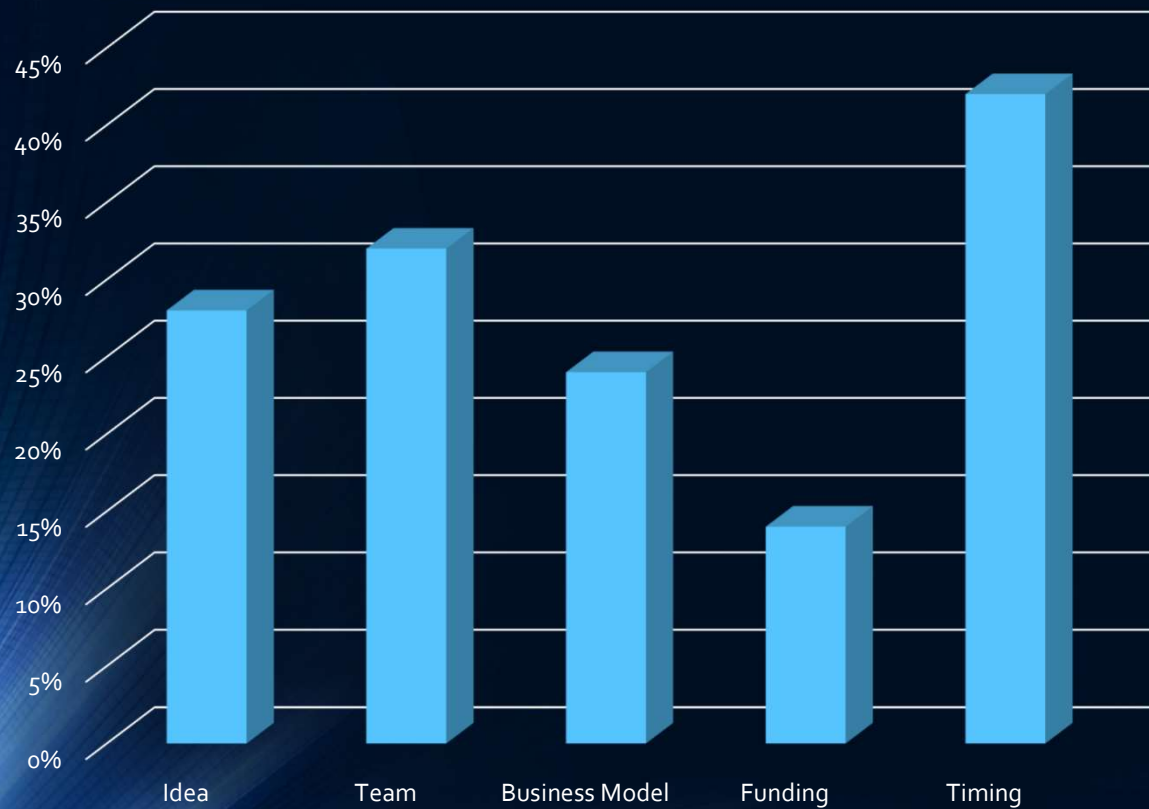


FUNDING



TIMING

Top 5 Factors in Success Across More than 200 Companies



FACTORS
THAT
START-UPS
SUCCEED