(1) Cash Flow Analysis (Financial Strategy)

(2) Midterm Comments

(3) Phase III Project Assignment
(1) Cash Flow Analysis

Before we can create a Financial Strategy for the start-up, we need to understand the flow of cash into and out of the business.

5-Step Process for Cash Flow Analysis

Step 1: Make a list of all the relevant cash flows of the start-up ($)

Cash Flow In:
- NOT Funding
- Revenue from selling the product
- Licensing revenue from patents
- Contract work for other companies (e.g., product development)

Cash Flow Out:
- People - managers, product developers, marketing/sales team, others.
- Equipment - computers, lab equipment, materials
- Facilities - building, office supplies, food, insurance.
Step 2: Determine the timing of the cash flows (typically done quarterly)

Facilities: rent & furnish an office space - $200K
People: hire product development team - $500K
Equipment: servers - $100K

Step 3: Determine the net cash flow for each period (quarter)
Step 4: Compute the present value of the net cash flow for each period (quarter).

Money loses value over time due to inflation, i.e., $1_{2015} > $1_{2016}.

We need to discount the future value of the cash flow in order to get its present value.

Let:

\[
\begin{align*}
FV & \triangleq \text{future value} \\
PV & \triangleq \text{present value} \\
d & \triangleq \text{discount rate (inflation rate)} \\
n & \triangleq \text{number of periods that the FV is in the future}
\end{align*}
\]

\[
PV = \frac{FV}{(1+d)^n}
\]

In the present, \( n = 0 \), so \( PV = FV \).
Example:

A venture capital firm has promised you they will invest $1 million but the investment will be 3 years in the future.

How much is that investment worth in today's dollars?

\[ FV = 1 \text{ m} \]
\[ N = 3 \]
\[ d = 10\% \text{ per year} \]

\[ PV = \frac{1 \text{ m}}{(1 + 0.1)^3} \approx 750 \text{ K} \]

What if the investment is to be made in 3 quarters?

Adjust \( d \) from years to quarters:

\[ d = \frac{10\%}{4} = 2.5\% \text{ per quarter} \]

\[ PV = \frac{1 \text{ m}}{(1 + 0.025)^3} \approx 930 \text{ K} \]
Example:

Based on your cash flow analysis, you promise the venture capitalist a $3M return on their $1M investment in 3 years.

How much is that return actually worth?

\[ FV = $3M \quad d = 10\% \quad n = 3 \text{ years} \]

\[ PV = \frac{0.3M}{(1+0.1)^3} \approx $2.25M \]

ROI = return on investment

\[ \frac{\text{return - investment}}{\text{investment}} \]

\[ \frac{$3M - $1M}{$1M} = 2 \text{ or } 200\% \text{ ROI} \]

without discounting

with discounting

\[ \frac{\text{ROI} = \frac{$2.25 - $1M}{$1M} = 1.25 \text{ or } 125\% \text{ ROI}} \]
Step 5: Compute the net present value of the start-up by summing up the present value of discounted cash flows.

Example: Present value assuming Q1Y1 is the start date and a 10% discount rate.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>FV(Net)</th>
<th>PV(Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 0</td>
<td>Q1Y1</td>
<td>- $1M</td>
</tr>
<tr>
<td>n = 1</td>
<td>Q2Y1</td>
<td>- $1.5M</td>
</tr>
<tr>
<td>n = 2</td>
<td>Q3Y1</td>
<td>- $1M</td>
</tr>
<tr>
<td>n = 3</td>
<td>Q4Y1</td>
<td>- $2M</td>
</tr>
<tr>
<td>n = 4</td>
<td>Q1Y2</td>
<td>+ $0.5M</td>
</tr>
<tr>
<td>n = 5</td>
<td>Q2Y2</td>
<td>+ $1M</td>
</tr>
</tbody>
</table>

NPV = -$3.9M

- With annual discount to quarterly.

General Rules:
- Perform cash flow analysis for 3-5 yrs
- If NPV > 0, start-up will get funding
- If NPV < 0, " " will NOT get funding

- Time frames for NPV to exceed $0.
  - Software company: 2-3 yrs
  - Hardware company: 3-5 yrs
  - Pharmaceutical, aerospace, energy: > 5 yrs