TIM 80 Lecture 13 (5/2/15)

Agenda

1) Feedback on Graded Midterm Exam

2) Project Phase III: Cash Flow Analysis

3) Financial Strategy: How Financing Works
   - Capital Structure
   - Business Cycle
   - Financial Metrics

4) Work on Project (Time Permitting)
1) Comments on the Midterm Exam

Overall the class performance on the midterm was very good.

Average Score: 86/100 (last year 77/100)

91-100: 34
81-90: 20
71-80: 9
70-2: 8

Corrections will be due next Thursday (5/21/15)

Final Score: (0.4 x original score) + 
(0.6 x corrections) 
= (0.4 x 86) + 
(0.6 x 100) 
= 95

You need to turn in the original exam and corrections.

Use Structured Problem Solving on the Corrections → Create a time-phased plan (Approach)
2) Project Phase III: Cash Flow Analysis

Need to estimate expenses (negative cash flows) and revenue (positive cash flows) for 3-5 years

Organize expenses by activity

1) Product Development
   - People (e.g., designers, engineers, etc.): how many people (5-10) and salary ($50,000-$100,000)
   - Equipment: software, desktops/laptops, servers, 3D printers, etc.
   - Facilities: 100-200 sq ft per person at $25/sq ft per month

2) Product Manufacturing
   - Number of units
   - Manufacturing cost per unit
   - Transportation cost
3) **Marketing and Sales**
   - people (sales people): how many
   - and Salary (will vary depending on product)
   - advertising campaigns: how many
     impression, cost per impression
     ($2 - $5 for 1,000)

4) **Management and Support**
   - people (e.g. CEO, CFO, CTO, etc.): how many people and Salary
   - legal
   - HR
   
   Estimate revenue based on business goals, market strategy, and product strategy.

1) Estimate the total (cumulative) target market size ($) for 3-5 years

   **Source: Market Strategy (Revenue Map)**

   \[ \text{total market size} = \sum_{i=0}^{N} \text{target market size} \times \left(1 + \text{growth rate}\right)^n \]
2) Forecast revenue for 3-5 years

Source: Business Goals (Market Share)

Revenue = total market size x desired market share

3) Determine the price per unit

Source: Product Strategy, Market Strategy (4.Pg)

4) Determine Sales Volume

\[ \text{Sales volume}(y) = \frac{\text{Revenue}(2)}{\text{price per unit}(3)} \]

When estimating sales volume, the product lifecycle must be taken into account.
Suggestions:

1) First, replicate the Polaroid cash flow analysis example in Excel, then change the numbers in the spreadsheet to match the cash flows for your start-up.

2) Work top-down and bottom-up

- Top-down: Market, Business Goals, Revenue, Price per unit, Sales volume
- Bottom-up

Perform 2-3 iterations.
③ Financial Strategy: Financing

The capital structure of a company refers to how the company is financed.

Companies are financed from 2 sources:

- The company's owner (Shareholder)
- Financial Institutions (Banks) or individuals that lend to the company (Debt Holders)

Cash contributed by shareholders is called Equity Capital.
Cash contributed by debt holders is Debt Capital.

The capital structure of a company is:

\[
\text{Debt Capital + Equity Capital}
\]

A high debt/equity ratio (leverage) increases earning potential but also bears more risk.

Also depends on industry:
Hardware companies > Software company
Business Cycle: Process of turning capital into profit

Example: 1 year business cycle for Startup
(All Numbers in $1,000)

Loan Interest
$25

Step 1: Raise Capital
Equity: 500
Debt: 500
Total: 1000

Return on Earnings (50)

Step 2: Create Assets
Product Development
Product Manufacturing
Facilities
Total: 1000

Step 3: Make Sales
Sale of the product
Licensing Technology (IP)

Total Revenue: 500

Step 4: Profit
Revenue - Costs
(Cost of goods, operational costs,)
Total Profit: 100

Dividends to Shareholders = 50
Financial Metrics for assessing a company

1) Capital Structure: \( \frac{\text{debt}}{\text{Equity}} \)

Example: \( \frac{\$500}{\$500} = 1 \)

2) Return on Assets (ROA): \( \frac{\text{Revenue}}{\text{Assets}} \)

\[ \frac{\$500}{\$1000} = 0.5 = 50\% \]

3) Profit Margin: \( \frac{\text{Profit}}{\text{Revenue}} \)

\[ \frac{\$100}{\$500} = 20\% \text{ (very good)} \]

4) Retention Rate: \( \frac{\text{Retained Earnings}}{\text{Profit}} \)

\[ \frac{\$50}{\$100} = 50\% \]
5) Return on Invested Capital (RoIC)

\[
\frac{\text{Profit}}{\text{Invested Capital}}
\]

\[
\frac{10,000}{10,000} = 10\% \\
\frac{1,000}{10,000} \text{ (Very good)}
\]

6) Return on Equity (ROE)

\[
\frac{\text{Profit}}{\text{Equity Capital}}
\]

\[
\frac{100}{500} = 20\% \\
\frac{500}{500} \text{ (Very good)}
\]

7) Return on Debt

\[
\frac{\text{Profit}}{\text{Debt Capital}}
\]

\[
\frac{100}{500} = 20\% \\
\frac{500}{500} \text{ (depend on interest rate)}
\]

8) Weighted Average Cost of Capital (WACC)

\[
WACC = \left( \frac{\text{Equity Capital}}{\text{Invested Capital}} \times \text{equity cost(\%)} \right) + \left( \frac{\text{Debt Capital}}{\text{Invested Capital}} \times \text{debt cost(\%)} \right)
\]

\[
= \left( \frac{500}{10,000} \times 10\% \right) + \left( \frac{500}{10,000} \times 5\% \right) = 7.5\%
\]