TIM 80C 5/5/16 Lecture 12

(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. ($)

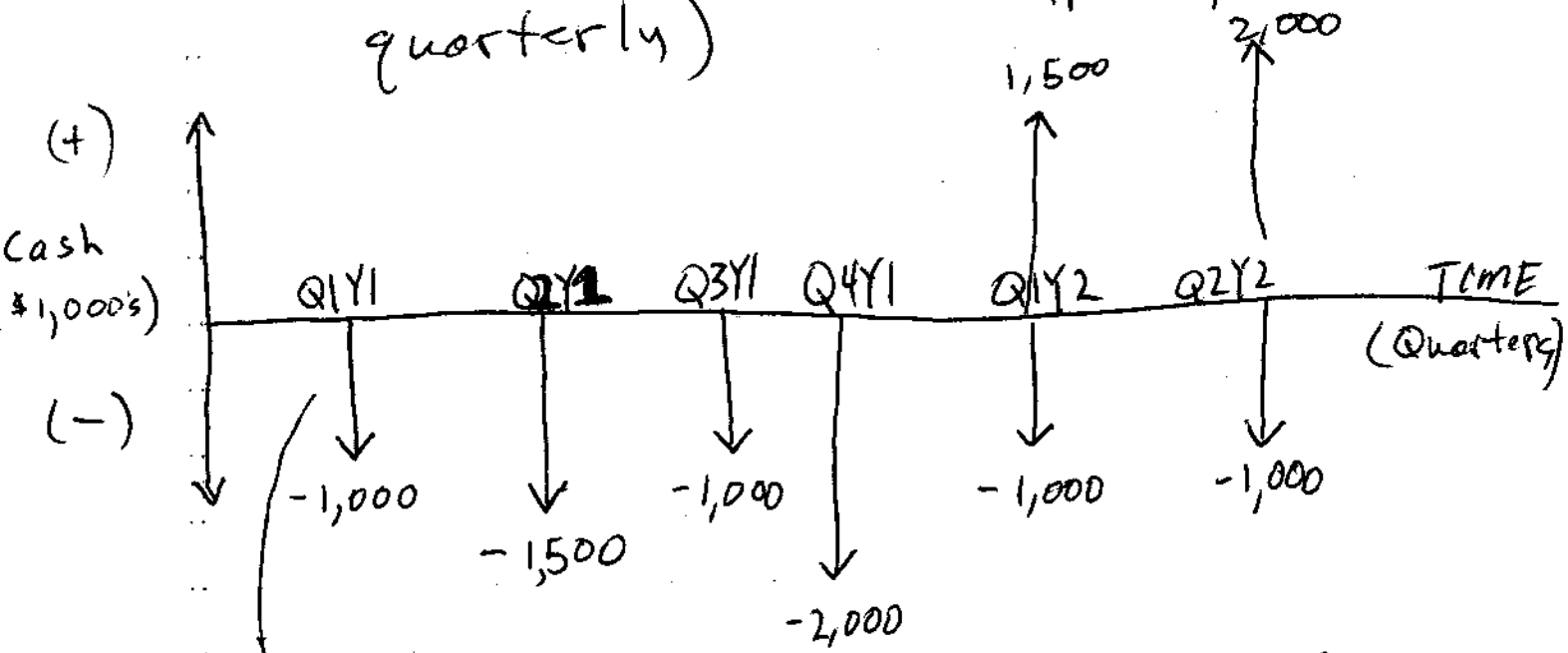
Cash flow in:

- NOT FUNDING
- revenue from selling the product
- licensing revenue from patents
- contract work for other companies (e.g., product development)

cash flowing 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)

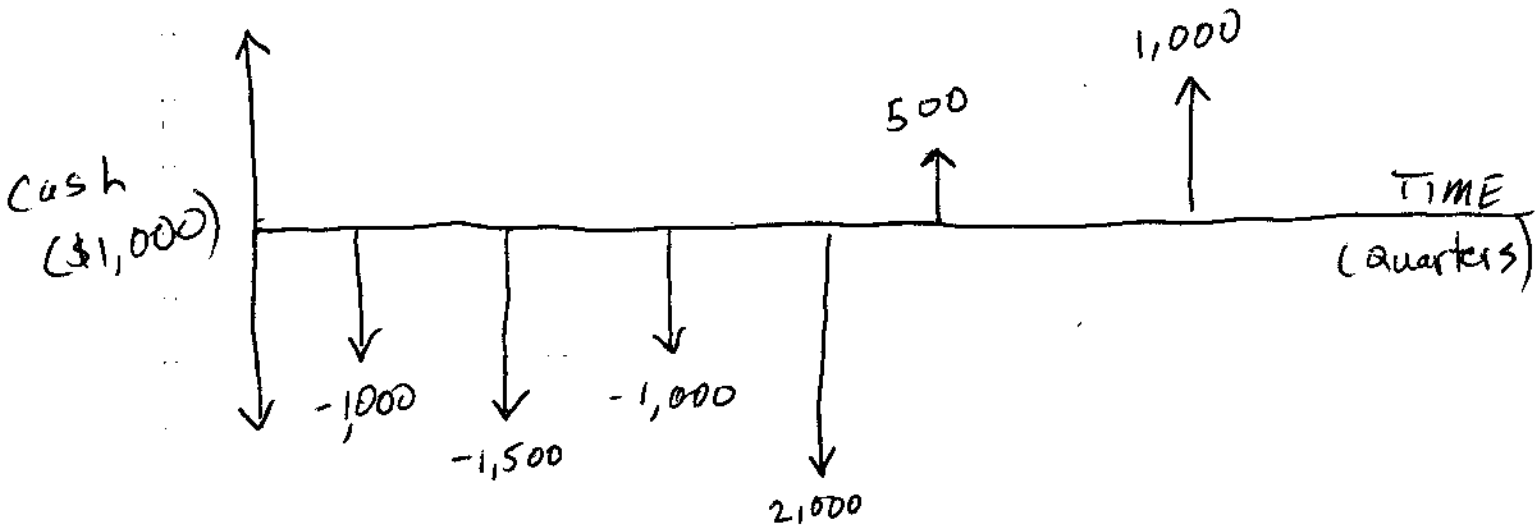


Facilities: rent & furnish an office space - $200K

People: hire product development team - $500K

Equipment: servers - $100K

STEP 3: Determine the ~~gross~~ 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:

$FV \triangleq$ future value
$PV \triangleq$ present value
$d \triangleq$ discount rate (inflation rate)
$n \triangleq$ number of periods that the FV is in the future

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

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?

$FV = \$1\,M$
$n = 3$
assume $d = 10\%$ per year

$$PV = \frac{\$1\,M}{(1+0.1)^3} \approx \$750\,K$$

what if the investment is to be made in 3 quarters

adjust d from years to quarters

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

$$PV = \frac{\$1\,M}{(1+0.025)^3} \cong 930K$$

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?

$FV = \$3M \qquad d = 10\% \qquad n = 3 \text{ years}$

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

ROI $\triangleq$ return on investment

$$\triangleq \frac{\text{return} - \text{investment}}{\text{investment}}$$

without discounting

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

with discounting

$$\text{ROI} = \frac{\$2.25 - \$1M}{\$1M} = 1.25 \text{ or } 125\% \text{ ROI}$$

* 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

	Quarter	FV(Net)	PV(net)
n = 0	Q1Y1	- $1M	- $1M
n = 1	Q2Y1	- $1.5M	- $1.46M
n = 2	Q3Y1	- $1M	- $0.95M
n = 3	Q4Y1	- $2M	- $1.85M
n = 4	Q1Y2	+ $0.5M	+ $0.45M
n = 5	Q2Y2	+ $1M	+ $0.85M
			NPV = - $3.9M

- swith 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