

## Homework Assignment 6

*Due: Thursday, November 12th*

**Directions:** Collaborate with the same group members you had before. Problems take long to read but can be answered very concisely (all in a few lines). They are meant to make you think. Write up your solutions as a PDF file and follow the instructions from last time to upload your homework.

1. **Capital Models:** Suppose you work in company *Z*. In the first round of financing (Series A) 1,000,000 shares are issued. Assume that the pre-money valuation of *Z* was 2 million dollars and the VCs value the company at 3 million dollars.

- What is the post money valuation of the company?
- Suppose you are part of the initial employees and you are granted 25,000 shares at 10 cents a share out of 1,000,000 shares issued in Series A. What percentage of the company do you own? If the company is sold in a year for 40 million, how much capital gains do you realize?
- Now consider a slightly different scenario. Assume that you are a founder and own 8% of the company after the first round. Suppose there is a Series B round and the pre-money valuation of the company (before Series B) is 10 million. The second round financiers put in 5 million dollars. What is the post-money valuation and how much has your percentage dropped to (called dilution)?
- If the company (in the second scenario) is now sold for 60 million a year later, how much capital gains will you realize if you were allocated your shares at 0.001 cents (almost zero, so-called founder shares). Would you have done better if your company had been sold for 40 million without a Series A or if your company had been sold for 60 million after a Series B?

2. **Business Models:** Make up a simple back-of-the envelope business model for any of the lectures (except Taaz and NetSift) you heard about. For example, you could do one on Griswold's cell phone pollution sensor, Bafna's fast cancer detection, Ettinger's Automatic Cameraman, or Agrawal's Green Computing (either Cell to Notify or Somniloquoy), or even Kastner's underwater communication (though you would have to be very creative to make money there). You are doing this not so much because you may start a company but so you can evaluate the business potential of ideas. Of course, ideas can be beautiful and compelling even if they have no immediate business value as in Kastner's work.

Only try and capture two things: the Total Available Market or TAM (catalyze fantasy) and possible exits (i.e. which company will buy you if you cannot make a stand-alone business). Here is a simple framework to do so. Recall that TAM assumes a perfect world where there is no competition, your advertising is perfect, and every possible customer buys you. It's kind of what we call in computer science an upper bound.

- Write a 1 line elevator pitch for your company.

- Next, identify your customers (i.e, end consumers, Fortune 500 companies, other companies or market segments such as cosmetic users). Use the Internet if needed to make an educated guess as to how large the number of customers can be.
- Identify your product (is it a box, is it software, is it a service)
- Identify your revenue model (do you sell equipment one-time as in say a computer or do you have a subscription model as in Antivirus),
- Make up a number as to the maximum you can charge your customers over a 5 year period. Justify this number in a line (for example, if you are adding a feature to edit digital photographs that costs 50c its hard to charge more than say 5c per photo).
- Multiply number of possible customers by maximum you can charge each in a 5 year period by number of possible customers to get the TAM.
- Now think what big company (e.g., Sun, Cisco, Microsoft, Qualcomm, Google) might buy your company and briefly justify why it is in the big companies interest to do so.