Chapter 4. Venture Deals

Questions and Problems

1. Discuss how you would expect the contracting process and contract provisions between an entrepreneur and a prospective investor to be different in each of the following situations:
   a. There are only a few specific possible outcomes that might result from the venture. The parties know what the possibilities are and agree about the probability of each outcome.
   b. Same as (a), except that the parties disagree about the probabilities of the various outcomes.
   c. The future for the venture is highly uncertain, but the parties agree about the risk and expected return of the project, and know that they agree.
   d. Same as (c), except that the parties do not know that they agree about risk and expected return.
   e. The future for the venture is highly uncertain, and the parties disagree about the risk and expected return, but do not know whether they agree or not.
2. Describe two ways of mitigating the adverse selection problems that can arise between VCs and entrepreneurs and between angel investors and entrepreneurs.
3. Explain what is meant by "bounded rationality." How would you expect bounded rationality to affect the contracting process between an entrepreneur and an investor? How would you expect the contract terms between the two to be different from a situation where "rationality" was not "bounded"?
4. Explain what is meant by "opportunism." What is the difference between *ex ante* behavior and *ex post* opportunism? How would you expect either one to affect the contracting process and contract terms between an entrepreneur and an investor?
5. How can investments in reputation, explicit contract provisions, and investments in project-specific assets be used to create "hostages" or "bonds" that facilitate the contracting process? How would you expect the provisions of contracts between entrepreneurs and investors to be different in the presence of non-salvageable sunk investments by the entrepreneur, the investor, or both?
6. Alan is a printer and Steve is a publisher. Steve proposes to buy publishing services from Alan for a price of $8,000 per day. To accept the offer, Alan must install a printing press near Steve's location. If he does, the fixed costs, amortized over the life of the press, will be $4,500 per day (including the return on the capital investment). If the contract were terminated, Alan would own the press and be able to move it to a new location to realize some salvage value. The salvage value, if moved, is $2,000 per day. Daily operating cost of the press is $2,500 and will be incurred by Alan for operating the press.
   a. What is the breakeven price at which it would make sense for Alan to enter into a contract with Steve?
   b. Of that total price, how much would be a quasi-rent on the fixed investment and how much would be payment for the variable cost of production?
   c. How much of the quasi-rent would be appropriable by Steve once the press was in place? Why?
   d. Suppose a third party, Ed, is willing to buy printing services from Alan at the same location as Steve, and will pay $6,500 per day for the service. How much of the quasi-rent is appropriable?

e. Using this example, discuss the relationship between opportunism and the small numbers bargaining problem.

7. An entrepreneur is currently the sole shareholder in her venture, with 100,000 shares. An investor offers her $60,000 for 20,000 new shares. What are the pre- and post-money values of the venture?

8. After its last round of financing, a venture had 400,000 shares outstanding and a post-money value of $2 million. If the entrepreneur is confident the company is currently worth 25% more that the post-money valuation in the last round and needs to raise $500,000, how many shares will he sell? What would be the pre- and post-money values of the venture for the current round?

9. A venture with 2 million total common shares – 1.4 million owned by the entrepreneur and 0.6 million by an angel investor – had a post-money value of $8 million after its last (and only) round of outside financing. The company has run into some development delays and needs to raise additional capital. A new investor offers $500,000 in exchange for 200,000 new common shares.

   a. If there is no ratchet agreement, what will be the post-money value after the $500,000 investment? How much is the entrepreneur's stake worth?

   b. Now assume the angel investor's agreement includes a ratchet provision. Under the terms of the ratchet, the angel investor in the previous round will receive enough new shares for free so that his average cost per share is the same as that of any new investor. Given your answer to part (a), and including the impact of the ratchet, what price per share would the new investor seek, and how many new shares would the existing angel investor receive? Now how much is the entrepreneur's stake worth? Note: You can do this using Solver/Goal Seek, by trial and error, or by finding the solution algebraically.

10. In a previous round of financing for a resort spa, an investor contributed $2 million in exchange for 1 million shares of common stock. The entrepreneur retained ownership of 2 million shares. Because of massive construction cost overruns and delays, things have not gone well for the spa since the investment. The venture now needs another $1 million, with which the entrepreneur hopes to complete development. However, the existing investment agreement includes a ratchet provision for the prior investor. Under the terms of the ratchet, that investor will receive enough new shares for free so that the investor's average cost per share is the same as that of any new investor.

    a. Suppose that in the absence of the ratchet provision a new investor would be willing to accept 1.25 million shares in exchange for the $1 million investment. Compute the post-money valuation of the venture.

    b. Now, based on the valuation in part (a), giving effect to the ratchet provision, what price per share would the new investor seek, and how many new shares would the existing investor receive? Note: You can do this and part (c) using Solver/Goal Seek, by trial and error, or by finding the solution algebraically.

    c. Suppose the ratchet agreement has a floor that limits the average cost of the existing investor to a minimum of $1 per share. How would that limitation affect the price per share for the new investor and the number of new shares going to the existing investor?

    d. What fraction of the equity would the entrepreneur end up retaining under each of the three scenarios?

11. An existing biotechnology venture is seeking an infusion of $5 million to carry it to the next milestone. The company has a prototype of a device for using ultrasound to shatter kidney stones. The $5 million is needed to complete the testing required for FDA approval. An investor proposes to provide the

capital in exchange for 2 million shares of common stock. Alternatively, the investor will accept 1.8 million shares of preferred stock, convertible to common on a 1 for 1 basis, or the investor will accept 1.5 million convertible preferred shares, along with warrants to acquire an additional 1.5 million shares for a nominal price. The warrants can only be exercised if the venture fails to achieve the revenue level projected by the entrepreneur to be achieved two years after the investment. In any case, the entrepreneur would own 2.5 million shares of common stock. Compute the pre- and post-money valuations for each scenario. If you were the entrepreneur, what factors would you want to consider in deciding which of these offers to accept? If you were the investor, how would you interpret the entrepreneur's choice?

12. After its last round of financing, a venture had 1,000,000 shares outstanding and a post-money value of $2 million. Eddy, the entrepreneur, however, needs to raise more money. His only hope, Angel Investor, agrees to invest an additional $1,000,000 for a 40% share of the company. Is this offer to invest an "up round" since the post-money value on the new deal is $2.5 million, whereas the previous post-money value was $2 million? Explain why or why not.

13. A term sheet provision calls for a Series A investor to receive convertible preferred shares, specifying a 2X liquidation preference. The investor puts in $4 Million for 20% of the company. If the firm is liquidated for $20 Million, what amount does the Series A investor receive?

14. Maxwell Hacker, a software developer and entrepreneur, has developed very promising gaming software and is considering a financial deal with a first-round investor. The investor and Hacker have agreed on a $2 million investment for 2 million shares of the company, including a full ratchet. The resulting post money valuation is $20 million.

    a. Explain the purpose of including a full ratchet provision in this financing deal.

    b. At this point, how many shares does the entrepreneur have and how many shares does the investor have?

    c. Now suppose that after the round-one investment Hacker has been stymied by architecture issues and will need considerably more money to continue its line of software. As a result, the post-money valuation from the first round drops to $8 million, so that this $8 million would become the pre-money value in the next round of investing. Hacker estimates that he needs $4 million of new investment to continue. If Hacker is able to raise the $4 million, what will happen to the price per share with the full ratchet in place? What fraction of the company will Hacker own after the round?

15. A term sheet provision calls for a Series A investor to receive participating convertible preferred shares specifying a 2X liquidation preference. The investor puts in $4 Million for 20% of the company. If the firm is liquidated for $20 Million, what amount does the Series A investor receive?

16. Assume there has been only one round of financing for Itsy.com (a Series A investment of $5 million in convertible participating preferred at a $10 million pre-money valuation). If converted, the Series A investors would own 33% (rounded) of the company ($5M/($10M + $5M)) and the entrepreneur would own 67% (rounded). Now assume that the company has an offer to be acquired for $30M. The Series A investor preferred shares have a liquidation preference and participate with a 3X cap. How much will the investor receive in total proceeds?

17. A venture has a $10,000 convertible note from a prior round and the entrepreneur has 10,000 shares. A new investor will invest $20,000 for a 40% equity interest in the venture. With no cap or discount, the entrepreneur's ownership interest would be valued at $20,000, the new investor would get 10,000

shares, and the early round investor's note would convert to 5,000 shares. However, the note has a cap of $18,000 (based on the entrepreneur's ownership--the negotiated pre-money from that round) and the note also has a 20% discount. It will convert based on either the cap or the discount, depending on which is better for the early investor. Will it be more advantageous to convert at the 20% discount? Explain. (Note--it is not necessary to do the detailed calculations to answer this question).

18. A founder holds 10,000 shares in an early-stage company. The seed investor has invested $15,000 as a convertible note with a negotiated cap in that round of $10,000 (and no discount). The note converts at the next equity financing round. A new investor emerges who wants to invest $18,000 for a 40% equity interest in the venture, which will result in a post-money value of $45,000 in the current round. (a) At what value per share would the note convert? (b) How many shares will the note investor get? (c) Based on pre-money value and shares, what is the value per share for the new investor? (d) How many shares would the new investor get for the $18,000 investment?

19. There has been only one round of financing for Snype.com (a Series A investment of $10 million in convertible participating preferred at a $15 million pre-money valuation). If converted, the Series A investors would own 40% of the company ($10M/($10M + $15M)) and the entrepreneur would own 60%. The company has an offer to be acquired for $70M. The Series A preferred shares have a liquidation preference of 1X and participate with a 3X cap. (1) Under the capped liquidation preference how much money would the Series A investor receive? (2) By converting to common stock, how much would the investor receive? (3) So is it better to convert or take the liquidation preference?

20. A founder holds 10,000 shares in an early stage company. A seed investor has invested $20,000 as a convertible note with a negotiated cap in that round of $16,000 and a discount of 20%. The note converts at the next equity financing round. A new investor emerges who wants to invest $30,000 for a 40% equity interest in the venture, which will result in a post-money value of $75,000.

    Cap: (a) At what value per share would the note convert? (b) How many shares would the note investor get? (c) Based on pre-money value and shares, what would be the value per share for the new investor? (d) How many shares would the new investor get for the $30,000 investment?

    Discount: (a) What are the pre- and post-money values? (b) Find the price per share by solving the simultaneous system with the new investor getting 40% and the entrepreneur and prior investor getting a total of 60% of the shares. (c) Find the total number of shares and each party's share holdings.

21. A founder holds 10,000 shares in an early stage company. A seed investor has invested $15,000 as a convertible note with a negotiated cap in that round of $10,000 (and no discount). The note converts at the next equity financing round. A new investor emerges who wants to invest $18,000 for a 40% equity interest in the venture, which will result in a post-money value of $45,000. (a) At what value per share would the note convert? (b) How many shares would the note investor get? (c) Based on pre-money value and shares, what would be the value per share for the new investor? (d) How many shares would the new investor get for the $18,000 investment?

22. An entrepreneur and a venture capitalist are engaged in a negotiation. The entrepreneur argues that the pre-money value of the venture is $8M. The VC argues that the entrepreneur's valuation is too high and that the pre-money value is $5M. They both have read "The Art of the Deal" and each thinks the other is bluffing in order to get more favorable deal terms. How might you use contingent

contracting terms to help determine whether each party truly believes the valuations they claim? (A specific example would be most helpful for answering this question.)

23. An entrepreneur has 1000 shares of the venture. An early investor invested $12,000 for 4000 shares that included a full ratchet provision. Now, in a subsequent round, an investor is willing to invest $6,000 for 30% of the ending equity. If there had been no ratchet provision, (a) how many shares would the new investor need to achieve a 30% interest, and (b) what would be the implied value per share? With the ratchet, (c) what would be the price per share, (d) how many shares would be outstanding, and (e) what would be the total implied value of each party's shares?