SpiffyTerm, Inc.: January 2000

January 1, 2000 was not a party day for the three founders of SpiffyTerm, Inc. Annabella Labella, Krishnupara Ramakrishna, and Bob Sledge were MBA students at a prestigious West Coast business school that was known for its beautiful red-roof-tiled buildings and for its hardworking MBAs. Instead of joining the futile celebrations for a turn of the millennium that was really just a counting mistake, they decided to focus on the ongoing negotiation that they had had with a number of venture capitalists. The three students had founded the new company on the basis of an idea that had come to them while munching burritos in the school’s famous cafeteria. They were convinced that the recent Internet boom had missed the real opportunities offered by this new technology. They wanted to explore the Internet’s true potential by doing something that I would like to tell you about, but I would have to shoot you if I did. All I can say is that their idea involved living creatures on Mars, a really cool Web site, and lots of chocolate chip cookies for the company party.

What preoccupied the founders most was a term sheet they had recently received from their contact partner—a curious individual by the name of Wolf C. Flow—at a well-known Sand Hill venture capital firm called Vulture Ventures (Exhibit 1). As far as the founders of SpiffyTerm, Inc. were concerned, this term sheet was so incomprehensible that it could have been written in Swahili. So instead of celebrating the new millennium, the founders decided to use this day to understand the term sheet, and, most important, to determine what valuation and other terms they should be bargaining for.

SECTION 1: BASIC VALUATIONS

The founders of SpiffyTerm, Inc. wanted to begin by calculating what they thought would be an appropriate valuation. Annabella suggested they read “A Note on Valuation of Venture Capital Deals” (Stanford GSB Case Study E-95) that one of her young and brilliant professors had written up in a moment of utter lucidity. This method required that the owners take account of the current as well as anticipated future financing rounds. The founders thought they needed to raise $4 million at this time. Currently, they had allocated 5 million shares to themselves, and they wanted to put aside an option pool of 1.5 million shares for future hires. The founders also believed that they would need to raise an additional $2 million after two years.
Wolf C. Flow had offered to invest $4 million at a price of $1 per share, but the founders were not convinced that this was a fair valuation. Instead, they wanted to model what an appropriate valuation might look like. They were quite confident that SpifyTerm, Inc. would be able to do an IPO after four years, at a valuation of about $80 million. But they realized that there were risks in their venture, so they thought that everybody would apply a discount rate of 45 percent.

**Question 1a:** What valuation do these assumptions suggest?

**Question 1b:** The founders also wanted to do some sensitive analysis with their assumptions. They wanted to know how the valuations would change if the second round of financing required $3 million? And what would the valuation be if they raised $6 million up front with no further round thereafter?

Obviously, these valuations differed from the one proposed by Wolf C. Flow. The founders thought that Wolf C. Flow had worked off the same base assumptions, but that he used maybe a different discount rate, or maybe a different IPO value.

**Question 1c:** If Vulture Ventures used the above valuation model, and indeed used a 45 percent discount rate, what implicit valuation after 4 years must they have used?

(Hint: for this and many subsequent questions it is helpful to use the “goal seek” command in Excel.)

**Question 1d:** If Vulture Ventures used the above valuation model, and believed the IPO value of $80 million, what implicit discount rate must they have used?

**Question 1e:** A friend of Bob, called Waz, was convinced that the investors were using the assumption of 1d, but he reasoned as follows: If Vulture Venture wants to pay only $1 per share, maybe the founders could simply increase their initial number of shares from 5 million to 10 million, and the option pool from 1.5 million to 3 million? This way everybody would win: the founders get more shares, and the investors get the price per share that they want. Based on this reasoning, should Waz get an honorary MBA degree?

**Question 1f:** The analysis so far implicitly assumes that the investors are holding straight equity. Under the term sheet proposed by Vulture Ventures, is this a valid assumption? (You don’t need to make any calculations for this part!)

**SECTION 2: VALUATION WITH ALTERNATIVE SCENARIOS**

This method of valuation was useful as a first cut. But Krishnuvara was a trained engineer who understood that there was lot of risk in the new venture. He knew that the venture could evolve along a variety of scenarios. One was indeed a very good scenario, in which the company would go public for $140 million after four years. Another was an intermediate scenario, in which the company would be acquired after four years for $60 million. And then there was that much-dreaded scenario of failure, in which the company would be worth nothing at all.
While the founders all agreed that these were three reasonable scenarios, they disagreed about the relative likelihood of the scenarios. They agreed to use a base discount rate of 45 percent. But on top of this discount rate, a proper risk-adjustment was needed. On this, the three founders could not agree. To resolve their differences, they decided to model their expectations a little more carefully.

- Annabella thought that if the company survived for four years, the IPO scenario would occur with a probability of 80 percent, and the acquisition scenario with a probability of 20 percent. Her main worry was survival, and she thought the probability of failure was as high as 15 percent per year.
- Krishnuvara agreed with most of Annabella’s assessment, but thought that the probability of failure was not quite as high, probably around 10 percent per year.
- Bob, finally, thought that a 10 percent failure rate was realistic, but he considered the acquisition scenario more likely and gave the IPO and the acquisition each a 50 percent chance.

**Question 2a:** The founders wanted to find out what their shares would be worth under these different expectations. They first assumed that they would take the deal that Vulture Ventures had offered. They assumed that the Series B round would occur at $2 a share for $2 million. What would the founder’s NPV value be according to Annabella, Krishnuvara, and Bob?

**Question 2b:** The founders also wanted to see what would happen if instead of the current deal, the investors were to agree with either of the three founders’ scenarios and price the deal accordingly. In other words, what valuations do these three different expectations imply?

**Question 2c:** A friend of Bob, called Gary Gloom, also looked at these numbers, but thought that the probability of failure was as high as 30 percent per year. What NPV and valuation would be implied by his expectations?

**SECTION 3: VESTING AND FOUNDER REPLACEMENT—BIG PIES AND SMALL SLICES**

The three founders initially thought that they would get their 5 million shares immediately, an idea that they seemed to like quite a lot. The disappointment was therefore even larger when they found out the true meaning of the word “vesting.” It had little to do with fashion clothes, but instead meant that they would only own their shares over time. Being of a suspicious nature, they wondered what could go wrong.

Krishnuvara was particularly concerned. He was going to be the CEO, and the founders had agreed that as the CEO, he was to receive 2 million shares, whereas Annabella and Bob were to receive 1.5 million shares each. While Annabella and Bob were sure about being able to stay with the company for as long as they wanted, Krishnuvara was concerned that he would be taken out of the company in favor of some gray-haired guy in a suit, or what Sand Hill called a “professional” CEO.

Krishnuvara formulated the following expectations about the company. After two years SpiffyTerm, Inc. would need to raise an additional $2 million. The company would be able to
achieve an IPO in four years, with a valuation of $80 million. Investors would require a 60 percent discount rate. This was based on the assumption that he would be the CEO. Grudgingly he also agreed that having a professional CEO would reduce the risk of the new company. In fact, the reduced risk would be reflected in a discount rate of 45 percent for the third and fourth year.

Krishnuvara thought he had to choose between two very different scenarios, one in which he was the CEO throughout, and one in which a new CEO would be brought in. He also thought that in order to remain the CEO throughout, he had to have control over the board of directors. With control, he could resist the pressure to bring in another CEO, and this way he would be able to safely vest all of his stock. Without control, he thought that after two years, Wolf C. Flow would kick him out of the company, personally, and with a grin on his face. According to the term sheet he would own only 1.5 million shares of his 2 million shares after two years. The remaining 0.5 million shares, he suspected, would be put into the option pool, for others to enjoy (like that smooth-talking, gray-haired CEO who would get to sit in his leather chair).

**Question 3a:** Assume that the first round will occur at $1 per share for Vulture Venture’s $4 million investment. Using all of Krishnuvara’s assumptions, calculate his final wealth and the NPV of it, both if he controls and does not control the board. Based only on those numbers, should he prefer to retain control? Also calculate the same numbers for Annabella, Bob, and Vulture Ventures. What control structure would they prefer?

**Question 3b:** How does your answer change when you re-price the first round; i.e., if you allow the price of the first round to vary across the two control structures? Comment on your findings, focusing on the issue of getting a smaller slice of a bigger pie.

**Question 3c:** Is Krishnuvara correct in his assumption about control and the role of the board? (You don’t need to make any calculations for this part!)

**SECTION 4: PREFERRED STOCK**

The previous calculations assumed that SpiffyTerm, Inc. would achieve its goal to go public in four years. Secretly, the founders were also interested in finding out what would happen if their performance would be less than stellar. In this case, they suspected that the structure of preferred equity would become relevant.

The term sheet specified that the Series A investors invest $4 million, and that they have rights to a dividend of $0.08 per share. This accrues annually, but unlike an interest rate there is no compounding. Suppose again that the founders made the following assumption. There will be a second round of finance after two years for $2 million at $2 per share. The Series B investors will receive basically the same term sheet, except that they receive a dividend of $0.16 per share. Series A and B investors also have equal seniority status.

There are several types of preferred equity that are all hybrid securities that behave sometimes like debt and sometimes like equity. SpiffyTerm, Inc.’s term sheet used a particular security that is called “participating preferred equity.” In order to understand how this works, it is useful to
first consider a simpler instrument, which is “plain preferred equity.” For the latter, the investors have a choice in case of liquidation and redemption (including an acquisition, but not an IPO). They can ask to get their investment back, together with the accrued dividend. Or they can choose to convert, in which case they forgo any debt-like claim and hold straight equity. In case of an IPO, conversion is automatic.

**Question 4a:** Suppose that all investors hold plain preferred equity. Suppose that the firm is acquired after four years. At the time of the acquisition, calculate the value of the first round investors if they do and don’t convert their preferred equity. Then do the same for the second round investors. Consider the following acquisition prices for the firm: $5 million, $10 million, $20 million, $30 million, $49 million, and $51 million.

Hint: You will need to calculate the percentage ownership of the Series A and Series B investors after four years to answer this question. For a first pass you can calculate the value of the securities under the scenario in which both A and B convert, and the scenario in which neither A nor B convert. For a completely accurate answer, however, you also need to consider the cases in which only Series A or only Series B converts.

**Question 4b:** At what acquisition price are Series A investors indifferent about converting or not? And at what acquisition price are Series B investors indifferent about converting or not? Be careful that Series A investors may have a different ownership stake after conversion if Series B investors don’t convert!

Unfortunately, Vulture Ventures was not asking for plain preferred equity, but for something called “participating preferred equity.” This is different from “plain preferred equity” in the following way. Plain preferred equity is essentially either debt or equity. In contrast, participating preferred equity is both debt and equity. With participating preferred equity, the investors first get their money back plus accrued dividends. After that, they participate in any remaining value according to their percentage equity.

There are two additional twists to participating preferred equity. First, there is a cap on the valuation of the company. In the case of SpiffyTerm, Inc., this is $50 million. If the value of the firm goes above this cap, then the participating preferred equity automatically converts to straight equity. Similarly, if the company goes public, there is also an automatic conversion to straight equity.

**Question 4c:** Suppose that all investors hold participating preferred equity. Suppose again that the firm is acquired after four years. Calculate the value of the first round and second round investors at that time. Again, consider the following acquisition prices for the firm: $5 million, $10 million, $20 million, $30 million, $49 million and $51 million. Do the investors ever want to convert?

**Question 4d:** Suppose that at the time of the acquisition, Wolf C. Flow is bargaining with the acquirer. Does he prefer an acquisition price of $49 million or $51 million? What could the founders of SpiffyTerm, Inc. do to persuade him to change his bargaining stance?
SECTION 5: PRICING OF FOLLOW-UP ROUNDS AND THE RIGHT OF FIRST REFUSAL

The founders had some further concerns about how the second round of financing would work out. To keep things more tractable, they decided to ignore issues of preferred equity and treat all securities on an “as-if converted” basis. On the assumption that they would take Wolf C. Flow’s deal, there would be 10.5 million shares, 4 million shares owned by Vulture Ventures, 5 million shares owned by the founders, and 1.5 million shares owned by employees. For the second round of financing, Vulture Ventures had already mentioned that they would want to bring in another venture capital firm with the trust-inspiring name of Crow Capital.

Annabella wanted to see how prices would be set in the second round. She assumed that the total investment amount would be $2 million. However, she wasn’t sure how much of this would be provided by Vulture Ventures or Crow Capital. She thought that Vulture Ventures would invest either $0.5 million or $1 million. After agreeing on the amount, she thought that the price of shares would be either $2 or $2.5 per share. There were thus four possible bargaining outcomes:

- Outcome 1: Vulture Ventures invests $0.5 million, Crow Capital invests $1.5 million, price per share is $2.
- Outcome 2: Vulture Ventures invests $0.5 million, Crow Capital invests $1.5 million, price per share is $2.5.
- Outcome 3: Vulture Ventures invests $1 million, Crow Capital invests $1 million, price per share is $2.
- Outcome 4: Vulture Ventures invests $1 million, Crow Capital invests $1 million, price per share is $2.5.

Annabella was indifferent about how Vulture Ventures and Crow Capital split the $2 million. But she wondered how this first choice of investment amounts would affect the subsequent choice of the price per share? Since she wasn’t sure who would be setting the price, she envisioned three scenarios.

- In the first scenario, the founders would control to price.
- In the second scenario, Crow Capital would control the price.
- In the third scenario, Vulture Ventures would control the price.

Question 5a: For each of the four outcomes, calculate the pre- and post-money valuation of the firm, as well as the ownership stakes of all parties.

Question 5b: Now consider each of the three price-setting scenario. Suppose that Vulture Ventures invested $0.5 million. What price would you expect for each of the three scenarios? How does your answer change if Vulture Ventures invested $1 million?

Bob suggested that instead of investing $0.5 million for $1 per share, Vulture Ventures should invest according to the “right of first refusal” clause, in which the first round investor invested in the second round according to its pro rata share; i.e., Vulture Ventures should take up $4 / 10.5 ≈ 38.10 percent of the second round, which would amount to approximately $0.76 million.
Question 5c: How does your answer to 5b change if Vulture Ventures made a pro-rata investment?

SECTION 6: ANTI-DILUTION

So far the founders had looked at cases in which after two years the second round would happen at a premium to the first round. They also wanted to know what would happen in a so-called “down-round,” in which the share price falls below the previous round. They realized that anti-dilution clauses would then kick in. Exhibit 2 at the end of the case explains how anti-dilution clauses work.

They considered again the situation in which there are 10.5 million shares—4 million shares owned by Vulture Ventures, 5 million shares owned by the founders, and 1.5 million shares owned by employees. The founders wanted to examine the following situation, which they projected to occur after two years. At that time they would require an additional $5 million, and they would need another four years to be acquired. The acquisition at the end of year six was then projected to occur at a valuation of $60 million. Investors would use a 45 percent discount rate throughout. Starting in year two and projecting forward, using the standard valuation model with a single round, the founders calculated that the price per share for the second round would be $0.82 and the pre-money-valuation would be $8,573,106. This was a lower price per share than the original round of $1 per share. As a consequence, the anti-dilution clause would now have to come into play. While the founders understood the information in Exhibit 2, they still disagreed about how they should set up their calculations.

Question 6a: Krishnuvara suggested the following. Using the standard valuation model, Krishnuvara saw that the price of the new round would be $0.82. He therefore took this price per share, and used it to calculate the price adjustments for the two types of anti-dilution provisions. Which anti-dilution clauses do the Series A investors prefer? What about the Series B investors?

Question 6b: Annabella took issue with Krishnuvara’s calculations. She argued that if the Series A investors would be given additional shares, as part of the anti-dilution clause, then the Series B investors would want to revise their own calculation. She therefore wanted to do a more complicated calculation whereby Series B investors would price the new round according to the usual valuation model, taking into account that the Series B price would affect the adjusted Series A price, and thus the number of shares for Series A investors. What price per share does Annabella find for the two anti-dilution clauses? Which anti-dilution clauses do the Series A and Series B investors prefer now?
Exhibit 1
Term Sheet

SPIFYTERM, INC.
SERIES A PREFERRED STOCK FINANCING
SUMMARY OF TERMS

I. INTRODUCTION

SpiftyTerm, Inc. (the “Company”) is a California corporation. The Company currently has 5,000,000 shares of Common Stock outstanding, which are held by the founders, Annabella Labella, Krishnunvarra Ramakrishna, and Bob Sledge. The Company desires to authorize 4,000,000 shares of Series A Preferred Stock (“Series A Preferred”) and to issue and sell these shares to the investors, Vulture Ventures, on the terms and conditions set forth below.

II. TERMS OF FINANCING

Amount of Financing.  $4,000,000

Securities.  4,000,000 shares of Series A Preferred

Price.  $1.00 per share ($6,500,000 pre-financing valuation, assuming an employee and consultant stock pool of 1,500,000 shares of Common Stock)

Investors.  Vulture Ventures

Terms of Series A Preferred:

Dividend Rights  Holders of Series A Preferred are entitled to accrued (but not compounded) dividends at the rate of $.08 per share, payable as and when declared by the Board of Directors, in preference to dividends paid on the Common Stock.

Liquidation Preference

The Series A is participating preferred stock. On any liquidation, dissolution, or winding up of the Company, the holders of Series A Preferred shall be entitled to receive, in preference to holders of Common Stock, an amount equal to $1.00 per share plus any declared but unpaid dividends, in preference to any distribution to the holders of Common Stock. After this distribution, any remaining assets shall be distributed to the holders of Common Stock and the holders of Series A stock on an as-converted basis. A merger in which the shareholders of the Company do not control the surviving corporation or the sale of substantially all of the assets of the Company shall be treated as a liquidation. Participating preference goes away on valuation
that corresponds to $50 million and above. In this case, Series A becomes plain preferred stock. Prior to conversion this commands repayment of stock plus dividends. In case of conversion, these preferential rights disappear and Series A stock becomes equal to common stock.

Conversion Right

Each share of Series A Preferred is convertible at any time at the option of the holder into one share of Common Stock, subject to the automatic conversion provisions described below.

Automatic Conversion

Each share of Series A Preferred shall be automatically converted into Common Stock upon (i) the approval of holders of a majority of the outstanding Series A Preferred, or (ii) the consummation of the Company’s sale of Common Stock in an underwritten public offering (“IPO”) at a per share offering price of not less than $5.00 per share and an aggregate offering price of not less than $15,000,000.

Anti-Dilution Protection

The conversion rate of Series A Preferred is subject to proportionate adjustment in the event of stock splits, stock dividends, reclassifications and the like, and to adjustments on a formula basis (based on the weighted average price of the Company’s stock issued or deemed issued), in the event of any future issuance of securities at a price per share less than the current conversion price of Series A Preferred (initially $1.00 per share), subject to customary exceptions, including the issuance of Common Stock to employees, officers, employees, and consultants as approved by the Board of Directors. Anti-dilution is subject to a “pay to play” provision.

Redemption

The Series A Preferred is not redeemable.

Voting Right

The approval of holders of a majority of the outstanding Series A Preferred shall be required for (i) any action that alters the rights, preferences, or privileges of the Series A Preferred, (ii) the authorization of additional Preferred Stock or other capital stock senior to or in parity with Series A Preferred, and (iii) any sale of the Company, through a merger or sale of assets. On all other matters, except as required by law, holders of Series A Preferred and Common Stock shall vote together, with the holders of Series A Preferred voting on an as-converted basis.

Board of Directors

The Board of Directors shall be set at five directors, with holders of the Series A Preferred having the right to elect two directors and the holders of the Common Stock having the right to elect the remaining directors, one of which shall be an independent director nominated by the Investors and reasonably satisfactory to the Founders. After the Closing the Board of Directors
shall consist of Annabella Labella, Krishnuvara Ramakrishna, Wolf C. Flow, Wei T. Late, and the independent director to be nominated.

Closing

On or about January 4, 2000.

Representations

Customary representations and warranties, including the accuracy of the Company’s financial statements, the absence of material undisclosed liabilities, title to assets, etc.

Closing Conditions

Customary closing conditions for a venture capital financing, including delivery of a customary legal opinion, receipt of all necessary governmental approvals, etc.

Founder Vesting and Option Pool Vesting

The Founders shall have agreed to grant the Company an option to repurchase a portion of their Common Stock at cost upon termination of their employment with the Company for any or no reason. Founder’s shares vest 25 percent on closing, with the remainder vesting linearly over a thirty-six-month period. The option of 1,500,000 shares is to have a forty-eight-month vesting with a twelve-month cliff and linear vesting thereafter.

Expenses

If the financing closes, the Company shall pay the reasonable fees and expenses of special counsel for the Investors, up to a maximum of $10,000.

Reports

The Company shall furnish each Investor with annual audited financial statements and, for Investors holding more than 500,000 shares of Common Stock on an as-converted basis (“Major Investors”), with unaudited monthly financial statements and annual budgets. The Major Investors shall also be entitled to customary inspection rights. These rights shall expire upon completion of the Company’s IPO.

Right of Participation / Right of First Refusal

The Major Investors shall have the right to participate in future financings in proportion to their pro-rata ownership of Common Stock (calculated on an as-converted basis), subject to customary exceptions (including shares issued pursuant to acquisitions, equipment leasing arrangements, and employee stock plans). These rights shall expire upon completion of the Company’s IPO.

Registration Rights
(A) Two demand registrations by holders of not less than 50 percent of the Series A Preferred (and/or Common Stock issued upon conversion thereof), provided that the shares requested to be registered must represent at least 25 percent of the outstanding registrable securities and have an aggregate expected public offering price of not less than $5,000,000. No demand may be made prior to six months after the effective date of the Company’s IPO.

(B) Unlimited “piggyback” registration rights, subject to customary underwriter cutback provisions that shall allow for 100 percent cutback in the case of the IPO and cutbacks of 30 percent of the offering in subsequent transactions. The Founders shall have piggyback rights subordinate to the holders of Series A Preferred with respect to their shares of Common Stock.

(C) Unlimited Form S-3 (short form) registrations after the Company qualifies for the use of such form. Registrations may not be required more often than once within any twelve-month period or for offerings of less than $1,000,000.

(D) All registration expenses shall be borne by the Company, including fees and disbursements of one special counsel for the selling shareholders, subject to customary exceptions for withdrawn registrations.

(E) Each holder of registrable securities shall agree to a lock-up of 180 days from the effective date of any public offering, subject to the execution of similar lock-ups by the Company’s officers and directors.

III. POST-FINANCING CAPITALIZATION

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Exhibit 2
Anti-Dilution

There are two main types of anti-dilution clauses, the full ratchet and the weighted average anti-dilution. To explain them, consider the following simple example:

- Founders have 2 million shares.
- The Series A investor invested $1 million at $2 per share, originally obtaining 0.5 million shares.
- In a Series B financing, new investors invest $3 million at $1 per share, obtaining 3 million shares.

In a full ratchet, the price of the old round is simply reset to the price of the new round. In the example, the full ratchet anti-dilution adjusts the Series A price down to $1 as well, so that the Series A investors’ shares are adjusted to be $1 million / $1 = 1 million shares.

In a weighted average clause, the price of the Series A round is adjusted according to a slightly more complicated formula.

- PAO is the original price of Series A: $2 in the example.
- PB is the price of the new Series B round: $1 in the example.
- N number of all preexisting shares (from both the investors and entrepreneur): 2.5 million shares in the example.
- NB number of shares issued in the new round: 3 million shares in the example.
- IB is the amount invested by Series B investors: $3 million in this example.
- PAA is the adjusted price of Series A: this is determined by the following equation:

\[
PAA = \frac{PAO \times N + IB}{N + NB} = \frac{2 \times 2.5M + 3M}{2.5M + 3M} = 1.45
\]

The Series A investment of $2 million now gives the investor a total of $1 million/$1.45 = 689,655 shares.