Chapter 7. Revenue Forecasting

Questions and Problems

1. Consider the following pattern of historical sales growth rates of a venture that began operation seven years ago:

	Year -6	Year -5	Year -4	Year -3	Year -2	Year -1
Sales Growth (%)	223%	127%	174%	59%	90%	43%

   a. Use exponential smoothing to derive year-zero sales growth forecasts. Consider some values of α between 0.2 and 0.8 and generate forecasts for growth from Year –1 to Year 0.

   b. Given the historical pattern of sales growing at a generally decreasing rate, what do you think of exponential smoothing as a technique for forecasting sales in a situation such as the one depicted? What problems do you see?

2. A new cable venture, Digital Solutions Inc. (DSI), is evaluating a potential market and has gathered the following data on comparable companies:

Company	Year	Services Offered*	Market Penetration	Subscribers (000s)	Revenue (million)
Tri-County Cable	1997	TV	32%	45	$27.7
Digicast Inc.	2000	TV,INT	41%	5	$3.1
Sky Signal Inc.	2008	TV,INT,T	50%	143	$187.7
MidTel Cable Co.	2009	TV,INT,T	58%	58	$72.8
Fairway Communications	2010	TV,INT,T	62%	677	$1,058.0

* - TV = television; INT = Internet; T = telephone

   The new venture will serve a population of 25,000 households and will offer television, Internet, and telephone services to customers.

   a. Use the data above to estimate the potential annual revenue of the new venture.

   b. What assumptions are critical to your estimate? How might you validate them?

3. Digital Solutions Inc. (DSI) has developed a targeted strategy for the new market from Question 2. With fewer people still using landline phones, they are going to offer a high-end package that includes a large number of high-definition television channels and ultra-fast broadband Internet. DSI salespeople will use demographic data to target the 40% of the households most likely to be interested in the new service. Based on focus groups, they estimate 75% of the targeted customers will ultimately subscribe, with an average monthly price of $160.

   a. Use the data above to estimate the potential annual revenue of the new venture.

b. What assumptions are critical to your estimate? How might you validate them?

4. Digital Solutions Inc. (DSI) is concerned about the accuracy of their estimates in Question 3. Specifically, they wish to use sensitivity analysis to evaluate the impact on revenue of the following:

   a. Variations in 5% increments between 60% and 90% in the proportion of targeted households that ultimately subscribe (that is, 60%, 65%,…, 85%, 90%)

   b. Variation in $10 increments between $130 and $190 in the average monthly price (that is, $130, $140,…, $180, $190)

5. Digital Solutions Inc. (DSI) from Questions 2 and 3 wishes to evaluate the impact on revenue of the following two scenarios:

   a. New market research suggests that 55% of the households are likely to be interested in the new service. DSI develops a marketing and sales strategy that will ultimately convert 80% of likely customers to subscribers with an average monthly price of $170.

   b. The targeted market (40% of the households) turns out to be less receptive to DSI's new service than anticipated. Just 50% of those targeted subscribe, and only after the average monthly price is reduced to $140.

6. **SIM** Digital Solutions Inc. (DSI) from Questions 2 and 3 wants to use simulation to assess the uncertainty around the revenue forecast for the potential new market. Specifically, they want to compare the following strategies:

   a. Sell a standard package that includes television with some HD channels, average speed Internet service, and basic telephone. Market penetration – based on 25,000 households – is normally distributed with a mean of 55% and a standard deviation of 10%. Average monthly revenue per subscriber is represented by a triangular distribution with minimum, most likely, and maximum values of $70, $110, and $130.

   b. Offer the premium TV/Internet package described in Question 3. Of the 25,000 households, 40% will be targeted with an aggressive sales and marketing campaign. The expected percentage of subscribers from this group is normally distributed with a mean of 75% and a standard deviation of 10%. Average monthly revenue per subscriber is represented by a triangular distribution with minimum, most likely, and maximum values of $135, $160, and $175.

   c. Calculate the mean and standard deviation of estimated revenue for each strategy. Which do you think is riskier? Why?

7. You have developed and patented a new kind of felt for the outer coating of tennis balls that never wears out but, remarkably, does not affect how the balls play. To capitalize on the innovation, you also have developed new tennis ball packaging that will enable players to repressurize the container after each use. As a result, the tennis balls you plan to manufacture can last up to five times as long (in terms of playing time) as traditional tennis balls. Because of the innovations, you need to sell the balls for three times the current price of tennis balls.

   a. Develop a simple model of the market for tennis balls and explain how you might go about calibrating the various assumptions you must make so that you can estimate the total size of the market.

   b. Certain "purists" and people who only want to play with clean tennis balls are unlikely to switch from traditional tennis balls. Many other individuals play only rarely. Existing manufacturers

may respond to your entry by cutting prices. Develop a model of your share of the market for tennis balls. How might you calibrate the assumptions of the model?

8. Take Five Systems, a new start-up, is developing a new *iPhone* application ("app") and provides you with the following assumptions:
   a. Development and testing of the new app will take four months. Month five is the first month of revenue generation.
   b. Initial monthly app sales of 5,000 downloads at a price of $2.99
   c. Unit sales will grow at 15% per month for months six through twelve and then will be flat thereafter
   d. The app will become obsolete and will need to be revised/replaced after month 18

   Use the data provided to forecast Take Five's monthly revenue for Months 1-18
9. Take Five Systems is concerned about the accuracy of their revenue estimates in Question 8. Specifically, they wish to use sensitivity analysis to evaluate the impact on Month 18 revenue of the following:
   a. Variations in the growth rate of unit sales in 2% increments between 9-21% in Months 5-12 (that is, 9%, 11%,…, 19%, 21%)
   b. Variation in the level of initial sales in 500 unit increments between 2,500 and 7,500 (that is, 2,500, 3,000,…, 7,000, 7,500)
10. Take Five Systems from Question 8 wishes to evaluate the impact on revenue of the following two scenarios:
    a. Development takes just two months, so revenue begins in Month 3. The earlier market entry allows Take Five to price the app at $3.99. Initial sales are 4,000 units, unit sales grow at a 17% rate through Month 12 (month 4 through 12) and are flat thereafter through month 18.
    b. Development takes seven months and competitors are already in the Apple store. Take Five is forced to price their app at $1.99 and initial sales (Month 8) are only 3,000 units. This number grows by 10% per month, but only for six months (Months 9-14), before flattening out for the last four months.
11. **SIM** Take Five from Question 8 wants to use simulation to assess uncertainty around the revenue forecast for their new iPhone app and provides the following assumptions:
    a. Development can occur in any of Months 2-10 with equally likely probability (revenue could begin in any of Months 3-11)
    b. The initial sales price will be determined by the month of development as follows:

       Month 2-4: $3.99 Month 5-7: $2.99 Month 8-10: $1.99
    c. Initial monthly sales have a triangular distribution with minimum, most likely, and maximum values of 2,000, 5,000 and 7,000.
    d. Unit sales growth occurs until the end of Month 12 regardless of the development month. Thus, if development is completed in Month 6, there will be five months of unit sales growth (Months 8-12). If development does not occur until Month 10, there will only be one month of unit sales growth (Month 12). The monthly growth rate is normally distributed with a mean of 12% and a standard deviation of 4%.

Calculate the mean and standard deviation of Take Five's estimated cumulative revenue over the 18-month app product cycle. If Take 5 estimates the total cost of developing and supporting the app to be $500,000, what is the probability that Take Five will be profitable (i.e., that cumulative revenue is greater than the total estimated cost)?