Rationale:

The following assignment was selected from the Finance class. It shows some of the skills and competencies I have learned in the Biostatistics domain of public health. It is an example of several different assignments that were completed during the class. In each assignment, we were given a scenario and then problems to solve based on it. I had to select the correct formulas for the task, run calculations, and then make conclusions based on the results. I had to think about each scenario and the requirements for using a particular formula, and then apply the correct one for each task. This shows an ability to think about different scenarios, apply the right techniques, and then interpret the results correctly. This could fit with the competencies on having the ability to distinguish among different measurement and the implication for the method selected and applying the correct method for the study involved--while this example is not about statistics, it still requires the ability to make choices between different possible formulas/methods that could be selected based on the scenario/design being studied and then apply those techniques. This example also shows an ability to interpret results.

Assignment 1:

Week 3 Group Calculations - 5.7

General Hospital, a not-for-profit acute care facility, has the following cost structure for its inpatient services: fixed costs - $10,000,000; variable cost per inpatient day - 200; charge (revenue) per inpatient day - 1,000. The hospital expects to have a patient load of 15,000 inpatient days next year.

- Construct the hospital's base projected P & L statement.
- What is the hospital's breakeven point?
- What volume is required to provide a profit of $1,000,000? A profit of $500,000?
- Now, assume that 20% of the hospital's inpatient days come from a managed care plan that requests a 25% discount from charges. Should the hospital agree to the discount proposal?

Note: Contribution margin = unit revenue – unit variable cost = 1000-200 =800

Answer:

Base P&L statement

Total Revenues = price * volume = $1,000*15,000 = $15,000,000

Total Variable Costs = cost * volume = $200*15,000 = $3,000,000

Total Contribution Margin = (unit revenue – unit variable cost)*volume = (1,000-200)*15,000 = 800*15,000 = $12,000,000

Fixed Costs = $10,000,000

Profit = Total contribution margin – fixed costs = $12,000,000 - $10,000,000 = $2,000,000
Breakeven point

Breakeven point = Total revenues – total variable costs – fixed costs = 0

= ($1,000*volume) – ($200*volume) – ($10,000,000) = 0

= (1,000-200)*vol = 10,000,000

= vol = 10,000,000/800

Inpatient days = 12,500

Profit target $1,000,000

Profit target = (contribution margin*volume) – fixed costs

1,000,000 = 800*volume – 10,000,000

11,000,000 = 800*volume

Inpatient days = 13,750

Profit target $500,000

Profit target = (contribution margin*volume) – fixed costs

500,000 = 800*volume – 10,000,000

10,500,000 = 800*volume

Inpatient days = 13,125

Discount Proposal:

Managed Care Plan (MCP) inpatient days = total inpatient days*20% = 15,000*0.20 = 3,000 inpatient days are from the MCP

MCP discount = full price*discount = 1,000*25% = $250; so MCP patients would pay $750 per inpatient day

P&L Statement

Undiscounted revenue (non-MCP patients) = ($1,000*12,000) = $12,000,000

Discounted revenue (MCP patients) = ($750*3,000) = $2,250,000

Total Revenues = $14,250,000

Total variable costs = $3,000,000

Total Contribution Margin = $11,250,000

Fixed costs = $10,000,000

Profit = $11,250,000 - $10,000,000 = $1,250,000
Agree to Proposal:

If the hospital agrees to the proposal, they will lose $750,000 in profit. This is a lot of money to lose. I think there are some other questions that would need to be resolved before agreeing to this. First, is the $1,250,000 enough of a profit target for the not-for-profit hospital to replace equipment, get new equipment, and keep up with technology? If so, then it might be worth considering. The next question is--the MCP is 20% of the inpatient days, are there other third party payers that use a similar amount of days? If so, that could be a problem. If we give the MCP this discount, the other payers will likely find out and request similar deals. If there isn't anyone close to the 20% and there is some concern that the MCP may go elsewhere, it might be worth considering the discount. However, maybe some negotiation could be done. The hospital could offer a 10% discount and then offer an additional 10% discount if they bring in at least 1,000 more inpatient days. A similar discount could be offered to other payers that are bringing in close to 20% of the inpatient days. Of course, some analysis would have to be done to determine if an extra 1,000 inpatient days is enough to offer a 10% discount or if it should be more.

Assignment 2:

Week 6 Group Calculations - 10.3

10.3:

You have been asked to evaluate the proposed acquisition of a new clinical laboratory test system. The system's price of $50,000, and it will cost another $10,000 for transportation and installation. The system is expected to be sold after here years because the laboratory is being moved at that time. The best estimate of the system's salvage value after three years of use is $20,000. The system will have no impact on volume or reimbursement (and hence revenues), but it is expected to save $20,000 per year in operating costs. The not-for-profit business's corporate cost of capital is 10% and the standard risk adjustment is 4 percentage points.

a. What is the project's new investment outlay at Year 0?
b. What are the project's operating cash flows in Years 1, 2 and 3?c. What is the terminal cash flow at the end of Year 3?

If the project has average risk, is it expected to be profitable?

Answer:

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<th>1</th>
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<tbody>
<tr>
<td>System Cost</td>
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<tr>
<td>Installation &amp; transportation</td>
<td>($10,000)</td>
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<tr>
<td>Total Cost</td>
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<td>Salvage Value</td>
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<tr>
<td>Net Cash Flow</td>
<td>($60,000)</td>
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<td>$40,000</td>
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</tbody>
</table>
A. New Investment Outlay = system cost + installation & transportation cost at year 0 or total cost = ($60,000)

B. Operating Cash Flow in Year 1 and Year 2 is $20,000 each year because even though there was no revenue from the system it is projected to save $20,000 in operating costs. In year 3 the cash flow = operating cost savings + salvage value = $40,000

C. Terminal Cash Flow = final amount or end of year 3 = (60,000) + 20,000 + 20,000 + 40,000
   = (60,000) + 80,000
   Terminal Cash Flow = $20,000

**Average risk, is it profitable?**:

Average risk means that we use the corporate cost of capital as our discount rate, thus 10%.

<table>
<thead>
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<th>project X cost of capital</th>
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<td>Cash flow 0</td>
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<tr>
<td>Cash flow 2</td>
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<tr>
<td>Cash flow 3</td>
<td>40,000</td>
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</table>

Using Excel:

NPV = NPV(project cost of capital, Cashflow1:Cashflow3) + cashflow0

IRR = IRR(cashflow0:cashflow3, project cost of capital)

NPV = $4,763.34

IRR = 14%

The NPV a positive value of almost $5,000 shows that the project is expected to be profitable. The IRR of 14% is above the corporate cost of capital which indicates that the project is profitable (surplus expected) with a decent safety margin, so is probably not too risky.

**Assignment 3:**

**Week 4 Group Calculations - 7.3**

7.3:

Fargo Memorial Hospital has annual patience service revenues of $14,400,000. It has two major third-party payers, and some of its patients are self-payers. The hospital’s patient accounts manager estimates that 10% of the hospital’s billings are paid (received by the hospital) on Day 30, 60% are paid on Day 60, 30% are paid on Day 90. (Fiver percent of total billings end up as bad debt losses, but that figure is not relevant to this problem.)
a. What is Fargo's average collection period (assume 360 days per year throughout this problem)?
b. What is the hospital's current receivables balance?
c. What would be the hospital's new receivable balance if a newly proposed electronic claims system resulted in collecting from third-party payers in 45 and 75 days, instead of in 60 and 90 days?
d. Suppose the hospital's annual cost of carrying receivables is 10%. If the electronic claims system costs $30,000 a year to lease and operate, should it be adopted? (Assume that the entire receivables balance has to be financed.)

Answer:

a. Average Collection Period (ACP) = (% of bills paid * # of days) + (% of bills paid * # of days) +(% of bills paid * # of days) -- until percentage adds to 100%

\[ ACP = (0.10*30) + (0.60*60) + (0.30*90) \]
\[ = 3+36+27 \]
\[ ACP = 66 \text{ days} \]

b. Average daily billings = annual revenues/year (360 day year is assumed)
Receivables balance = average daily billings * ACP
\[ = (14,400,000/360)*66 \]
\[ = 40,000*66 \]
Receivables balance = $2,640,000

c. ACP = (0.10*30) + (0.60*45) + (0.30*75)
\[ = 3+27+22.5 \]
ACP = 52.5 days
Receivables balance = 40,000*52.5 = $2,100,000

d. Cost of carrying receivables = receivables balance (RB) * interest rate
Cost of (RB-b) = 2,640,000*0.10 = $264,000
Cost of (RB-c) = 2,100,000*0.10 = $210,000
Cost savings = Cost of (RB-b) – (Cost of (RB-c) + cost to lease/operate)
\[ = 264,000 – (210,000 + 30,000) \]
\[ = 264,000 – 240,000 \]
Cost savings = $24,000

The cost at current ACP is $264,000; with the new system, the cost would be $210,000 plus the cost of the equipment to lease and operate which $30,000. Even with the extra expense of the system, there is a savings to the cost of carrying the receivables of $24,000. Since the system is providing an overall cost savings, it should be adopted.