**FIN 440 LECTURE 5**

**Financial Forecasting, Planning, and Budgeting**

**CHAPTER REFERENCE – CHP 4**

What is financial forecasting –

1) Project sales revenues and expenses.

2) Estimate current assets and fixed assets necessary to support projected sales.

A financial plan outlining the revenues and expenses over a period of time. A financial operating plan (FOP) uses past performances, incomes and expenses to forecast what to expect in the following years. It then incorporates past and recent trends into the planning so as to most accurately forecast what is to come. It will define goals for areas such as budgeting, sales, payroll, etc, as well as create a cash flow projection.

**Percentage of Sales Method**

The Percentage of Sales Method is a Financial Forecasting approach which is based on the premise that most Balance Sheet and Income Statement Accounts vary with sales. Therefore, the key driver of this method is the Sales Forecast and based upon this, Pro-Forma Financial Statements (*i.e.*, forecasted) can be constructed and the firms needs for external financing can be identified. The calculations illustrated on this page will refer to the Balance Sheet and Income Statement which follow. The forecasted Sales growth rate in this example is 25%

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| Balance Sheet ($ in Millions) |
| Assets | 2013 | Liabilities and Owners' Equity | 2013 |
| Current Assets |    | Current Liabilities |   |
| Cash | 200 | Accounts Payable | 400  |
| Accounts Receivable | 400  | Notes Payable | 400  |
| Inventory | 600  | Total Current Liabilities | 800  |
| Total Current Assets | 1200  | Long-Term Liabilities |    |
|   |   | Long-Term Debt | 500 |
| Fixed Assets |    | Total Long-Term Liabilities | 500 |
| Net Fixed Assests | 800  | Owners' Equity |   |
|   |   | Common Stock ($1 Par) | 300 |
|   |   | Retained Earnings | 400 |
|   |    | Total Owners' Equity | 700 |
| Total Assets | 2000  | Total Liab. and Owners' Equity | 2000 |

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| Income Statement ($ in Millions) |
|   | 2013 |   |
| Sales | 1200 |   |
| Cost of Goods Sold | 900 |   |
| Taxable Income | 300 |   |
| Taxes | 90  |   |
| Net Income | 210 |   |
| Dividends | 70 |   |
| Addition to Retained Earnings | 140 |   |

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**Percentages of Sales**

The first step is to express the Balance Sheet and Income Statement accounts which vary directly with Sales as percentages of Sales. This is done by dividing the balance for these accounts for the current year (2013) by sales revenue for the current year.

The Balance Sheet accounts which generally vary closely with Sales are Cash, Accounts Receivable, Inventory, and Accounts Payable. Fixed Assets are also often tied closely to Sales, unless there is excess capacity. For this example, we will assume that Fixed Assets are currently at full capacity and, thus, will vary directly will sales.

Retained Earnings on the Balance Sheet represent the cumulative total of the firm's earnings which have been reinvested in the firm. Thus, the change in this account is linked to Sales; however, the link comes from relationship betwen Sales growth and Earnings

The Notes Payable, Long-Term Debt, and Common Stock accounts do not vary automatically with Sales. The changes in these accounts depend upon how the firm chooses to raise the funds needed to support the forecasted growth in Sales.

On the Income Statement, Costs are expressed as a percentage of Sales. Since we are assuming that all costs remain at a fixed percentage of Sales, Net Income can be expressed as a percentage of Sales. This indicates the Profit Margin.

Taxes are expressed as a percentage of Taxable Income (to determine the tax rate). Dividends and Addition to Retained Earnings are expressed as a percentage of Net Income to determine the Payout and Retention Ratios respectively.

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| **Percentage of Sales Calculations**  |
| The examples in this box illustrate the calculations which were used to determine the percentages provided in the following Balance Sheet and Income Statement.

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| **Cash** | Cash/Sales = $200/$1200 = .1667 = 16.67% |
| **Inventory** | Inventory/Sales = $600/$1200 = .5 = 50% |
| **Accounts Payable** | (Accounts Payable)/Sales = $400/$1200 = .3333 = 33.33% |
| **Costs** | Costs/Sales = $900/$1200 = .75 = 75% |
| **Taxes** | Taxes/(Taxable Income) = $90/$300 = .3 = 30% |
| **Net Income** | (Net Income)/Sales = $210/$1200 = .175 = 17.5% |
| **Dividends** | Dividends/(Net Income) = $70/$210 = .3333 = 33.33% |

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| Balance Sheet ($ in Millions) |
| Assets | 2013 | % | Liabilities and Owners' Equity | 2013 | % |
| Current Assets |    |    | Current Liabilities |   |   |
| Cash | 200 | 16.67%  | Accounts Payable | 400  | 33.33%  |
| Accounts Receivable | 400  | 33.33%  | Notes Payable | 400  | N/A  |
| Inventory | 600  | 50.00%  | Total Current Liabilities | 800  |  |
| Total Current Assets | 1200  |  | Long-Term Liabilities |    |    |
|   |   |   | Long-Term Debt | 500 | N/A  |
| Fixed Assets |    |    | Total Long-Term Liabilities | 500 |  |
| Net Fixed Assests | 800  | 66.67%  | Owners' Equity |   |   |
|   |   |  | Common Stock ($1 Par) | 300 | N/A  |
|   |   |  | Retained Earnings | 400 | N/A\*  |
|   |    |    | Total Owners' Equity | 700 |  |
| Total Assets | 2000  |   | Total Liab. and Owners' Equity | 2000 |  |

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| Income Statement ($ in Millions) |
|   | 2013 | % |
| Sales | 1200 |    |
| Cost of Goods Sold | 900 | 75%  |
| Taxable Income | 300 | 25% |
| Taxes | 90  | 30%\* |
| Net Income | 210 | 17.5% |
| Dividends | 70 | 33.33%\* |
| Addition to Retained Earnings | 140 | 66.67%\* |

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**Partial Pro-Forma**

The next step is to construct the Partial Pro-forma Financial Statements. First, determine the forcasted Sales level. This is done my multiplying Sales for the current year (2013) by one plus the forecasted growth rate in Sales.

S1= S0(1 + g) = $1200(1 + .25) = $1500

where

* S1 = the forecasted Sales level,
* S0 = the current Sales level, and
* g = the forecasted growth rate in Sales.

Once the forecastes Sales level has been determined, the Balance Sheet and Income Statement accounts which vary directly with Sales can be determined by multiplying the percentages by the Sales forecast. The accounts which do not vary directly with Sales are simply transferred to the Partial Pro-Forma Financial Statements at their current levels.

Retained Earnings on the Balance Sheet are the one item whose amount is determined using a slightly different procedure. The Partial Pro-Forma balance for Reatined Earnings equals Retained Earnings in the current year plus the forecasted Addition to Retained Earnings from the Partial Pro-Forma Income Statement. The balances for summary accounts, such as Total Current Assets and Total Current Liabilities, are determined by summing their constituent accounts.

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| **Partial Pro-Forma Calculations**  |
| The examples in this box illustrate the calculations which were used to derive the following Partial Pro-Forma Balance Sheet and Income Statement.

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| **Cash** | (Cash%)(Sales Forecast) = (16.67%)($1500) = $250 |
| **Inventory** | (Inventory%)(Sales Forecast) = 50%($1500) = $750 |
| **Costs** | (Costs%)(Sales Forecast) = 75%(1500) = $1200 |
| **Addition toRetained Earnings** | (Addition to Retained Earnings%)(Net Income Forecast) = 66.67%($262.5) = $175 |
| **Retained Earnings(Balance Sheet)** | Retained Earnings + Addition to Retained Earnings Forecast = $400 + $175 |

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| Balance Sheet ($ in Millions) |
| Assets | 2013 | 2014 | Liabilities and Owners' Equity | 2013 | 2014 |
| Current Assets |    |    | Current Liabilities |   |   |
| Cash | 200 | 250  | Accounts Payable | 400  | 500  |
| Accounts Receivable | 400  | 500  | Notes Payable | 400  | 400  |
| Inventory | 600  | 750  | Total Current Liabilities | 800  | 900  |
| Total Current Assets | 1200  | 1500  | Long-Term Liabilities |    |    |
|   |   |   | Long-Term Debt | 500 | 500 |
| Fixed Assets |    |    | Total Long-Term Liabilities | 500 | 500  |
| Net Fixed Assests | 800  | 1000  | Owners' Equity |   |   |
|   |   |  | Common Stock ($1 Par) | 300 | 300 |
|   |   |  | Retained Earnings | 400 | 575 |
|   |    |    | Total Owners' Equity | 700 | 875  |
| Total Assets | 2000  | 2500 | Total Liab. and Owners' Equity | 2000 | 2275  |

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| Income Statement ($ in Millions) |
|   | 2013 | 2014 |
| Sales | 1200 | 1500  |
| Cost of Goods Sold | 900 | 1125 |
| Taxable Income | 300 | 375 |
| Taxes | 90  | 112.5 |
| Net Income | 210 | 262.5 |
| Dividends | 70 | 87.5 |
| Addition to Retained Earnings | 140 | 175 |

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**External Financing Needed (EFN)**

The External Financing Needed (EFN) can be determined from the Partial Pro-Forma Balance Sheet. It is simply equal to the difference between Partial Pro-Forma Total Assets and Partial Pro-Forma Total Liabilities and Owners' Equity.

EFN = $2500 - $2275 = $225

**Pro-Forma Financial Statements**

The final step is to determine how the EFN is to be raised. Firms can choose to raise the EFN by borrowing on short-term basis (Notes Payable), borrowing on a long-term basis (Long-Term Debt), issuing equity (Common Stock), or some combination of the above. The chosen method is called the **Plug**.

In this example we shall assume that the EFN is to be raised through long-term borrowing. Thus the plug is Long-Term Debt. To determine the Pro-Forma Financial Statements simply increase Long-Term Debt by the EFN of $225 determined in the previous step.

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| Balance Sheet ($ in Millions) |
| Assets | 2013 | 2014 | Liabilities and Owners' Equity | 2013 | 2014 |
| Current Assets |    |    | Current Liabilities |   |   |
| Cash | 200 | 250  | Accounts Payable | 400  | 500  |
| Accounts Receivable | 400  | 500  | Notes Payable | 400  | 400  |
| Inventory | 600  | 750  | Total Current Liabilities | 800  | 900  |
| Total Current Assets | 1200  | 1500  | Long-Term Liabilities |    |    |
|   |   |   | Long-Term Debt | 500 | 500 |
| Fixed Assets |    |    | Total Long-Term Liabilities | 725 | 725  |
| Net Fixed Assests | 800  | 1000  | Owners' Equity |   |   |
|   |   |  | Common Stock ($1 Par) | 300 | 300 |
|   |   |  | Retained Earnings | 400 | 575 |
|   |    |    | Total Owners' Equity | 700 | 875  |
| Total Assets | 2000  | 2500 | Total Liab. and Owners' Equity | 2000 | 2500  |

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| Income Statement ($ in Millions) |
|   | 2013 | 2014 |
| Sales | 1200 | 1500  |
| Cost of Goods Sold | 900 | 1125 |
| Taxable Income | 300 | 375 |
| Taxes | 90  | 112.5 |
| Net Income | 210 | 262.5 |
| Dividends | 70 | 87.5 |
| Addition to Retained Earnings | 140 | 175 |

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