Week 9

FINANCIAL ANALYSIS

Economic and management principles

Review of the last lecture

IN THE LAST LECTURE, WE FOCUSED ON THE FINANCIAL PART OF A COMPANY'S DESCRIPTION

- We said that a manager's primary goal is to maximize the value of his or her firm's stock.
- Value is based on the firm's future cash flows.
- To estimate future cash flows, investors have to study financial statements that publicly traded firms must provide.
- We described the key financial statements and showed how they change as a firm's operations undergo change.

How To Use Financial Statements

- The market value of the firm's stock is not the book value that we find in financial statements, but accounting data influence stock prices.
- We will show how the financial statements are used by
  - managers to improve performance;
  - lenders to evaluate the likelihood of collecting on loans;
  - stockholders to forecast earnings, dividends, and stock prices.

How To Use Financial Statements

- Financial statements report both a firm's position at a point in time and its operations over some past period.
- However, their real value lies in the fact that they can be used to help predict future earnings and dividends.
- Financial analysis involves

  1. comparing the firm's performance to other firms, especially those in the same industry,

  2. evaluating trends in the firm's financial position over time.

- For the sake of comparison in time and across firms, the analysis most of the time involves various ratios (abstract of units and company's size).

Liquidity ratios

- Liquidity ratios show the relationship of a firm's current assets to its current liabilities
- A liquid asset is one that trades in an active market and hence can be quickly converted to cash at the going market price.
- A firm's "liquidity position" deals with this question: Will the firm be able to pay off its debts as they come due in the coming year?
- There are two main liquidity ratios - ratios that show the relationship of a firm's cash and other current assets to its current liabilities.

Liquidity ratios

- The primary liquidity ratio is the current ratio, which is calculated as:

Current ratio = Current assets/Current liabilities

- Current assets include cash, marketable securities, accounts receivable, and inventories.
- Current liabilities consist of accounts payable, short-term notes payable, current maturities of long-term debt, accrued taxes, and accrued wages.

Liquidity ratios

- The ratio indicates the extent to which current liabilities are covered by those assets expected to be converted to cash in the near future.
- If a company is getting into financial difficulty, it begins paying its bills (accounts payable) more slowly, borrowing from its bank, and so on, all of which increase current liabilities.
- If current liabilities are rising faster than current assets, the current ratio will fall, and this is a sign of possible trouble.

Liquidity ratios

- The second most used liquidity ratio is the quick, or acid test, ratio, which is calculated as

Quick ratio = Current assets – Inventories/Current liabilities

- Inventories are typically the least liquid of a firm's current assets, hence they are the assets on which losses are most likely to occur in the event of liquidation.
- Therefore, this measure of a firm's ability to pay off short-term obligations without relying on the sale of inventories is important.

Asset management ratios

- Asset management ratios measure how effectively the firm is managing its assets
- These ratios answer this question: Does the amount of each type of asset seem reasonable, too high, or too low in view of current and projected sales?
- If a firm has too many assets, its cost of capital will be too high and its profits will be depressed.
- On the other hand, if assets are too low, profitable sales will be lost.

Asset management ratios

- "Turnover ratios" are ratios where sales are divided by some asset.
- As the name implies, they show how many times the item is "turned over" during the year.
- The inventory turnover ratio is defined as:

Inventory turnover ratio = Sales/Inventories

- A low turnover ratio suggests that the company is holding too much inventory.
- Excess inventory is unproductive and represents an investment with a low or zero rate of return.

Asset management ratios

- Days sales outstanding (DSO), also called the average collection period (ACP), is used to appraise accounts receivable.
- It is calculated as

DSO = Receivables/ (Annual sales / 365)

- It represents the average length of time that the firm must wait after making a sale before receiving cash.
- High DSO signals that a number of customers are paying very late, and those customers may well be in financial trouble.

Asset management ratios

- The fixed assets turnover ratio measures how effectively the firm uses its plant and equipment.
- It is calculated as

Fixed assets turnover ratio = Sales/Net fixed assets

- Potential problem: fixed assets are shown on the balance sheet at their historical costs, less depreciation.
- Inflation has caused the value of many assets that were purchased in the past to be seriously understated.
- Therefore, if we compared an old firm with a new company with similar operations, we would probably find that the old firm had the higher fixed assets turnover ratio.

Asset management ratios

- The total assets turnover ratio measures the turnover of all the firm's assets.
- It is calculated as

Total assets turnover ratio = Sales/Total assets

- The ratio shows whether the company is generating enough sales given its total assets.
- If the ratio is too low, sales should be increased, some assets should be disposed of, or a combination of these steps should be taken.

Debt management ratios

- Debt management ratios measure the optimality of debt financing
- The extent to which a firm uses debt financing, or financial leverage, has three important implications:

  1. By raising funds through debt, stockholders can control a firm with a limited amount of equity investment.

  2. Creditors look to the equity, or owner-supplied funds, to provide a margin of safety, so the higher the proportion of the total capital provided by stockholders, the less the risk faced by creditors.

  3. If the firm earns more on its assets than the interest rate it pays on debt, then using debt “leverages”, or magnifies, the return on equity, ROE.

Example of debt leverage

FIRM U [UNLEVERAGED (NO DEBT)]

Current assets	$ 50	Debt	$ 0
Fixed assets	50	Common equity	100
Total assets	$100	Total liabilities and equity	$100

		BUSINESS CONDITIONS		
		Good	**Expected**	**Bad**
Sales revenues		$150.0	$100.0	$75.0
Operating costs	Fixed	45.0	45.0	45.0
	Variable	60.0	40.0	30.0
Total operating costs		105.0	85.0	75.0
Operating income (EBIT)		$ 45.0	$ 15.0	$ 0.0
Interest (Rate = 10%)		0.0	0.0	0.0
Earnings before taxes (EBT)		$ 45.0	$ 15.0	$ 0.0
Taxes (Rate = 40%)		18.0	6.0	0.0
Net income (NI)		$ 27.0	$ 9.0	$ 0.0
ROE_U		27.0%	9.0%	0.0%

Example of debt leverage

FIRM L [LEVERAGED (SOME DEBT)]

Current assets	$ 50	Debt	$ 50
Fixed assets	50	Common equity	50
Total assets	$100	Total liabilities and equity	$100

		BUSINESS CONDITIONS		
		Good	**Expected**	**Bad**
Sales revenues		$150.0	$100.0	$75.0
Operating costs	Fixed	45.0	45.0	45.0
	Variable	60.0	40.0	30.0
Total operating costs		105.0	85.0	75.0
Operating income (EBIT)		$ 45.0	$ 15.0	$ 0.0
Interest (Rate = 10%)		5.0	5.0	5.0
Earnings before taxes (EBT)		$ 40.0	$ 10.0	−$ 5.0
Taxes (Rate = 40%)		16.0	4.0	0.0
Net income (NI)		$ 24.0	$ 6.0	−$ 5.0
ROE_L		48.0%	12.0%	−10.0%

Debt management ratios

- The ratio of total debt to total assets, generally called the debt ratio, measures the percentage of funds provided by creditors:

Debt ratio = Total debt/Total assets

- Total debt includes all current liabilities and long-term debt.
- Creditors prefer low debt ratios because the lower the ratio, the greater the cushion against creditors' losses in the event of liquidation.
- Stockholders, on the other hand, may want more leverage because it can magnify expected earnings.

Debt management ratios

- The times-interest-earned (TIE) ratio is determined as

TIE = EBIT/ Interest charges

- It measures the firm's ability to meet its annual interest payments.
- Failure to pay interest will bring legal action by the firm's creditors and probably result in bankruptcy.
- TIE has two shortcomings:

  1. interest is not the only fixed financial charge (see e.g. Lease payments)

  2. EBIT does not represent all the cash flow available to service debt.

Debt management ratios

- EBITDA coverage ratio shows all of the cash flow available for payments in the numerator and all of the required financial payments in the denominator:

EBITDA coverage ratio = (EBITDA + Lease payments)/ (Interest + Principal payments + Lease payments)

- The EBITDA coverage ratio is most useful for relatively short-term lenders such as banks, which rarely make loans for longer than about five years.

Debt management ratios

- Over a relatively short period, depreciation-generated funds can be used to service debt.
- Over a longer time, those funds must be reinvested to maintain the plant and equipment or else the company cannot remain in business.
- Therefore, banks and other relatively short-term lenders focus on the EBITDA coverage ratio, whereas long-term bondholders focus on the TIE ratio.

Profitability ratios

- Profitability ratios show the effects of firm's characteristics on operating results
- The profit margin on sales is calculated as

Profit margin on sales = Net income/Sales

- Net income is income after interest.
- Therefore, firms that use a lot of debt will have relatively low profit margin.
- In this situation, the low profit margin would indicate a difference in financing strategies, not an operating problem.
- Note also that if a firm sets a very high price on its products, it may get a high return on each sale (high profit margin) but not make many sales.

Profitability ratios

- The ratio of net income to total assets measures the return on total assets (ROA) after interest and taxes:

ROA = Net income/Total assets

- Again, low ROA is not necessarily bad - it could result from a conscious decision to use a lot of debt, in which case high interest expenses will cause net income to be relatively low.

Profitability ratios

- The basic earning power (BEP) ratio is calculated as

BEP = EBIT/Total assets

- It indicates the ability of the firm's assets to generate operating income.
- It is useful when comparing firms with different degrees of financial leverage and tax situations.

Profitability ratios

- The “bottom-line” accounting ratio is the return on common equity (ROE), found as

ROE = Net income/Common equity

- It measures the rate of return on common stockholders’ investment.
- Companies using more debt have lower net income but also lower common equity, so the debt effect is somehow offset.
- The ROE reflects the effects of all the other ratios and is the best measure of performance in an accounting sense.

Profitability ratios

- Investors obviously like to see a high ROE, and high ROEs are generally positively correlated with high stock prices.
- However, financial leverage generally increases the ROE but leverage also increases the firm's risk, which investors dislike.
- So, if a high ROE is achieved by the use of a very large amount of debt, the stock price might well be lower than it would be with less debt and a lower ROE.
- Similarly, investors are interested in growth, and if the current ROE was achieved by holding back on research and development costs, which will constrain future growth, this will not be regarded favorably.

Market value ratios

- The market value ratios compare market values and accounting values
- The market value ratios relate the firm's stock price to its earnings, cash flow, and book value per share.
- These ratios give management an indication of what investors think of the company's risk and future prospects.
- If the liquidity, asset management, debt management, and profitability ratios all look good, and if these conditions have been stable over time, then the market value ratios will be high.

Market value ratios

- The price/earnings (P/E) ratio shows how much investors are willing to pay per dollar of reported profits:

P/E = Price per share/Earning per share

- In some industries, stock price is tied more closely to cash flow rather than net income. Consequently, investors often look at the price/cash flow ratio:

Price / Cash flow = Price per share/Cash flow per share

Market value ratios

- The market/book (M/B) ratio is calculated as

M/B = Market price per share/Book value per share;

where

Book value per share = Common equity/Shares outstanding:

- M/B ratios typically exceed 1.0, which means that investors are willing to pay more for stocks than their accounting book values.
- This situation occurs primarily because asset values, as reported by accountants on corporate balance sheets, do not reflect either inflation or “goodwill”.

Concluding remarks

- Financial ratios should be compared acrosss time and across firms
- Ratio analysis almost always involves comparisons – a company's ratios are compared with industry average figures.
- However, most firms also compare their ratios with those of leading companies.
- This technique is called benchmarking, and the companies used for the comparison are called benchmark companies.
- It is important to analyze trends in ratios as well as their absolute levels, for trends give clues as to whether a firm's financial condition is likely to improve or to deteriorate.
- To do a trend analysis, we simply plot a ratio over time.

Concluding remarks

- Ratio analysis also encounters some issues and limitations

1. Many large firms operate different divisions in different industries, and for such companies it is difficult to develop a meaningful set of industry averages.

2. Most firms want to be better than average, so merely attaining average performance is not necessarily good (benchmarking helps in this regard).

3. Inflation has badly distorted many firms' balance sheets - thus, a ratio analysis for one firm over time, or a comparative analysis of firms of different ages, must be interpreted with judgment.

Concluding remarks

4. Seasonal factors can also distort a ratio analysis. This problem can be minimized by using monthly averages of current assets and liabilities when calculating turnover ratios.

5. Firms can employ “window dressing” techniques to make their financial statements look stronger.

6. Different accounting practices can distort comparisons.

7. It is difficult to generalize about whether a particular ratio is “good” or “bad”.

8. A firm may have some ratios that look “good” and others that look “bad”, making it difficult to tell whether the company is, on balance, strong or weak.

Summary

- In this lecture, we explained how financial statements can be analyzed
- We should understand the following groups of financial ratios:
  - liquidity ratios
  - asset management ratios
  - debt management ratios
  - profitability ratios
  - market value ratios
- In the next lecture, we will talk about the time value of money.