

Financial Ratios and Financial Analysis

(with a Note on Annual Report & Accounts)

Prof. M. Shamsul Haque Ph.D¹
smhaque2005@yahoo.com

&

Raihan U. Amin MBA²
raihan.u.amin@gmail.com

NUB Working Paper No. 2

December 2013

¹Vice Chancellor
²Associate Professor
Northern University Bangladesh

NUB Working Paper No. 2
December 2013

Publisher

Northern University Bangladesh, Sher Tower, Holding #13, Road #17, Banani C/A, Dhaka-1213
Tel: 9821493-7, & 9898521

Editor

Dr. Dilruba Mahbuba
Library and Information Department
Northern University Bangladesh
mahbubadilruba@gmail.com

Foreword

The Northern University Working Paper Series is meant to serve as a practical learning tool for Masters level students. The recommended textbook(s) at times have shortcomings vis-à-vis what the tutor would ideally like the students to cover in a particular course. We hope that this gap can be plugged through explanatory materials presented in this series in easy to understand language. In other words, the Working Paper Series will give a reality check in the context of Bangladesh. Therefore, the Working Paper Series is a supplementary tool that can be drawn upon by the tutor as needed.

Northern University Bangladesh (NUB) is a government approved private university, sponsored and founded by International Business Agriculture & Technology (IBAT) Trust. The Trust is a registered, non-political, and non-profit body. Most of the members of IBAT Trust are eminent academics who felt the need for a private university to bring quality education within the reach of deserving students of modest means. In its 11 years of existence, the institution has made notable strides in the fields of law, business, computer science, public health and pharmacy.

Knowledge for Innovation and Change is our motto.

Part A

Financial analysis helps us to understand the health of a company. The two basic sources of financial data are the **income** (earnings) **statement** and the **balance sheet** (or statement of affairs). The income statement summarizes the operating results of a business firm over a period of time, such as the year ending December 31, 2012. The balance sheet is a statement of position of assets & liabilities as on a particular date, such as December 31, 2012. Along with the statement of cash flows for the 12 months ended on that date, and are known as 'financial model' of a firm as one can get a very good idea of the real business by studying these financial statements. Also, these financial statements complement each other nicely.

We are able to calculate four types of **ratios** using the financial data in the income statement and the balance sheet of a business entity:

1. Profitability ratios
2. Activity ratios
3. Leverage ratios
4. Liquidity ratios

In the following exercise we are following a fictional company MT Electronics Inc.

Profitability ratios show how profitable is the company?

Earning a surplus or profit is the main goal of a company. However, Taka amounts are not useful to indicate how profitable a company is compared with other companies in the industry and also relative to the amount of average assets used. Investors, old and new, look to profitability when: a) holding on to their investments or, b) investing in the shares of a new company. For valuation of the shares of a company or the entire company this ratio is the starting point.

The following ratios indicate profitability:

Profit as a percentage of sales is determined by: $\text{Net Profit After Taxes} / \text{Net Sales}$. Information to find the ratio as a percentage can be found in the company's

1. MT's profit as a % of sales for 2006 was Tk.....divided by Tk....., or%.
2. This represented an increase/decrease from% in 2002.
3. The fall in profitability resulted from an increase/decrease in **Cost of Goods Sold (COGS)** as a % of sales and from an increase/decrease in operating expenses as a % of sales. The only favourable factor was the decrease in the

Management and investors are more interested in the return earned on the capital invested (not including working capital) than in the profit margin mentioned above. Investors have choices to put their money in various earning assets, including bank deposits. The capital required can vary from company to company. Examples of **capital intensive** companies are in the infrastructure sector such as utilities and transport. Such industries are said to have high **entry barriers**.

Companies in the services sector such as wholesale and retail generally need less capital. Hence, it is useful to examine the return earned on the funds invested by the shareholders and by the holders of long-term debt. These parties, having taken on the risk of success or failure of the enterprise, are entitled to an appropriate rate of return. For that reason, the amount of **Earning Before charging Interest But After Taxes (EBIAT)** is used in the denominator and the owners' equity plus interest-bearing debt is used as the divisor. As we all know ratios are proportions and make comparison (across time, industries and sectors) easier.

4. MT had a total of \$.....as invested capital at year-end 2006 and EBIAT was \$.....during 2006. Its return on **invested capital** is calculated as follows:

(Earnings before interest but after taxes, EBIAT)/(Owners' Equity Plus Interest Bearing Debt)

In 2006 this figure was%, which represents an increase/decrease from.....in 2002.

From the point of view of shareholders, the relevant ratio is the **Return On Equity (ROE)** – another percentage measure obtained by dividing net profit after tax by the owners' equity: That is, (Profit after taxes/Owners' equity). Owners' equity includes initial capital invested plus all other undistributed profits accumulated over the years.

5. MT had \$.....of owners' equity and earned \$.....after taxes in 2006, an increase/decrease from the% earned in 2002.

Improvement or decline in return on equity may come in several ways. It is important to get behind the ROE numbers. Did the change come from a change in the **return on sales** (margin) or management of assets or a change in the debt ratio? These three possible explanations are combined in the Du Pont system of ratio analysis:

$$\text{ROE} = (\text{Net income}/\text{Sales}) \times (\text{Sales}/\text{Assets}) \times (\text{Assets}/\text{Equity})$$

Activity ratios: are there any hidden problems?

An enterprise accumulates assets to run its operations. Activity ratios indicate how the company uses its assets in production and trading. Poor use of assets is the primary reason for poor performance. For example, public enterprises in Bangladesh failed to make good use of their assets for a number of reasons and most of them failed to survive (for example, Adamjee Jute Mills & Khulna Newsprint Mills).

Total **Asset TurnOver (TATO)** is a measure of asset utilization and is calculated thus: Net sales/Total assets.

1. For MT, TATO ratio in 2006 can be calculated by dividing \$.....into \$.....TATO improved/declined from.....times in 2002 to.....times in 2006. It is useful to decompose the change in TATO to its component parts as described below. First, we can find out the position of accounts receivable (A/R) as collections may improve or decline over time. To do this, annual credit sales are divided by 365 to arrive at average daily credit sales. Then divide A/R by the average daily credit sales to find number of days sale un-collected: Accounts receivable/Average daily credit sale.
2. MT had \$.....invested in A/R at year-end 2006. Its average daily sales (we don't have information whether credit or cash basis) were \$.....during 2006 and its average days' sale uncollected wasdays. This indicates an improvement/deterioration in average days' sale uncollected of.....over 2002.

Another activity ratio is the **Inventory TurnOver (ITO)** ratio that indicates the efficiency in the use of inventory, both raw & finished. Inventory levels should be optimal, as too much or too low inventory is not desirable. Excessive inventory eats up capital and incurs higher costs; on the other hand, too low a level (known as **stock-out**) may result in lost business. Since inventory is reported in the balance sheet at cost, in finding usage ratio we use COGS instead of sales figure, which includes the profit mark-up. This ratio is calculated by dividing COGS by inventory at year-end. (COGS/Inventory).

3. MT had inventory of \$.....by year-end 2006 and the value of COGS during the year was \$.....Therefore, its ITO ratio in 2006 wastimes. This was an improvement/deterioration from.....times in 2002.

A fourth activity ratio is Fixed Assets Turnover (FATO) ratio, obtained by dividing net sales by net fixed assets.

4. MT had net fixed assets of \$.....and net sales of \$.....in 2006. Its FATO ratios in 2006 wastimes, an improvement/deterioration from.....times in 2002.

So far, we have discussed three measures of profitability. They are:

- A).....
- B)....., &
- C).....

We have also presented four activity (efficiency) ratios. They are:

- A)..... B).....
C)..... D).....

5. The deterioration in MT's operating profit as a percentage of total sales between 2002 and 2006 resulted primarily from

Depending on the availability of data, our analysis can be taken one step further: did the increase/decrease happen due to movements in price or volume, or both?

Leverage Ratios: How soundly is the company financed?

Leverage is a term that indicates the degree or percent of borrowed money used to finance the assets of a company. As debt capital is relatively cheaper (mostly due to tax deductibility of interest expenses), finance managers often raise capital from via banks and/or debentures. Leverage cuts both ways, hence when times are bad it increases the risk of default and may result in bankruptcy.

Debt ratio measures the total funds provided by creditors as a percentage of total assets: (Total liabilities/Total assets). Total liabilities include both current & long-term liabilities.

1. The total liabilities of MT was \$.....as of Dec. 31, 2006. As a percentage of total assets it was.....%, showing an increase/decrease from.....% as of Dec 31, 2002. Instead of the book value of capital invested, long-term lenders look into the market value where shares are listed, thus: (Total liabilities/Total liabilities + Market value of equity). The market value of equity is calculated by multiplying the number of shares with their current market price.
2. The market value of MT's equity was \$14.275 million as on Dec 31, 2006. So, the debt ratio at MV value was

A second debt ratio that relates to interest paying ability of the company from its earnings is called **Times Interest Earned (TIE)** ratio and calculated thus: (Earnings before interest & taxes/Interest expense).

3. MT's EBIT was \$.....and interest charges were \$.....in 2006. Its TIE wastimes. This shows an improvement/decline from its 2002 level oftimes.

Liquidity Ratios: Can the company pay its current debt obligations?

The fourth basic type of ratios measures the company's ability to pay those debts which are maturing within 12 months of the balance sheet date. In many cases even profitable companies face difficulties in meeting current obligations, often because their 'book' profits are tied up in receivables. Given below are two types of liquidity ratios:

Current Ratio: Current assets/Current liabilities

Quick Ratio: (Current assets-inventory)/Current liabilities

Current ratio simply means how many dollars of current assets (to be turned into cash within the next year) does the company have for every \$ of current liabilities. As a general rule of thumb, companies should aim for a Current Ratio of 2:1 and a Quick Ratio of 1:1. Quick ratio is a more stringent test because inventory is excluded from the numerator, because there may be times when inventory may not be sold quickly enough. Main reasons for a decline in liquidity ratios are: funds diversion, withdrawing profits instead of plowing it back, & ineffective working capital management.

1. MT had current assets of \$.....in 2006 and current liabilities of \$.....So, its current ratio wasThis shows an improvement/deterioration from the ratioin 2002.
2. MT's quick ratio wasin 2006 compared toin 2002, indicating an improvement/decline.

MT Electronics Inc Income Statement for the Years Ended Dec 31		
<i>Items</i>	<i>2002</i>	<i>2006</i>
Net Sales	32,500	48,800
Cost of Goods Sold	19,100	29,700
Gross Profit	13,400	19,100
Operating Expenses	10,800	16,500
Interest Expense	360	520
Income Before Taxes	2,240	2,080
Income Tax	1,000	700
Net Income	1,240	1,380

MT Electronics Inc Balance Sheet as on Dec 31		
<i>Items</i>	<i>2002</i>	<i>2006</i>
Cash	1,600	2,000
Accounts Receivable	5,200	7,400
Inventory	4,032	8,200
Current Assets	10,832	17,600
Net Fixed Assets	4,000	5,160
Total Assets	14,832	22,760
Notes Payable & Bank OD	860	1,200
Accounts Payable	1,600	2,800
Accrued Expenses & Taxes	2,000	3,500
Current Liabilities	4,460	7,500
Long-term Debt	2,700	3,000
Stock-holders' Equity	7,672	12,260
Total Liabilities & Equity	14,832	22,760

Part B

By law, a listed company has to publish its annual report and accounts every year. Another legal requirement is the holding of annual general meeting where directors are elected by rotation. In general, the following ten parts are found in this very informative document:

- balance sheet
- earnings statement
- statement of cash flow
- statement of changes in equity
- schedules
- statement of accounting policies
- chairman's statement
- directors' report
- auditor's report, &
- proxy form

You may find 5 or ten year financial highlights besides. The first five elements comprise **financial statements**. Schedules are simply breakdowns of lumped-up figures in the financial statements. The chairman's statement does not normally get much attention as it is short and lacks informative value. The directors' report (called 'management discussion & analysis' in the U.S. & Canada) contains much better information about historical performance, present position, current trends and future potential of the company. The auditor's report follows a standard format all over the world and 'attests' the fact that the accounts have been drawn up according to applicable rules, conventions and principles and that users may place reliance on them. It may so happen that an auditor may add a 'qualification' in his/her report. When that happens, the relevance and value of the financial statements is greatly diluted. An adverse opinion, which is rare, is tantamount to a 'death sentence'. A proxy form allows a shareholder to have another shareholder vote for her when a motion is tabled at the 'annual general meeting'.

Listed below are stakeholders that are most interested in reviewing financial statements:

1. Shareholders
2. Tax authorities
3. Creditors & suppliers
4. Business partners
5. Lenders
6. Financial analysts &
7. Treasurer & controller

Stakeholders listed from 1 to 5 are outsiders 'looking in'. Their perspective differs from the insiders (Serial 7). There is information 'asymmetry' between these two groups as insiders have more information than outsiders. This advantage allows the management team to carry out in-depth analysis (both historical & forward looking). Shareholders are interested in such measures as return on equity, dividends per share, and current yield. Tax authorities are interested in arriving at taxable income and any whiff of tax avoidance. Short term creditors and suppliers are primarily interested in liquidity. Lenders look at solvency. Financial analysts look at a range of measures, paying particular attention to valuation ratios (see below).

The quality of analysis is critically dependent on the quality of accounting data furnished by the company. Also, 'quality of earnings' is a test that astute observers look for. This test is met when income is recognized only when its realization is certain; whereas, expenses and liabilities are recognized when probable. A stricter test for earnings recognition ensures that profits are not over-stated. In any case, the statement of cash flows will clearly reveal whether the company is resorting to accounting tricks to fool investors.

Now let us go back to our previous day's class and elaborate on certain ratios. In real life, the earnings or profit & loss statement follows a 'cascading' pattern. For example, information may be presented in the following sequence: gross profit (margin), operating profit, profit before tax and lastly, profit after tax. Operating profit is very useful being earnings from continuing operations of the company, not counting interest, foreign exchange income or capital gains that cannot be relied upon to produce consistent earnings year after year.

What is the usefulness of the ratio EBIAT/Capitalisation? In finance, academics sometimes do not distinguish between loan and equity capital. The interest expense is added back to earnings. Had interest expense been paid from after tax earnings (as is the case with dividends), this would not have been necessary. Thus EBIAT shows after-tax income attributable to capital employed (loan + equity).

A revealing ratio which was not mentioned in the previous class is net profit after tax (**NPAT**)/**Total Assets**. This can be further broken up in to: NPAT/Sales x Sales/Total Assets. Sales cancel out, leaving NPAT to Total Assets. This means that NPAT/Total Assets ratio depends on the interplay between net margin and total asset turnover. Please note that the word 'turnover' has two meanings: (a) the rate at which an asset circulates and, (b) annual sales.

Listed below are some of the common valuation ratios:

- Earnings per share (EPS),
- Price earnings ratio (PE),
- Price to book value (PBV),
- Enterprise value to EBITDA, &
- Total assets to common equity (Equity Multiplier)

This course, being introductory, is not the platform to discuss the above ratios.