CGMA TOOLS

How to analyse profitability: DuPont® system, EBITDA and earnings quality
Two of the world's most prestigious accounting bodies, AICPA and CIMA, have formed a joint venture to establish the Chartered Global Management Accountant (CGMA) designation to elevate the profession of management accounting. The designation recognises the most talented and committed management accountants with the discipline and skill to drive strong business performance.
INTRODUCTION

The DuPont® system enables one to examine a firm’s financial statements to determine what, if anything, is causing its Return on Investment or Return on Equity (ROE) to fall short of expectations. This is accomplished by breaking these returns into three component parts: Profit margin, asset turnover, and return on assets. Only when one of these three is identified as an area of weakness can management take appropriate steps towards improvement.
We can split the numerator from the denominator. Simple algebra allows this as long as we replace the question marks in both places with the same number:

We will replace the question marks with “total assets.” By doing so, we now have two ratios. The first is the return on assets (ROA) and the second is the equity multiplier. By multiplying the ROA times the equity multiplier we would obtain the original ROE that we could have obtained directly. So, why would we compute the ROE the long way instead of the direct way? The answer is that we obtain more information if we look at the two component ratios. We can then determine why the ROE is not large enough or conversely why it is large:

The ROA shows the rate of profitability from the investment in assets. Suppose two companies in the same industry have the same dollar amount of profit for the financial year. We would argue that the company with fewer assets had performed better because the income was produced with fewer assets. We will shortly dissect the ROA even further.

The other ratio is the equity multiplier and it shows how debt usage can “lever up” the ROE. The more debt a company has, the larger its equity multiplier will be. The equity multiplier is perfectly redundant with the debt to asset ratio. That is, they measure the same thing but use a different scale of measurement. The equity multiplier is “1” for an all-equity firm. As leverage increases, the equity multiplier increases. For example, a company with a debt to asset ratio of 50% would have an equity multiplier of 2. When debt usage increases and a larger equity multiplier occurs, this can increase the ROE.

If a firm’s ROA is 10%, an increase in debt usage as a percentage of total assets that causes the equity multiplier to rise from 2 to 3 will cause the ROE to rise from 20% to 30%. The reverse is also true. When a company is losing money, the equity multiplier “levers down” the ROE.

By breaking down the ROE into these two ratios, we can see how much of the reported ROE is due to the profitability of assets and how much to leverage.
As before, we can split the numerator from the denominator:

\[
\text{ROA} = \frac{\text{Profit for the Financial Year}}{\text{Total Assets}}
\]

We then replace the question mark with “Sales.” This produces two ratios: the profit margin and the asset turnover. The asset turnover is sometimes called the asset utilisation ratio:

\[
\text{ROA} = \frac{\text{Profit for the Financial Year}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}
\]

For a company to make a profit, it must do two things. First, it must bring in revenue by selling its product or services. Second, it must control costs so that they are less than revenue. By breaking down the ROA we can address these two issues.

The profit margin shows the number of pennies of profit from each dollar of revenue. When sales are stable or increasing, the profit margin determines the company’s ability to control costs. So a declining profit margin generally signals a cost control problem. Of course, one could conceivably increase a profit margin by increasing prices. However, price increases may be unrealistic in a competitive environment. A low or declining profit margin when sales are stable or increasing signals the need to control costs.

The asset turnover ratio shows how well the company is using its asset base to produce sales. A low asset turnover implies insufficient sales or excessive assets, while a large turnover suggests that assets are being sufficiently used to produce sales. When the asset turnover is too small or is declining, the company should focus on producing sales.

Note that this system does not answer all of our questions about profitability. By identifying whether the problem is sales- or cost-related, it does allow us to ask the correct questions.

From this breakdown, we can see that a low ROA (or ROE) can be caused by inadequate cost control or inadequate sales. We can observe this in the following example in Table 1:

<table>
<thead>
<tr>
<th></th>
<th>Profit Margin</th>
<th>Asset Turnover</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>6%</td>
<td>2</td>
<td>12%</td>
</tr>
<tr>
<td>Company B</td>
<td>2%</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td>Industry Average</td>
<td>4%</td>
<td>4</td>
<td>16%</td>
</tr>
</tbody>
</table>

Both Company A and B have positive profits, but both have below average ROAs. To improve their profitability, we would recommend two different strategies. Company A is already above average at cost control. There would be little room for improvement here. However, Company A is below average in producing sales. It should increase its marketing efforts.

Company B also has a below average ROA. Its problems are not sales-related as it has an above average asset turnover. Company B has considerable room for improvement in cost control. Alternately, if the industry is not too competitive, it could improve the profit margin with a price increase.
TOTAL DUPONT® SYSTEM

We can see the entire system below. The product of the profit margin, asset turnover and equity multiplier is the ROE. We can now see that the ROE depends on cost control, the ability of the assets to produce sales and leverage:

\[
\text{ROE} = \frac{\text{Profit Margin}}{\text{Sales (Cost Control)}} \times \frac{\text{Asset Turnover}}{\text{Assets (Asset Turnover)}} \times \frac{\text{Equity Multiplier}}{\text{Equity (Leverage)}}
\]

The following table highlights the use of the DuPont® System:

TABLE 2

<table>
<thead>
<tr>
<th>Companies</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit Margin</td>
<td>4.5%</td>
<td>6.0%</td>
<td>3.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Asset Turnover</td>
<td>1.8</td>
<td>1.5</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>8.0%</td>
<td>9.0%</td>
<td>9.0%</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

What does this tell us about the profitability of the three companies? Company A is below average in both cost control and ability to generate sales. Clearly, Company B is controlling its costs better than the others. However, Company B has a low asset turnover. Its focus should be on producing sales. Company C has a large asset turnover but a low profit margin. Its focus should be on cost control.

Continuing the analysis with return on assets and the equity multiplier, we find the following:

TABLE 3

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Assets</td>
<td>8%</td>
<td>9%</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>Equity Multiplier</td>
<td>4</td>
<td>2</td>
<td>1.33</td>
<td>2</td>
</tr>
<tr>
<td>Return on Equity</td>
<td>32%</td>
<td>18%</td>
<td>12%</td>
<td>20%</td>
</tr>
</tbody>
</table>

What has happened to the relative rankings? Company A has moved to the top because of its use of debt. Company C is run very conservatively, so it is penalised. Which company is best? From the use of debt point of view, there is no one answer — it is a risk/return trade-off. What would happen to Company C's ROE if C used an average amount of debt? It would rise to 18%.
EBITDA ANALYSIS

EBITDA refers to “earnings before deduction of interest expense, income taxes, depreciation and amortisation.” This number is often used in ratio analyses prepared by stock analysts. By using this number the analyst attempts to reduce the effect of outside influences (such as interest expense), the impact of timing (depreciation), and the impact of authorities on profit.

For these ratios we also use operating assets. Operating assets are total assets less investments and other assets; and they therefore, include most current assets and property plant and equipment:

\[
\text{Operating ROA} = \frac{\text{EBITDA}}{\text{Operating Assets}}
\]

This ratio provides a measure of profitability that focuses on operations without the outside influences discussed above.

As in the DuPont® System, we can identify the two components that make up the operating ROA. They are:

\[
\frac{\text{EBITDA}}{\text{Operating Assets}} = \frac{\text{EBITDA}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Operating Assets}}
\]

\[
\text{Operating Assets ROA} = \text{Operating Margin} \times \text{Operating Asset Turnover}
\]

Operating margin measures the efficiency of operations in producing operating profits. That is, it measures the number of pennies of EBITDA per dollar of sales.

Operating asset turnover measures management efficiency in utilising operating assets to generate revenues.
The quality of a company’s earnings depends upon two things. The first is the company’s perceived ability to continue earning profits at current levels or better. When we believe that it can continue at this rate, then we argue that earnings quality is good. If we doubt that it can continue earning at this rate, then we argue that earnings quality is poor. The key word here is “perception” because the measurement of earnings quality is judgemental and the analyst must rely on several things to form an opinion. The second aspect of earnings quality is the relation of earnings to cash flow. While earnings and cash flow are not the same thing, if they have no relation with each other then we argue that earnings quality is poor.

Continuation of Earnings

Continuation of earnings can be measured by examining five things. These include:

- Strength of the balance sheet
- Presence of one-time transactions
- Age of the assets
- Adequacy of research and development
- Incentive plans for key managers

If a company has a weak balance sheet, it may not be able to maintain earnings. Recall that a weak balance sheet would mean a company has excessive debt and/or inadequate liquidity. In either case, the company’s earnings will suffer more when there is an inevitable downturn in the business cycle. Excessive debt will lever-down earnings when economic times become tough. A weak balance sheet makes it less likely that a company can survive a severe external shock and it is, therefore, less likely to continue earning at the current rate.

Second, a company that has increased its earnings through one-time transactions will not be able to maintain its earnings. For example, suppose a company has a gain because it sold fixed assets at a profit, or because it sold its investment in financial securities. These transactions cannot be repeated year after year. The presence of one-time transactions reduces the quality of earnings. You might consider removing the effect of one-time transactions from profit and profitability ratios when you examine the company.

Third, you should examine the age of the company’s assets. If a company does not replace its assets, in the future it will be faced with the potential of a considerable investment. Thus, with aging assets it will not be able to maintain its profits over the long run. To estimate the age of assets you can divide the accumulated depreciation by the year’s depreciation expense.

\[
\frac{\text{Accumulated Depreciation}}{\text{Depreciation Expense}} = \text{Estimated Age of Assets}
\]

Fourth, you should examine a company’s research and development expenditures across time and relative to its industry. If a company stops research and development, even temporarily, future profits could suffer. This is especially true in industries with rapid technological changes, such as the computer or electronics industries. However, it may be relatively less important in other industries. To examine this concept, you should compute the research and development expenses relative to sales across time and, if available, to an industry average:

\[
\frac{\text{R&D Expense}}{\text{Sales}} = \text{Relative R&D Expenses}
\]
Finally, you should examine incentive systems within the company for key managers. If pay is closely tied to corporate earnings, there are incentives created to inflate current corporate earnings.

**Relationship of Earnings to Cash Flow**

There are four things to examine when determining the relationship of earnings to cash flow. The first is fraud. Fraud can take many forms, and unless a company has discovered the fraud, the effect of it on earnings quality cannot be determined.

Second, you should look at the company’s accounting policies in relationship with the industry, and determine the effect of any recent accounting changes. There is considerable latitude given companies in the selection of accounting principles. The selection of one type of procedure versus others can affect earnings. It may be difficult to determine the exact effect of one procedure versus the others, but you can look for several of the following:

- Look at the accounting policies of the company in relationship to those of two or three other companies in the same industry. Are they the same, different?

- Has the company recently changed (reduced) the amount of expenses that they allocate for bad debts, warranties, or other reserve and contingency accounts? If so, this may overstate earnings.

- Has the company changed auditors recently? If so, it may be the result of a disagreement over accounting principles. However, some companies change auditors for more legitimate reasons, so a change does not always indicate an earnings quality problem.

- Do the footnotes indicate a recent change in accounting practices? If so, does the company show the effect on earnings?

- If deferred taxes are increasing rapidly, more rapidly than in previous years, this indicates a big difference between financial reporting income and tax income. This may mean that the company has used aggressive accounting practices for financial reporting but conservative practices for taxes.

- Does the auditor’s report contain any qualifications? If so, the auditor may have a disagreement with management over the presentation of the financial results. You would need to estimate the effect of this disagreement on earnings.

Third, you need to look into the possibility that a company accelerated sales at year’s end. If a company has run a promotion at year-end with excessive discounts or with too-liberal credit terms, the sales for the current year may be overstated. This would tend to boost the current year’s earnings at the expense of the future, and would make the earnings less related to cash flow. One thing to watch for would be dramatic increases in accounts receivable. While this often occurs because of other problems or policies, it may occur when a company has attempted to accelerate its sales.

Finally, you should compare the various earnings ratios with those that use cash flow instead of earnings. The cash return on equity is a good example. You compute this ratio by dividing net cash from operations by stockholders’ equity:

\[
\text{Cash Return on Equity} = \frac{\text{Net Cash Provided by Operations}}{\text{Stockholders’ Equity}}
\]

The interpretation of this ratio is the same as for the ROE, but you are examining cash flow instead of income. Similarly, you can compute a cash return on assets or a cash margin. Thus, a complete DuPont analysis is possible with cash instead of income.

Why would you want to examine cash flow in addition to income? It is cash flow that keeps a company afloat. A company pays its creditors and employees in cash. Shareholders that expect dividends are generally paid in cash. Cash is the basis for most transactions and is necessary for a business to survive. It is possible for a company to have positive income, but negative cash flow from operations. So, monitoring cash along with income is appropriate.
The Association of International Certified Professional Accountants, a joint venture of AICPA and CIMA, established the CGMA designation to elevate the profession of management accounting globally.