USING ROE TO ANALYZE STOCKS: WHAT YOU NEED TO KNOW ABOUT

By Ellis Traub

For evaluating management's skill at making use of a company's equity, ROE is the preferred metric. However, for any point of reference to be of value, it must always mean precisely the same thing to everyone who uses it. Yet little effort has been made to precisely define the components of ROE, which can result in misinterpretations, and has decreased its usefulness in analysis.

One of the most notable inventions of the 1400s was that of the brilliant Italian mathematician, Luca Pacioli. For nearly six centuries, his contribution to the world—double-entry bookkeeping—has served mankind well.

But the information age has brought with it some new thoughts and concepts about how to understand a company. Such issues as "intellectual assets" and "amortization of good will" have provoked lots of discussion in the merger and acquisition arena, for example, and there are changes being recommended by some of accounting's heaviest hitters (see the Stock Fundamentals article on page 15 in this issue).

While we're challenging these concepts, might it not be well to review some of the other basics that we take for granted and consider their utility?

Without our realizing it, over the past six centuries, some concepts have mutated or evolved to the point where their original logic has been distorted or forgotten.

Excluding debt, management has two resources with which to produce a profit—the revenues that the company generates during the year, primarily through the sale of whatever products or services the company offers, and the equity of the company, mainly fed by the profits retained from one year to the next.

Ideally, the former is used to cover a company's expenses; the latter involves the longer-term assets with which revenue is generated or expense reduced. To be sure, it's not likely for an investor to be very much interested in a company that invades its equity to cover its operating expenses—at least for very long.

The most common means of evaluating a management's skill at making use of revenues are profit margins—the percentage of revenue that exceeds expense. And the analyst can choose from a whole spectrum of lines on the income statement to divide by the revenue. These range from the gross profit to the net income available to common shares—each with a somewhat different but useful and interesting story to tell. And the margin is logically identified and defined by the line from which it's derived: "gross profit margin," "operating profit margin," "pre-tax profit margin," etc.

For evaluating management's skill at making use of equity, return on equity (ROE) is the preferred metric. It was probably not long after Pacioli came up with the first financials that he—or someone—decided to measure the return that a business owner or owners obtained from their investment in the business. And it made perfect sense to simply divide the profit by the equity the owner or owners had in the business to arrive at it.

However, for any parameter or point of reference to be of value, it must always mean precisely the same thing to everyone who uses it. To refer to terms, mathematical concepts, ratios, etc., that are not defined identically by all that use them is to fail the test of utility.

Over time, in an effort to dissect financial statements and fine-tune financial analysis, attempts have been made to tinker with the basic components of ROE. This would have been okay, except for one thing: Little effort has been made to label the definitions, as was done to tie down profit margins. And

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this has contributed to misunderstandings and misinterpretations about ROE, thus decreasing its usefulness in analysis.

WHAT CAN ROE TELL YOU?

There are three ways that this ratio is typically used in evaluating a company's profitability and quality:

- It can be analyzed as an absolute number;
- It can be compared with other companies;
- Its trend can be analyzed.

Three additional components of ROE can be illuminating when properly taken in context: profit margins, asset turnover, and balance sheet leverage—the product of which comprises the ROE. We'll discuss these briefly later on. First, let's deal with the number itself.

AS AN ABSOLUTE NUMBER

Most financial analysis books define ROE simply as "a company's profitability, measured by its income divided by its equity," or some such general definition. The accounting textbooks I've searched seem to be hardly less general in their definition, although more specific in describing the calculation. But it's in this calculation that questions begin to arise, requiring answers that go beyond the trivial.

For instance, what income figure should be used? Return on equity has the same selection of income lines to draw from as profit margins. Then there's also earnings per share (EPS), which shows the allocation of that income to the shareholders. This data can include or exclude discontinued operations, extraordinary (unusual and infrequent) items, and/or non-recurring (unusual or infrequent) items. The most common calculation of return on equity divides the net (after-tax) income by the equity.

But that leads to another question: What equity figure should be used?

Here there are three options—all of which are commonly used:

- Beginning equity: The equity shown at the end of the previous period.
- Ending equity: The equity shown at the end of the period during which the income is earned (many financial analysis books leave the definition of equity unqualified; but their examples show ending equity).
- Average equity: The average of beginning and ending equity (which is what is typically taught in the accounting departments of the colleges and universities across the nation and is found in their textbooks).

Book value (per share) is commonly used in conjunction with the earnings per share. This is complicated by the fact that the earnings per share figure is calculated using the average shares outstanding during the period, while the book value per share uses the shares at the end of the period.

Most of the above forms of income and equity are used in ROE calculations, although some are in wider use than others. But the use of each will have a very clear bearing on the validity of what you can learn from the statistic, so it is important to know the exact components when you are examining ROE figures, particularly given the emphasis that is placed on ROE as being "the primary test of managerial skill."

An example will illustrate the importance of understanding the components of ROE. Table 1 provides financial information on American Widgets, Inc. (AWI), a fictional company.

Depending upon your method of calculating return on equity, from this data, you could come up with a range of ROEs that vary anywhere from 16% to 26%.

The most common calculation, net income divided by average equity, would produce an ROE of 18.4%. Changing the numerator, net income, to income available to shareholders, would produce a ROE of 24.0%. Changing the original equation's denominators produces two more variations: dividing net income by beginning equity would yield a ROE of 20.0%, while dividing by ending equity would produce a ROE of 17.1%.

Which ROE is the most useful for investors?

ROE is most often used to determine such things as implied or sustainable growth rates. However,

TABLE 1. CHANGING ROES: AN EXAMPLE

Financial Statistics for American Widgets, Inc. (AWI)	
Equity, beginning ($, millions):	100.0
Shares outstanding, beginning (mil):	10.0
Net income after taxes ($, millions):	20.0
Extraordinary items ($, millions):	6.0
Income available to shareholders ($, millions):	26.0
Earnings per share ($):	2.57
Dividend payout (%):	35
Equity, ending ($, millions):	116.9
Shares outstanding, ending (mil):	10.2

Different ROEs Based on Different Components

Net income ÷ average equity:
20.0 ÷ 108.45 = 18.4%

Income available to shareholders ÷ average equity:
26.0 ÷ 108.45 = 24.0%

Net income ÷ beginning equity:
20.0 ÷ 100.0 = 20.0%

Net income ÷ ending equity:
20.00 ÷ 116.9 = 17.1%

TABLE 2. THE COMPONENTS OF ROE

$$ROE = \text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Balance Sheet Leverage}$$

$$= \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$$

if ROE is not the return on *beginning equity*, then these kinds of growth rates cannot be wedded to ROE.

Moreover, unless beginning equity is consistently used, the relationship between ROE and earnings growth is distorted. Here's why: When ROE is calculated using an equity figure that is other than beginning equity, a company can do a number of other things that can then reduce the equity figure, thus making it appear that ROE has been sustained over the previous period or even increased.

Any transaction that affects an equity account but that doesn't flow from the income statement can have this result. For example, paying dividends depletes the cash asset, reducing equity; repurchasing shares does the same. Either of these transactions will increase the ROE (unless beginning equity is used in the equation) because equity is decreased while income is unaffected.

Conversely, issuing shares increases the cash and the equity account, while adjusting the value of investments to reflect unrealized gains at the end of the period (which insurance companies must do while other companies may not) would tend to distort the value of equity in the other direction, reducing ROE unless beginning equity is used in the calculation.

For these reasons, Warren Buffett, one of the most famous proponents of ROE in investment analysis, chooses to use beginning equity to calculate ROE.

In a nutshell, permitting the denominator in the ROE equation to be modified by anything that transpires during the course of the period for which the income is recorded will distort the result, and the faster the growth of the company's earnings, the more distortion will occur because of the magnitude of the retained earnings that contribute to the equity growth. At a minimum, if you are analyzing a company and using ROE figures that use equity figures other than beginning equity in the calculation, you should make sure that you are aware of these possible distortions.

Incidentally, balance sheet transactions such as paying off or adding debt, acquiring or selling assets for cash or credit, etc., do not affect equity because of the offsetting entry to another asset or a liability account. Even the gain on an asset sold at a profit shows up in the equity account as a result of its trip through the income statement.

Of course, where debt is added or reduced, there may be a future impact on equity as interest expense is added or reduced, or the benefits of acquiring other assets are realized—but not until some time in the future. And these results show up in the profit margins.

If you use beginning equity in your ROE calculation, as Buffett does, a company needs to grow its earnings at a rate equal to that of the return on equity in order to sustain its ROE, and no other transactions will affect that result. Thus, using beginning equity in your calculation, ROE can be a useful measure in and of itself, grading management's skill by the size of the return, its relationship to the company's growth, and the feasibility of the company's ability to sustain that return.

AS A COMPARATIVE MEASURE

If you are using ROE as a comparative measure among companies, it is also important to use beginning equity in the calculations. The same transactions that affect the equity accounts will work to distort such comparisons unless beginning equity is used. A company that pays dividends when compared with one that doesn't, for example, will—all other things being equal—produce a ROE that is superior to the company that doesn't if the denominator is average or ending equity. The same is true of a company that has bought back its shares. But, a growth investor wouldn't want to award the higher marks to the company that wouldn't reinvest its money in its own operation. And the repurchase of shares may or may not be a good decision depending upon the price paid for them.

The point is that an effective comparison requires that apples be compared with apples. Using ending or average equity makes pears or apricots out of apples—it's impossible to compare a company that pays dividends or adjusts the value of equity during the period with another that doesn't.

EVALUATING TRENDS

Trends in ROE are enlightening when they're the result of unadulterated earnings growth or decline. But, once again, if beginning equity is not used in the calculation, those other variables can influence the trend enough to override the direction it would have taken as a result of the income growth.

ROE COMPONENTS

The three components of return on equity are useful analytical tools (See Table 2). They are:

- The net profit margin—usually the net income after taxes divided by sales;
- The asset turnover—sales divided by the company's assets; and
- The balance sheet leverage—those assets divided by the company's equity.

The product of these components—net profit margin times asset turnover times balance sheet lever-

age—equals ROE.

The value of these components is only as good as the outside parts that make up ROE. By "outside parts," I mean the income and the equity that make up the ROE, and which define the margin and the leverage respectfully. Because the ROE is the product of each of these components, changes in sales will affect the margin and have the reverse effect on the turnover; changes in assets will likewise inversely affect both the turnover and leverage.

Dissecting ROE like this helps to reinforce the logic of using beginning equity because the profit margin is the sole component that comes from the income statement. Asset turnover makes sense when you analyze just how much revenue a company can produce from each dollar's worth of assets it started with, and it is more informative to contemplate leverage when the assets by which the equity is divided do not include those accumulated during the period. If you're going to evaluate what percentage of your assets are covered by debt—the amount of leverage that exceeds 100%—then it would only cloud the issue to incorporate the current assets in that figure. There are different metrics that do a better job of evaluating credit management.

SUMMING IT UP

If you want to use fundamental analysis effectively, you must have a clear understanding of your tools. Currently, this can be hard to do when you are looking at ROE figures because of the inconsistencies in the measurement of ROE.

However, if it's important to express profit margins as "gross margins," "operating margins," or "pre-tax margins," then it's equally essential to identify ROE as "net return on beginning equity," "EACS return on average equity," or the like. At least, in that scenario, anyone using those ratios will be able to assess their shortcomings and make rational analyses and comparisons.

At a minimum, if you are analyzing a company, you need to understand how the ROE figures were generated, and be aware of distortions that can occur depending on the equity figure used.

If you are calculating ROE on your own, it should be calculated using the most "stripped-down" income available; i.e., "normalized income after taxes," which excludes all non-recurring and extraordinary items from the income derived from continuing operations. This is not all that easy to come by. Either you, or your data provider's analysts must estimate the tax implications for the non-recurring items excluded, since such items appear above the tax line on the income statement.

At this time, the only data providers I know of that offer normalized earnings are Value Line (www.valueline.com) and Market Guide (www.marketguide.com).

As a practical matter, the second best and probably the "most likely to succeed" would be income available to common shares from continuing operations excluding extraordinary items. And the net income after taxes would be a near next choice.

The income source, so long as it's identified, is not the crucial issue however. Far more important is that, whatever income is used, it should be divided by beginning equity in order to exclude any distortions that arise from changes to equity—especially those from the retained earnings. The concept of return must be simple. Whatever incremental increases in income may result from the use of that income should be regarded merely as effective utilization of the beginning equity that produces the return.

At the very least, for those that use average or ending equity, if it's worth the trouble to consider return on equity at all, then it's worth the trouble to back out the items that affect changes in equity during the period, if not the retained earnings. The use of average equity is not good, but beats ending equity.

Probably the least useful calculation of ROE uses earnings per share divided by ending book value, because that figure is not only distorted by all of the issues raised above, but it's also subject to the additional inaccuracies that come from using different values for outstanding shares—e.g., diluted, average, weighted average, shares at the beginning or end of the period—to arrive at the top and bottom of the equation.

To be useful, ROE must be calculated using components that clarify, rather than distort, the return picture. Or, at the very least, as an analyst you must be aware of those possible distortions by being aware of the components used in the calculation. Without this awareness, I would suggest that ROE is simply not what it's cracked up to be. ❖

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Investing Pathways: Found on the right-hand side of our home page. Take a tour of the stats found in financial statements by clicking on Financial Statement Analysis under Stocks.

Search: Found on the upper left-hand side of the home page. Type "return on equity" in the Simple Keyword Search box to go to the following recent articles:

- "Picking Stocks the Buffett Way: Understanding Return on Equity"
- "ROEs at a Resonable Price: A Top-Down Bottom-Up Approach"

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