

## A Winning Formula

When meeting with clients and potential clients, we are sometimes asked to boil down investment success to just *one* factor. Of course, that's an impossible question to answer. If investing were so easy, we would see more mutual funds beating the market over the long term, as opposed to the current reality, where a big majority of mutual funds underperform the S&P 500. Selecting superior investments involves a number of factors, both quantitative (e.g., margins, inventory turns, debt ratios, valuation metrics) and qualitative (e.g., Is management trust-worthy? How is the competitive landscape? Does the business have a sustainable competitive advantage?).

If a gun was pointed to our heads, however, and we *had* to come up with just one factor, we would have to say just three letters: ROE.

### What is ROE?

ROE, or return on equity, is a yardstick of financial performance that measures the amount of earnings per dollar of equity capital. It is a measure of “bang per buck.” So, in simple terms, the higher the company's ROE, the better. Mathematically, ROE is expressed in a very simple formula:

$$\text{Return on equity (ROE)} = \text{net income} / \text{shareholder's equity}$$

This is great, you must be saying. I just take the net income figure from the income statement and the shareholder's equity figure from the balance sheet, get my handy calculator, divide one number by the other, and I have the company's ROE. Then, all I have to do is buy the stocks of the companies with the highest ROEs and then smile my way to the bank. Retirement, here I come.

Well, not so fast.

### Decomposing the DuPont way

In the 1920s, American chemical company DuPont ([NYSE: DD](#)) decomposed the ROE calculation into its more basic components to dig further into what drives ROE. With the DuPont equation, we can define ROE as:

$$\text{ROE} = (\text{net income} / \text{sales}) * (\text{sales} / \text{assets}) * (\text{assets} / \text{equity})$$

As you can see, the denominator of the first ratio cancels with the numerator of the second ratio, and the denominator of the second ratio cancels with the numerator of the third ratio, yielding the simplified formula that we started with.



The first ratio, “net income / sales” measures a company’s profit margin; “sales / assets” measures asset turnover; and “assets / equity” measures the equity multiplier. ROE can then be expressed as:

$$\text{ROE} = \text{profit margin} * \text{asset turnover} * \text{equity multiplier}$$

The profit margin is a measure of profitability that tells us the amount of earnings that can be squeezed out of each dollar of sales. It reflects the pricing strategy of a company and its ability to control costs.

While some people believe that the more assets the company has, the better it is, the reality is just the opposite. Ideally, a company would produce profits without any assets. That would mean that investment was not required, and returns on investment would be infinite. Asset turnover is a measure of operating efficiency that calculates the amount of sales generated from each dollar of assets employed.

The equity multiplier is a measure of financial leverage that indicates the amount of equity used to finance the assets. Financial leverage is increased when the proportion of debt relative to equity is increased. While financial leverage increases ROE, companies do not necessarily want to maximize leverage, since higher debt increases the risk of the company.

DuPont recognized that these three ratios are the three levers for controlling ROE and, thus, different ways to investing nirvana. Simply put, the higher the profit margin and/or the asset turnover and/or the equity multiplier, the higher the ROE.

Enough with the math, we can hear you saying. How is this helpful? To answer that, let’s look at some specific numbers of some actual companies.

### Digging in

It is interesting to compare two companies that generate the same amount of returns on equity, but get there in different ways. Let’s take a look at two different companies: software giant Microsoft ([NASDAQ: MSFT](#)) and food distributor Sysco Corp. ([NYSE: SYU](#)).

	[a]	[b]	[c]	[d]	[e]	[f]	[g]	
					[a] / [b]	[b] / [c]	[c] / [d]	[e] * [f] * [g]
	Net Income	Sales	Assets	Sh. Equity	Profit Margin	Asset Turnover	Equity Mult.	ROE
MSFT	16,978,000	73,723,000	121,271,000	66,363,000	23.0%	0.61	1.83	25.6%
SYU	1,121,585	42,830,939	12,094,972	4,685,040	2.6%	3.54	2.58	23.9%

(in thousands). Source: Yahoo! Finance



As can be seen from the table above, both companies generate similar returns on equity, between 24% and 26%. Microsoft achieves those high returns based on its very high profit margins. Sysco, on the other hand, has extremely low profit margins. Those low profit margins, however, are compensated by very high asset turnover.

Profit margin and asset turnover tend to vary inversely, with companies with low profit margins tending to have high asset turns, and vice versa. The beauty of the DuPont analysis is that it shows us that a high profit margin is not necessarily better or worse than a low one; it all depends on the combined effect of the profit margin and the asset turnover.

Another interesting thing to analyze is to compare two companies in the same industry and see how one performs against the other. The DuPont analysis will give good clues as to which company is performing better. Let's examine two fierce competitors in the retail space: Wal-Mart ([NYSE: WMT](#)) and Target ([NYSE: TGT](#)).

	[a]	[b]	[c]	[d]	[e]	[f]	[g]	
					[a] / [b]	[b] / [c]	[c] / [d]	[e] * [f] * [g]
	<b>Net Income</b>	<b>Sales</b>	<b>Assets</b>	<b>Sh. Equity</b>	<b>Profit Margin</b>	<b>Asset Turnover</b>	<b>Equity Mult.</b>	<b>ROE</b>
WMT	15,699,000	446,950,000	193,406,000	71,315,000	3.5%	2.31	2.71	22.0%
TGT	2,929,000	69,865,000	46,630,000	15,821,000	4.2%	1.50	2.95	18.5%

*(in thousands). Source: Yahoo! Finance*

While Target has slightly higher profit margins and leverage, Wal-Mart comes out on top when looking at ROE. Wal-Mart achieves a higher ROE due to its higher asset turnover. That means that Wal-Mart is more efficient than Target at using its assets to generate sales. So while Target has a higher profit margin, what really matters is the combination of profit margin with asset turnover.

Another useful way of using ROE and the DuPont equation involves using trend analysis and noting how ROE and its three components change over time. One can start with the ROE numbers and observe any changes. Then, using the DuPont equation, one can gain a better perspective about the cause of the change in ROE by looking at the trend in profit margins, asset turnover, and financial leverage.

Below is some 10-year data for candy maker Tootsie Roll Industries ([NYSE: TR](#)).



	[a]	[b]	[c]	[d]	[e]	[f]	[g]	
TR					[a] / [b]	[b] / [c]	[c] / [d]	[e] * [f] * [g]
	Net Income	Sales	Assets	Sh. Equity	Profit Margin	Asset Turnover	Equity Mult.	ROE
2003	65,014	392,656	665,297	536,581	16.6%	0.59	1.24	12.1%
2004	64,174	420,110	811,753	570,179	15.3%	0.52	1.42	11.3%
2005	77,227	487,739	813,696	617,405	15.8%	0.60	1.32	12.5%
2006	65,919	495,990	791,639	630,681	13.3%	0.63	1.26	10.5%
2007	51,625	492,742	812,725	638,230	10.5%	0.61	1.27	8.1%
2008	38,880	492,051	813,252	636,847	7.9%	0.61	1.28	6.1%
2009	53,157	495,592	836,844	654,244	10.7%	0.59	1.28	8.1%
2010	53,063	517,149	857,959	667,408	10.3%	0.60	1.29	8.0%
2011	43,938	528,369	857,856	665,935	8.3%	0.62	1.29	6.6%
2012	52,004	545,985	846,737	649,815	9.5%	0.64	1.30	8.0%

(in thousands). Source: Tootsie Roll financial reports

A quick glance at the above table shows that it is evident that ROE has deteriorated in the last ten years, dropping from more than 12% to 8%. What explains this drop in ROE? The DuPont equation exposes the elephant in the room: a big decline in profit margins. In 2003, Tootsie Roll's profit margins came in at a very healthy 16.6%, only to steadily decline to 9.5% in 2012. While asset turnover has increased a little bit, it has not been enough to counter the effect of the big drop in profit margins.

What has this meant for the stock? Not great, as you might suspect. As can be seen in the chart below, from the beginning of 2003 to the end of 2012 Tootsie Roll's stock increased 8%, while the S&P 500 had a gain of about 60%.

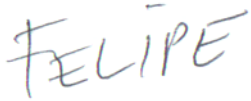


Source: Yahoo! Finance



## Conclusion

Investing is not easy. While it is almost impossible to achieve investment success without looking at a number of quantitative and qualitative factors, it is always helpful to analyze a company's return on equity. The DuPont equation provides an insightful way of looking at ROE by examining the three levers—profit margin, asset turnover, and equity multiplier—in achieving high returns.



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