

## **Topic 4A – Overview of Quality**

Quality is probably the least discussed least well-understood factor among members of the investing public. But in terms of how informative it can be, its way up there. Not only can it help you assess prospects for future return, it may also be the single best indicator of risk that is available.

If you want a quick shorthand definition of quality, think of Return on Assets, which is net income divided by assets. Eliminating the jargon, we could say it's how much money a company earns relative to the money with which it is able to work, or what one earns relative to what one starts with. It should be intuitively obvious that a business that can use \$100 of capital to generate \$10 in profits is better than a business that earns only \$5 using the same \$100 capital pool.

### **The Logical Foundation for Quality as an Investment Factor**

Everything, of course, starts with the logical foundation of stock valuation, our old friend, the Dividend Discount Model (DDM). From that, we came to understand that the ideal price of a stock is equal to the present value of all dividends expected to be received in the future. We also know that DDM is not practically usable in the real world and that one of the proxies we use to point us in the direction of good DDM valuations is earnings (since dividends come from earnings).

Burt there are special characteristics here that make Quality an especially valuable part of our stylistic framework.

Quality, ROA (or ROI or ROE), does not measure earnings or earnings growth per se. It's an indication of a company's potential to generate earnings growth. Since investing is a future-oriented act, measuring potential is, actually, a very important thing. Potential is more persistent over time than the one-off picture of profitability presented by the Income Statement.

### **How Quality Does Its Thing**

Table 1 demonstrates the link between ROA and earnings growth. It traces the earnings path of two companies, both of which pay no dividends. Company A has an ROA of 12%. Company B has an ROA of 16%.

**Table 1 Illustration of Relationship between ROA and Growth**

	Company A			Company B		
ROA	12.0%			16.0%		
Div. Payout	--			--		
	Assets	Earnings	Dividends	Assets	Earnings	Dividends
Start	100.00	--	--	100.00	--	--
End Year 1	112.00	12.00	0.00	116.00	16.00	0.00
End Year 2	125.44	13.44	0.00	134.56	18.56	0.00
End Year 3	140.49	15.05	0.00	156.09	21.53	0.00
End Year 4	157.35	16.86	0.00	181.06	24.97	0.00
3 Year Growth Rate		12.0%	--		16.0%	--

In Year 1, Company A earned 12% on its assets, which amounted to \$12.00. All of that was added to the original capital base, which at the start of Year 2 is \$112. In the second year, it earns 12% of 112, or \$13.44—all of which is added to the base of capital available for next year. We follow this path on from one year to another.

Company B charts a parallel path but one that reflects a 16% ROA (each year it earns 16% on its capital, and all of that is added to the capital base).

All else being equal, Company B must grow more quickly than Company A because it in each year, it earns a higher percent relative to a capital base that expands more quickly through reinvestment of profits.

Table 2 varies the scenario. Now, each company pays out 20% of annual profits as dividends. That reduces the earnings growth rates in both cases because now, each company is expanding its capital base by less than the full amount of profit. Even so, all else being equal, Company B must still outgrow Company A.

**Table 2 Another Illustration of Relationship between ROA and Growth**

	Company A			Company B		
ROA	12.0%			16.0%		
Div. Payout	20.0%			20.0%		
	Assets	Earnings	Dividends	Assets	Earnings	Dividends
Start	100.00	--	--	100.00	--	--
End Year 1	109.60	12.00	2.40	112.80	16.00	3.20
End Year 2	120.12	13.15	2.69	127.24	18.05	3.61
End Year 3	131.65	14.41	2.88	143.52	20.35	4.07
End Year 4	144.29	15.80	3.16	161.89	22.96	4.59
3 Year Growth Rate		9.60%	9.60%		12.78%	12.78%

Each company has a growth rate that is less than its ROA. But that makes sense. Each company is now increasing its asset base each year by less than the full amount that is available. Notice, too, that for each company, all else being equal, dividends grow by an amount that matches the earnings growth rate and hence is higher for Company B (16% ROA) than Company A (12% ROA).

So what about the ubiquitous “all else” that must be equal in order for all this to make sense. That’s easy, at least easy to say: The ROA must remain steady. Company A, despite a day-one 12% ROA, could be a better choice than Company B if the latter’s ROA is expected to deteriorate from 16%. Could either of those scenarios ever materialize? Yes, absolutely. In the real world, the only constant is change. When strategists using ROA develop their strategies, it’s up to them to figure out how to use the available data to uncover clues relevant to ROA stability, growth or deterioration. The degree of skill they bring to bear in this will contribute the real-world success or lack thereof of their strategies.

### **Is This What is Popularly Referred to as Fundamental Analysis?**

Yes, it is.

Similar to what people in many analytic professions do in many contexts, we assess a whole by decomposing it into its essential parts based on the expectation that the parts are easier to analyze than the whole. Essentially, ROA is a combination of margin and turnover. And if we define the total capital base in terms of Equity (ROE) rather than total assets, then debt leverage also figures into the framework. In subsequent topics, we’ll refer to this decomposition as the “DuPont Framework.” Quality also encompasses the increasingly important field of earnings quality.

### **This Kind of Fundamental Analysis Starts With a Built-In Edge**

All investment-oriented analysis is inherently difficult because we’re limited to using data from the known past to develop reasonable assumptions about the unknowable future.

But however hard that may be – and it really is hard – it’s a lot harder if the data we use tends to be unstable over time. The flip side is that however difficult the task may be, it can become a lot less so if we work with data that tends to be more stable over time, or in quant lingo, tends to be more “persistent.”

As investment-related data goes, ROA (and the variations like ROE that reflect differing definitions of the capital base) tends to be a lot more persistent than many other items. While past performance (of corporations as well as portfolios) can never determine future outcomes, when it comes to ROA, past performance does, at least suggest greater probabilities about future outcomes.

Like other metrics, ROA is not exactly stable. What’s more persistent is ROA trend. (If I remember calculus correctly, it’s would be more accurate to say the first and second derivatives of ROA, rather than ROA itself, is what’s persistent.) The general expectations are (1) that, on the whole, very high and very low ROAs will revert gradually toward normal levels (often reflecting industry norms) and (2) that high-return companies will tend to remain high-return companies and that low-return companies will remain low-return companies.

These tendencies are illustrated in Table 3, which shows the results of a study on companies sorted by 2005 Return on Assets. We focus on three cohorts:

1. A high cohort of companies whose 2005 ROAs were in the 90th (best) decile,
2. A middle cohort of companies whose 2005 ROAs were in the 45th through 55th percentile,
3. And a low cohort of companies whose 2005 ROAs were in the 10th (worst) decile.

The memberships of each cohort remained constant through 2015 (although there was shrinkage over time due to bankruptcies, mergers, and so forth).

The table shows the median ROA each year for each cohort.

**Table 3 ROA Persistence**

Cohort	Returns on Assets (%)*										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
High	17.32	15.31	13.76	12.43	11.23	7.09	10.60	9.83	9.84	8.99	8.51
Mid	3.43	3.48	3.71	3.08	3.08	1.67	3.15	3.35	3.36	3.07	3.27
Low	-35.92	-13.63	-9.53	-3.97	-3.97	-6.02	-1.65	0.04	0.07	-1.37	-0.92

*\* Median Values. As of January 1<sup>st</sup> of each year*

As expected, we see a tendency for extremes to correct and trend toward more normal levels. Beyond that, the persistence is noteworthy. Consider, for example, 2005's high and low cohorts. While in each case the magnitude of returns became less extreme over time, both cohorts retained their relative positions throughout the entire ten-year span. The middle cohort likewise retained its relative position and exhibited remarkable stability over time, as we might expect given the absence of extremes from which it would have had to revert. Interestingly, even in the off year, 2010, the cohorts retained their relative positions.

### **ROA as a Strategic Tool, Not a Silver Bullet**

Would that life would be so simple as to allow us to simply sort all companies of the basis of ROA (or ROI or ROE), invest in the top few, and be done with it. The problem we have is that world changes, and by more so than the sample medians shown in Table 3 imply. On the whole ROAs trend as shown. But individual situations vary considerably.

So we don't look for high ROAs per se. We look for good ROAs that have the potential to remain good or improve over time. And that's what gets us into the other aspects of fundamental analysis, the DuPont framework mentioned above. High ROA is easy to identify. The hard work is in teasing out ROA stability, improvement or deterioration. Taken together, all this comes under the stylistic label Quality.

## Quality as a Risk Indicator

This would be a good time to introduce the topic of fundamental risk.

Although it's not perceived this way now, the worst evil perpetrated upon the investment community by quants (even the most highly respected of quants) has been to convince so many that we should measure risk in terms of data based on historic stock returns. Their handiwork leads us to exalt the likes of Beta, Standard Deviation, Skewness, Value at Risk, the Sharpe Ratio, the Sortino Ratio, and others.

None of those measures tells us anything about risk. They are merely statistical report cards that tell us what happened in specific past time intervals.

Imagine Stock A with a Beta of 0.75, Stock B with a Beta of 1.65, and Stock C with a Beta of -0.50. There are Nobel Prize winners and Nobel Prize aspirants who will tell you that C is a must own; its negative Beta indicates it moves contrary to the market, thus making it invaluable as a holding that will control risk in a diversified portfolio. A is also pretty good, being 25% less volatile than the market. Meanwhile, B looks a bit dicey being, as Beta shows, 65% more volatility than the market; it's OK if you can tolerate that sort of thing.

It's possible that all of those conclusions may be accurate. But it is equally possible that all of those conclusions may be dangerously wrong. Beta sheds no light one way or the other.

- C may be a frighteningly volatile stock because its earnings are completely unpredictable, and so, too, are shifts in market perceptions about its future; hence volatile earnings and volatile PE (caused by erratic sentiment). You'd think C would have a very high Beta. But what happens if the timing of very bad news that causes the stock to plummet just so happens to be coincident with some good economic news that causes the market to rally? Because the stock moved opposite the market, a beta that might have been 2.50-3.00 winds up at -0.60, not because the company or the stock are less risky but based on the fortuitous of the timing of news.
- B jumped way ahead of the market as it rallied on good news that transforms the firm into something better and more consistent than has ever been the case. Business risk has been sharply reduced. That will reflect in future earnings. And as the market digests this, the PE will stabilize too. In the future, the beta will likely come in at around 0.50. But that's not what we're seeing. The 1.65 Beta is reflecting some upside market volatility as the company's better business profile worked its way into PE and EPS.

- As to A, oh who cares! You've already seen how Betas for B and C, although correctly calculated from a mathematical standpoint can give us messages that are 180-degrees opposite from the messages we should be getting.

How might we evaluate the risk of A based on what we know now? It's OK to equate risk with volatility (so long as we're not so fanatic that we forget upside volatility is a good thing). What we really care about is future volatility, not historic volatility. Predicting future stock prices is a treacherous task. But perhaps we can instead try to get a handle on future company business performance and EPS. We learned that high and stable ROAs will likely translate to better earnings, and although we can't be sure about PEs, investors have done crazier things than assume that good steady earnings will translate to good steady relative PEs.

So why do we waste our time measuring risk using data that has no forward-looking relevance? Why not measure it based on fundamentals that have the logical capability of influencing stock prices in the future?

Actually, that might be the wave of the future. I've already seen a journal article in which mean-variance optimization is done by balancing returns, not against standard deviation of stock prices but standard deviation of ROE. Hopefully, the Smart Alpha Quality rating will become accepted as a risk measure, which is exactly what I've encouraged in the subscribers' seminar.

The cynic in me worries that this evolution may be a long time in coming. It will require quants to boost their skill sets (being Einstein, Sharpe, Black, Sholes, Merton, etc. won't be good enough; they'll also have to become Graham, Dodd, Buffett, etc.) and the data sets with which they work (which for those not on Portfolio123, can get expensive).

Actually, though, slow adoption could be a big plus for us. How nice would it be for live performance if you are tuning in stocks the market thinks are highly speculative but which you know aren't! And how good would it be for you to be steering clear of speculative dumpster fires that others are flocking to because they think they carry low risk! So I suppose I need to amend my message to high-powered hedge funds, non-Portfolio123 quants, etc.: "Keep analyzing the heck out of returns, you're good. Don't waste time with (yuck, phooey) 10-Ks and fundamentals."

### **Incorporating Quality into Portfolio123 Strategies**

Considering the importance of Quality, you'd think it would be pretty easy to use such items to enhance a Portfolio123 strategy. Actually, many who have tried it may have experienced the opposite. Many may have found that model performance deteriorates after we add in Quality.

On reflection, though, this makes sense. Let's go back to DDM and see how this works:

$$P = D / (k - g) \text{ or } P/E = 1 / (k - g)$$

High quality suggests an increase in capacity for  $g$ . As  $g$ , a negative number in the denominator rises, so, too, does  $P$ . And as  $g$  rises, so, too does the fair  $P/E$ .

So this is one instance in which higher Quality justifies a higher  $P/E$ . And in this sense, we can live with it. Over time,  $g$  will push  $E$  up thereby helping the stock.

That sounds alluring, but here's the catch: Quality operates on  $g$  in an indirect and often gradual manner. It's stature as a difference maker is something more likely to manifest over months or years, as opposed to days or weeks. So as valuable as Quality-sparked-growth is – and goodness knows it is valuable – its manner of operation leaves the door open for countervailing influences that manifest more immediately. And there is a big-time countervailing influence . . .

High quality is associated with lower beta which in turn is associated with lower  $k$ .

As  $k$ , a positive number in the denominator declines, Fair  $P$  goes up. So, too, does fair  $P/E$ . OK. So far so good.

But what happens if  $k$  rises even as  $g$  goes nowhere, possibly even stays at zero (serious scenario since  $k$  manifest immediately, while  $g$  requires more patience)?  
Answer:  $P/E$  still goes up. Risk reduction is, in and of itself, worth paying for.

Now, we're starting to see things getting scrambled.  $P/E$  goes up. All else being equal, that's bad for stocks. We have enough experience with Value factors to know this. But higher quality equates to higher  $P/Es$ , even without an increase in  $g$ , and now we're told this is supposed to be a good thing. So now we like higher  $P/Es$ ? No wonder data mining seems so alluring: Who needs this? :-)

Here's the deal:

1. For starters, nobody ever said this stuff is easy. If it were, anybody would be able to churn out monster returns, not just in simulation, but with live money. We know things tend to not work that way. So we need to manage our expectations.
2. Because Quality metrics tend to be more stable, we have to assume, unless or until we're face to face with evidence to the contrary, that the market knows what's up and that valuation metrics will be high enough to reflect the lower levels of risk. So we're not going to necessarily expect to make a killing because we discover that a stock has a great ROE, etc. If you're looking to make an impression based on performance, Quality is not likely to be the way to go.
3. Quality is an important measure of risk and should be used as such:

- a. We've already seen how this can be factored into value models, for example, as part of the "all else" that allows low value metrics to work as many naively assume they always should.
  - b. We may be able to think creatively and find way to use quality-inspired factors to lead us to stocks that are in truth, less risky than the market realizes – thus making them ripe for upward P/E revision when the market finally figures things out
4. We can demote returns to secondary consideration and use Quality metrics in furtherance of an effort to make risk moderation a primary goal, something that wasn't likely to excite many during 1999-2014 (and hence which will undoubtedly suppress simulated results), but which started to gain some appeal in late 2015 and seems even more worthy of consideration as 2016 started.
5. Finally, we can do what Warren Buffett did so well; profit from the "Betting Against Beta" anomaly (a product of market "noise" – I'll cover that later).

What all this amounts to is that Quality is often not going to be the primary component of a returns-oriented strategy. While I never want to rule anything out, it does seem that more often than not, Quality will be of most use to us when we use it as a supporting criteria to assist in the implementation of some other strategy (i.e. Value) or to moderate future volatility.

At first glance, that sounds like a consolation prize. Actually, though, we we saw with some examples in the Value Topics, it can make a big difference between a strategy that only works in simulation versus one that also works in the real world. And, of course, risk reduction is, as we've been seeing lately, far from a consolation prize.

Subsequent Portions of this Topic will address the DuPont framework which decomposes ROE into margin, turnover and leverage, earnings quality, a newer emerging area of quality, and some well-known packaged implementations (Piotroski, Beneish) that may inspire you to come up with your own models along those lines.