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The Essential Financial Toolkit*

Tool 9 – Multiples

This article discusses stock valuation using relative valuation ratios, typically referred to as multiples. These multiples are widely used by equity analysts and widely discussed in the financial press. Their popularity is largely due to their simplicity but, as discussed below, this simplicity may be deceiving, may lead to faulty analyses, and ultimately to wrong investment decisions.

Witty Professor (*WP*): Although this is not a course on valuation, today we'll discuss a tool that is very widely used for the valuation of stocks. And the reason we will discuss it is twofold. First, because it is widely reported and discussed in the financial press, so it'll help you understand discussions you may read or hear daily. And second, because this tool is very often used in a simplistic way, which may lead you to make wrong investment decisions.

Insightful Student (*IS*): And what is the name of the tool we'll discuss?

WP: This tool goes by more than one name; some call it 'relative valuation ratios', though much more often you may see it simply referred to as 'multiples'.

* All calculations in this note have been performed in Excel and the results reported are taken directly from the spreadsheet. If you want to reproduce the numbers discussed accurately and avoid rounding errors, you should also perform all calculations in a spreadsheet.

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IS: Why relative valuation?

WP: The tools used in the valuation of stocks can be divided into two categories. The first, which we could call tools of absolute valuation, basically consists of different versions of the discounted cash flow (DCF) model. The second, which we could call tools of relative valuation, basically consists of ratios, more often than not between price and a fundamental variable expressed on a per share basis.

IS: Hold on, what is a fundamental variable?

WP: Fundamental variables, sometimes simply referred to as fundamentals, are the value drivers of a company, those that determine how much a company is worth. Variables like sales, earnings, cash flow, and dividends, among others, all qualify as fundamentals.

IS: Got it. So you were saying?

WP: I was about to say that absolute valuation models focus on the fundamentals of a company and value its stock on the basis of such fundamentals. Relative valuation ratios, on the other hand, value a company relative to something else, which in general we'll call a benchmark.

IS: So a company is cheap, expensive, or properly valued relative to that benchmark?

WP: Exactly, but let's not get ahead of our story. Let me first ask you whether you know any multiples.

IS: I know the price-to-earnings ratio, or P/E ratio, which I often see discussed in the financial press.

WP: Good. Other widely-used multiples are the price-to-book ratio (P/B), the price-to-cash flow ratio (P/CF), the price-to-dividend ratio (P/D), and the price-to-sales ratio (P/S), among others. And they usually have the current stock price in the numerator, and a per-share fundamental variable, like earnings, book value, cash flow, dividends, or sales in the denominator.

IS: So how should we interpret these multiples?

WP: Just a sec. Let me first propose that we focus the rest of the discussion on just one multiple, the P/E ratio, and this for three reasons. First, it is the most widely used. Second, it will make our lives easier not having to repeat each argument several times for each multiple. And third, just about everything we'll say for the P/E, perhaps with a little tweaking here and there, is valid for the other multiples. Having said that, take a look at Table 1, which shows some information on Abbott, Bristol-Myers Squibb (BMS), Johnson & Johnson (J&J), Merck, and Pfizer, all drug companies.

Table 1
(In US$)

	Abbott	BMS	J&J	Merck	Pfizer	Industry
Price	57.9	21.5	71.7	34.8	19.2	N/A
Trailing EPS	2.7	1.1	4.1	2.3	1.3	N/A
Trailing P/E	21.4	19.5	17.5	15.1	14.8	15.7
Growth	11.4%	10.6%	8.0%	6.2%	5.0%	7.9%
PEG	1.9	1.8	2.2	2.4	3.0	2.0

IS: Can you explain the table a bit? At what point in time were those prices taken? What is a trailing EPS or a trailing P/E? What is the time period for those growth rates? What is a PEG?

WP: Sure, I was coming to that. All prices represent what you had to pay, in dollars, for a share of stock of each of these companies in early September 2008. 'EPS' stands for earnings per share and 'trailing' simply means that these are observed or past earnings; in this particular case, these are earnings per share over the preceding 12 months.

IS: Hold on a sec. Why do we bother to add 'trailing' to those EPS? Aren't the EPS always those the company already paid?

WP: Not necessarily. Analysts often forecast the EPS that companies will pay over the next quarter or next year, and even over longer periods. Those forecasted or expected EPS are usually referred to as 'forward' EPS. Just to give you an example, J&J has trailing EPS of $4.1, shown in the table, and forward EPS for the calendar fiscal year 2009 of $4.7, not shown in the table.

IS: So whenever I see a P/E, how do I know whether it's based on trailing or forward EPS?

WP: Sometimes they are simply referred to as trailing or forward P/Es. But if that's not the case, you have to make sure you find out. It may be written in a footnote, or at the bottom of a table, or if you're discussing P/Es with someone else and it's not clear to you, just ask. In fact, let me make a more general point: because it can be so many different things, *always* make sure you know what the 'E' part of the P/E is.

IS: What do you mean?

WP: I mean that the 'P' part of the P/E is trivial; it's just the market price at a given point in time. But the 'E' part is far trickier. It's not only that EPS can be trailing or forward, it goes way beyond that. Some analysts subtract one-time charges from the earnings and some others don't; some use as-reported earnings and others use operating earnings; and if you're making international comparisons, different accounting standards define earnings in very different ways. The

reasons why earnings are not a straightforward number are many and varied, and for our purposes you don't need to worry too much about that, but do keep in mind that you always need to know how the 'E' of every P/E is defined.

IS: Will do. So, going back to the table now, we know what the 'price' and 'trailing EPS' rows show. What about the other rows?

WP: Well, the following row is simply the ratio between the previous two, and we call them 'trailing' P/Es simply because they're based on trailing EPS. And now let me ask you, how would you interpret those P/Es?

IS: I'd say they are the number of dollars we have to pay per dollar of EPS. In the case of BMS, for example, the P/E of 19.5 indicates that we have to pay $19.5 per each $1 of this company's EPS.

WP: Exactly! That's the correct way to think about P/Es. Now, second question, going back to BMS, what does this P/E of 19.5 mean in terms of valuation? Is BMS cheap? Expensive? Properly valued?

IS: No idea. I don't know whether 19.5 is high, or low, or right on the mark.

WP: And the point of my question is, precisely, that you realize that this 19.5 by itself is pretty useless. That's why P/Es are a tool of *relative* valuation; we need to put this number into perspective, relative to something else. Now, what would you compare that P/E to?

IS: The P/E of a competitor?

WP: It's a possibility. So what would you do?

IS: Well, I'd say that BMS (P/E=19.5) is more expensive than Pfizer (P/E=14.8) and cheaper than Abbott (P/E=21.4).

WP: So?

IS: I'm not quite sure. I guess that given those P/Es, if I had to choose between BMS and Pfizer, I'd buy Pfizer; and if I had to choose between BMS and Abbott, I'd buy BMS.

WP: *Careful!!!* This is precisely why I asked that question! Do you think that valuing stocks could be as easy as saying that 19.5 is higher than 14.8 and lower than 21.4! If that were the case, then we'd all be analysts. Even better, we'd all be rich!

IS: I'm not sure I follow you.

WP: What I'm saying is that the analysis you just made, which to be fair is similar to that often found in many financial newspapers and heard from some financial pundits on TV, is not simple, it's *simplistic*. Again, valuing stocks cannot be, and is not, as simple as saying that 19.5 is higher than 14.8 and lower than 21.4. You don't need any financial expertise to make that comparison.

IS: So what should we do instead?

WP: To start with, don't you think that comparing a company that you may be interested in, say BMS, to just one or two other companies is a little limited?

IS: Maybe. Are you suggesting that we should use more companies in the comparison?

WP: In part, yes. But let me make a more general argument. Whenever an analyst is using multiples, he has two critical issues to deal with: first, he must determine the proper benchmarks for the comparison; and second, he must determine why the multiple for the company he's analyzing and the chosen benchmarks may differ.

IS: And what is a proper benchmark?

WP: Let's talk about that first issue. There are three standard benchmarks that analysts tend to use, of which we'll focus on two. The two more widely used are often referred to as a *temporal* benchmark and a *cross-sectional* benchmark; the one we will not discuss is often referred to as a *theoretical* benchmark.

IS: Can you at least tell us what this last one is about?

WP: Sure. It basically consists of a model that tells you what the P/E of a company *should* be; you input the values of some variables on one end and you get the 'appropriate' P/E on the other end. Needless to say, there is not just one but several models for this purpose.

IS: Got it. What about the temporal and the cross-sectional benchmarks?

WP: The *temporal benchmark* is used to assess the current valuation of a company relative to its historical valuation; and you calculate it simply by taking the company's average P/E over the last several years.

IS: What's the point of the comparison?

WP: The point is that if a company and the environment surrounding it have not changed substantially over time, its valuation shouldn't have changed too much either. In other words, similar conditions call for similar valuations.

IS: But as you told us more than once before, the devil is in the details, right?! It's probably not trivial to assess whether we're comparing apples to apples or apples to oranges.

WP: Excellent point! You're absolutely right about that. And this is one of the many reasons why relative valuation is much more than the trivial comparison between two numbers, and why analysts have a substantial contribution to make.

IS: I see. Can you give us an example of a temporal benchmark?

WP: Sure. Although it's not shown in Table 1, I could tell you that between 1990 and 2007, the average P/E of BMS was 24.8, which is quite a bit higher than its current P/E of 19.5.

IS: And what do you make of that?

WP: Not much. And it's important that you don't make too much of it. As we said before, anybody can see that 19.5 is lower than 24.8, but you should not rush to conclude that BMS is undervalued. Obviously, some further analysis is necessary.

IS: And how many months or years should we use to calculate the average P/E?

WP: As you said a minute ago, the devil is in the details, right?! There is no way to say whether you should calculate the average over 10, 20, or more years. Ideally, you should go back enough years so that the average is not heavily influenced by one or two very good or very bad years. But you don't want to go so far back that the average is largely made up of P/Es from years in which the company was very different from what it is now. Here again an experienced analyst can make a substantial contribution.

IS: OK, what about the cross-sectional benchmark?

WP: The *cross-sectional benchmark* is used to assess the current valuation of a company relative to the current valuation of other comparable companies; and you calculate it simply by taking the average P/E of several of these comparable companies. The point of the comparison is, of course, that similar companies should have similar valuations.

IS: What is a comparable company?

WP: A company as similar as possible to the one you're analyzing. But of course this is just an ideal. In practice, as you might guess, comparable companies are hardly ever really comparable.

IS: Which means, again, that it's not trivial to tell whether we're comparing apples to apples or apples to oranges, right?

WP: Exactly. Going back to your previous comparison of the P/Es of BMS, Pfizer, and Abbott, I'm sure you would have a hard time arguing whether or not these three companies are really comparable to each other, although all three are drug companies.

IS: Yes, I think I would.

WP: Of course you would. Which explains why, very often, analysts tend to use broad cross-sectional benchmarks, such as the P/E of the industry of the company they're analyzing.

IS: And that would be the 15.7 shown in the last column of Table 1, which is calculated on the basis of many more companies than those in the table, right?

WP: That's right. And as I hope it's clear to everybody by now, you should not rush to conclude that because the 19.5 P/E of BMS is higher than the 15.7 P/E of the industry, then BMS is overvalued.

IS: Yes, I understand that now. But I have two questions. First, which benchmark should we use, temporal or cross-sectional?

WP: That is not an either/or choice. In fact, the more benchmarks you use in your analysis the more robust it's going to be. Each would provide you with some perspective and give you some insight into the valuation of the company you're analyzing. Second question?

IS: I'm a bit puzzled by the fact that if we use a temporal benchmark, BMS is cheap relative to its historical valuation. However, if we use a cross-sectional benchmark, BMS is expensive relative to its peers. Is that possible?

WP: First, let me stress once again that those two comparisons are far from enough to conclude that BMS is overvalued or undervalued. Second, notice that when you use those two benchmarks you're asking two very different questions, so you should not necessarily expect the same answers. And third, if it happens to be the case that all your comparisons point in the same direction, then your conclusion will be stronger and more reliable; but if that doesn't happen, it at least invites the interesting question of why not, which again will strengthen your analysis.

IS: Gotcha.

WP: Good. Now, remember that we mentioned before that an analyst using multiples has two critical issues to deal with: determining the proper benchmarks for the comparison, and determining why the multiple for the company he's analyzing and the chosen benchmarks may differ. Most of what we've been discussing so far is related to the first issue. Let's move to the second issue now.

IS: If we're going to talk about why a given multiple and the chosen benchmarks may differ, can we go back to where we left the comparison between BMS (P/E=19.5) and Abbott (P/E=21.4)?

WP: Sure. And we'll also discuss, more generally, the comparison between a given multiple for a company and both a temporal and a cross-sectional benchmark. But let's start from where you propose. Earlier when comparing BMS and Abbott, you had tentatively suggested that you'd be inclined to buy the former because it was cheaper, at least in terms of the price you had to pay relative to the EPS of the company, right?

IS: Right.

WP: And I had suggested in turn that your analysis was not simple but simplistic; that it requires no expertise whatsoever to say that 19.5 is lower than 21.4; and that valuing stocks must obviously be harder than that. Now think about where your argument comes from and where it leads to. First, it comes from assuming

that these two companies must be worth the same, or, put differently, that they must have the same P/E. Second, if that were true, it leads to the perplexing conclusion that market participants are doing nothing about the discrepancy in P/Es; and that includes the thousands of very well-paid analysts whose main job is to find mispriced stocks. How plausible is that?

IS: Now that you put it that way, not very plausible.

WP: OK, let's take my two points one at a time, the first one now and the second we'll leave for later. First, is it plausible to assume that these two companies must have the same P/E?

IS: Well, not really. Although they both belong to the same industry, they may have different growth expectations, different risk, and so forth. Actually, now that I think about it they may differ in a thousand ways so there's really no reason why they should have the same P/E.

WP: OK, but let's try to narrow down those 'thousand ways' in which two companies may differ. As a matter of fact, you just suggested two of the main reasons why two companies may have a different valuation even if they belong to the same industry: growth expectations and risk. Therefore, when the P/E of the company you're analyzing and a given benchmark differ, the first thing you need to ask is whether or not the company and the benchmark have the same growth expectations and risk. And you should do that regardless of the type of benchmark you're using.

IS: I think I understand the general argument but can you give us an example?

WP: Sure. Let's go back to your comparison between BMS and Abbott and to your conclusion that BMS is a better buy. That's a conclusion you can't draw simply by comparing the P/Es of these two companies. Yes, BMS with a P/E of 19.5 is cheaper than Abbott with a P/E of 21.4. But isn't it possible that BMS is riskier than Abbott? Isn't it possible that Abbott is expected to grow faster than BMS? And if either of these two things or both were true, wouldn't it make sense to pay more for a company that is less risky or expected to grow faster than the other?

IS: I guess it would.

WP: It sure would. And that's why, when you get right down to it, a proper analysis with multiples always involves some fundamental analysis. You must analyze fundamentals to understand whether the differences in valuation you're observing in the market are justified or not.

IS: OK, let me see if I understand. You're saying, first, that we should stay away from simply comparing a P/E and a benchmark and draw from that comparison a conclusion about whether a company is mispriced or properly priced. You're also saying that the reason we shouldn't do that is because there may be good reasons why the P/E and the benchmark may differ, two of the main reasons

being differences in expected growth and risk. And you're finally saying that when we start looking into those two and perhaps other fundamentals, at the end of the day we end up engaging in fundamental analysis. Bottom line, valuation with multiples may seem simple but at the end of the day, when done properly, it involves the analysis of fundamentals, which is very far from just comparing two numbers. Is that a fair summary of your points?

WP: It's a *fantastic* summary of my points! I would only add that you should always look at the comparison between a P/E and a benchmark as the *beginning,* not the end, of your analysis.

IS: Roger that, but I have a question. Suppose I'm considering a company, say BMS with its 19.5 P/E, and I'm using a temporal benchmark, like the 24.8 over the 1990-2007 period you mentioned before. So in order to try to explain the difference between these two P/Es I look into whether the growth expectations of BMS are better or worse than its past growth, or whether it's more or less risky than it's been in the past. And suppose that, to strengthen my analysis, I do something similar for a cross-sectional benchmark like the 15.7 on Table 1, and I consider differences in growth expectations and risk between BMS and the other drug companies in the industry. What if I look into those and perhaps other fundamental variables and still can't explain the difference between the P/E of BMS and these benchmarks?

WP: Good question. When you compare a P/E and a benchmark through a fundamental analysis, you have two possible outcomes. One is that you do find the variable or variables that explain the difference in P/Es; you may find, for example, that BMS is now cheaper than it's been historically because the company is expected to grow in the future at a lower rate than it did in the past, or is expected to be riskier than it's been in the past. In that case, then, there is no trading opportunity; that is, you did find why the multiple and the benchmark differ, and why the company is properly priced despite this difference.

IS: And if I can't find anything that explains the difference in P/Es?

WP: Well, in that case you may have found a trading opportunity. If after a thorough analysis you were not able to explain the difference between a P/E and a benchmark, it is possible that the market is not valuing properly the company you're analyzing, in which case it's a good opportunity for you to trade and take advantage of the mispricing. But you should always be careful, and even a bit skeptical, when you find yourself in this second case.

IS: Why?

WP: Well, whenever you conclude that a stock is cheap or expensive, and therefore a good stock to buy or sell, you have to ask why the thousands of people whose job is to find mispriced stocks do not agree with you. And I say that they must not agree with you because if they did, they'd be doing the same trades that you

have in mind, pushing prices in such a way as to eliminate the trading opportunity.

IS: Wait, wait, wait, I didn't get that last part. Can you explain that again?

WP: Sure. Suppose you think that a stock is cheap and therefore a good buy. And suppose that many analysts out there share your view. Well, what they'd do is they'd buy shares in the stock, pushing up its price, and giving you less reason to think that the stock is cheap. And of course, as long as your assessment is the same as theirs, they'll keep buying until the market price reflects the price that both you and they think is the right one, at which point the stock will no longer be cheap but properly priced.

IS: And what if my assessment and their assessment of the 'right' price is different?

WP: Well, then we're sort of back to square one and you have to wonder how it's possible that you have a better insight than that of highly-paid, well-informed, well-connected, and very knowledgeable analysts.

IS: I see. So you're suggesting that we should not try to find mispriced stocks, right?

WP: Well, I wouldn't go that far. I guess what I'm suggesting is that you keep in mind what Peter Lynch, the venerable former manager of the Fidelity Magellan fund used to say: "What makes stock picking difficult ... is that 1,000 people smarter than you are studying the same stocks you are." Sounds plausible?

IS: It sure does, particularly coming from one of the best stock pickers in history!

WP: Well, we seem to be running out of time. Any final questions?

IS: Two quick ones. First, more than once I've seen in the press a reference to something called the PEG ratio, which I also see in Table 1. Can you at least very briefly explain that magnitude?

WP: Sure. The PEG is a multiple devised to account for the differences in growth between a company and a benchmark. It is simply the P/E ratio of a company divided by its expected growth; that is, PEG = (P/E)/g, where g denotes the expected annual growth in EPS. Because, as we suggested earlier, a company may be more or less expensive than a benchmark simply because it is expected to grow faster or more slowly, the PEG incorporates this differential growth. And of course, the lower the PEG, the more attractive the company, simply because a lower PEG indicates a cheaper company or one that is expected to grow more quickly.

IS: Can you give us a quick example?

WP: Sure. The last two rows of Table 1 show the expected annual growth in EPS five years ahead and the PEG based on that expected growth. The PEG of BMS, for example, is simply calculated as 19.5/10.6 = 1.8. And notice something interesting: the naive comparison between the 19.5 P/E of BMS and the 15.7 P/E

of the industry suggests that BMS is expensive relative to the industry. But note that BMS is expected to grow its EPS at 10.6% a year, much faster than the industry's 7.9%. Therefore, once you factor in this differential growth, the 1.8 PEG of BMS is lower than the 2.0 PEG of the industry, thus making BMS relatively more attractive than the industry. Do you see now how a simplistic comparison may be misleading?!

IS: I do! But that's not the end of the analysis, is it? Because then we would have to inquire into differences in risk and other variables that may strengthen the conclusion that BMS is attractively priced relative to the industry, or that may turn that conclusion around.

WP: Exactly! I'm glad to see that you're beginning to grasp how to properly implement a valuation by multiples! Your second and final question?

IS: Simply that our whole discussion was from the perspective of valuing a company, but I assume that P/Es can be used in similar ways to value markets, right?

WP: Yes, good point. Just about everything we said about P/Es and the valuation of companies is also valid for the valuation of industries, sectors, regions, or markets, as long as you have an aggregate multiple for each of them.

IS: Ready for the wrap-up then!

WP: Good. Multiples, which are widely used by analysts and widely reported in the financial press, are used to value stocks relative to one or more chosen benchmarks. These multiples are often used in a simplistic way by naively comparing two numbers and drawing premature conclusions that may lead to wrong investment decisions. There may be good reasons why a multiple and a benchmark may differ, and differences in expected growth and risk are the main suspects. Once you start considering these and other variables, you end up engaging in fundamental analysis, at which point valuation by multiples ceases to be the simplistic comparison many seem to think it is. And if I heard correctly, the bell that just rang suggests that our time is up for today!