Portfolio123 Virtual Strategy Design Class
By Marc Gerstein

Topic 1D – Beyond Value, The Other, Noisy, Component of Price

I've said several times that in the stock market, P = V+N, or Price = Value + Noise.

Those who believe P=V and dismiss all else as ignorance, hysteria, manipulation, voodoo, etc. are the ones who are failing to see and apt to wind up taking untenable positions (witness, for example, the long-term doctrinaire AMZN shorts who have been howling on site like Seeking Alpha that overvalue AMZN stock must fall. They have erred in two respects. First, they misapply value; they have not necessarily approached V correctly. (We'll get to that soon) More importantly, though, they dismiss N as something illusory that must vanish.

This topic will discuss the relationship between V and N based on a framework offered by Robert Shiller. Then, the fun: I offer an approach to actually computing the percent of a stock price attributable to N. There are countless ways to do this. I'll offer one simple approach.

True or False: Price Equals Value

False!

In fact, price is equal to value plus something else.

To understand what "something else" is, we can start with *Stock Prices and Social Dynamics*, Nobel Laureate Robert Shiller's 1984 Brookings Paper on Economic Activity (Vol. 2). Skipping all the intricacies, he describes demand for stocks as the sum of demand from each of two groups; smart money investors (those who make decisions based on value-relevant information subject only to wealth constraints), and ordinary investors, those who "do not respond to expected returns as optimally forecasted" (page 477), or in other words, everybody who is not a smart-money investor.

Put in simpler terms, we could say total demand for stocks is the sum of demand from those who use value plus demand from those who don't. That seems obvious. The impact of Shiller's framework is to present the latter, not as a collection of dark forces to be overcome by information and education, but as a normal part of the stock market's equilibrium state. This is vital.

So if, for example, you've been short Amazon.com ($AMZN), Tesla ($TSLA) or some other stock like that which seems to be priced way out of proportion to any discernable notion of value (a possibly oversimplified statement, but for purposes of this article, let's just accept it), this may give you a clue why so far, except for some little down drifts here and there, you've been disappointed.

If you take financial exposure based on a proposition that stocks like that have too eventually move toward valuation and that the whackos who overpay will eventually get their comeuppance, well, that is not necessarily a good idea. According to Shiller (not to mention mountains of evidence based on market experience), the ordinary investor component of stock prices is an inevitable part of the market and cannot be expected to vanish. And shortly afterward, Fisher Black (*the* Fisher Black from the Black Scholes Merton option pricing model who was likewise well known to the Nobel committee but couldn't get the prize because it isn't awarded posthumously, but his partners got the prize for work on the model that bears his name) pointed out that this sort of non-rational value-based trading, which he referred to as "noise" was essential to the proper functioning of the stock market. If it didn't exist, if traders did only what was "right," nobody would ever sell since nobody would make a trade that would, by definition, be a mistake. "Noise trading provides the essential missing ingredient . . . . With a lot of noise traders in the market, it now pays for those with information to trade. It even pays for people to seek out costly information which they will then trade on." Fisher Black, Noise Papers and Proceedings of the forty-Fourth Annual Meeting of the America Finance Association, New York, New York, December 20-30 1985, Journal of Finance, Vol. 41, Issue 3 (July 1986), pp. 529-43 at 531.

Going back to Shiller, he didn't simply take note of the inevitable presence of ordinary investors. He evaluated their strength in the market relative to that of smart money. There's a bunch of wonky math involving Greek letters (as there always seems to be when academicians start writing) and elaborate fractions with lots happening in both numerators and denominators. I'm sure you'd be happy to have me skip all that and get right to the punch line. So here goes:

- The relative roles of smart money and ordinary traders vary based on "arbitrage costs," which consist of
    - Trading costs (commissions, slippage)
    - Holding costs (the costs of maintaining a position)
    - Information costs (the costs of getting the information needed to acquire and monitor a position)

For our purposes, let's ignore trading and holding costs and pretend that information costs are where we should focus. (That makes sense since trading costs and interest raters are a heck of a lot lower than they used to be.) Also, consistent with the work of Stanford's Dr. Charles M.C. Lee, we'll extend Fisher Black's terminology and henceforth refer to smart money as "value" and ordinary investors as "noise."

According to Shiller's equations, the relationships between arbitrage/information costs and other factors are such that:

- As information costs approach zero, the Noise impact on stock prices likewise approaches zero and the influence of Value rises
- As information costs rise and approach infinity, the Noise impact on stock prices will likewise rise and approach 100% and Value will become less of a consideration and eventually vanish

You see this in the day-to-day market all the time. Rising information costs doesn't simply mean higher prices for data, news, research, etc. Think of the word "cost" in broad terms. High information costs also encompasses an inability, for one reason or another, to compute a credible valuation. When credible valuation analysis is not feasible, the Noise tends to play a greater, and sometimes exclusive, role in setting stock prices.

- Think $AMZN, where profit is depressed and likely to stay so for a period of time not known to corporate outsiders due to deliberate company spending to build new kinds of businesses.
- Think $TSLA, where nobody really knows what the company will earn within any reasonable time frame because there is no precedent for the company's business.
- Think developing market equities, where information can be skimpy and less than fully trustworthy.
- Think emerging pre-commercial research-oriented biotech companies whose ability to pay bills depends on periodic cash infusions from the raising of new capital and/or advances from venture partners.)
- Think small U.S. companies whose business profiles are still emerging and for which Wall Street and media coverage tends to be modest.

Conversely, when information is ample and valuation analysis is highly feasible, "Value" asserts itself in price-setting leaving little, sometimes very little, room for noise. Anybody who has tried to develop strategies to beat the S&P 500 knows what I mean. Those stocks benefit from massive levels of information flow and analysis. If you aren't working there with reference to serious valuation assumptions, you could be in for a tough time because many other investors are, meaning that Value is a very prominent part of the stock price.
So getting back to our initial section heading, when it comes to stocks, price equals value plus something else. We've now identified the something else as "Noise". Therefore, we can and will say Price equals Value plus Noise, or P = V + N.

Is All Noise Good Noise?

So what about the likes of $AMZN and $TSLA – really. Does recognition of the role of noise in their stock prices make them Buys? If so, how do we distinguish those situations from so many others we saw in and around internet and tech back around 2000? Those stocks clearly could not be justified in terms of value. Many of those

issues were all noise all the time. And there, the noise fizzled, and so too did many brokerage account balances. What's the difference?

Warning: You may not like the answer I'm about to give.

There is no simple, or even complicated, formula. This is a very hard question, perhaps the hardest question investors face. For better or worse, the answer is: It depends on the credibility or reasonableness of the "stories" that give rise to the noise.

That's it. That's all I can give you. But it's a lot. What it means is that if you see an article slamming $TSLA or $AMZN because they are overpriced, right away you know the author missed the point. You have to make a yes-or-no decision on such stocks by evaluating the reasonableness of the stories. In my opinion, the difference between $TSLA and $AMZN and the old new-economy garbage was just that; the credibility of the stories. In fact, I might even say the difference reflects that fact that those who are bullish on $AMZN or $TSLA even bother to develop stories. Back in the late 1990s and early 2000s, you rarely, if ever, heard much at all other than quips to the fact that value no longer matters (As I recall, I believe Motley Fool used to say that to be a so-called "rule breaker," a good thing to be in their eyes, you had to favor stocks that were "significantly overvalued" based on conventional metrics. So essentially, the difference between good, noise, investable noise so to speak, and bad, dangerous, noise is the difference between a sensible presentation of business prospects, or at least as sensible as possible given difficulties in applying normal valuation yardsticks, versus just-plain idiocy.)

Believe It or Not, We Can Quantify Noise and Value!

How would you like to be able to look at a stock price, any stock price, look for a few data-points on free web sites of your choice, plug the numbers into a spreadsheet that's so simple it can easily be stored and run on smartphone spreadsheet app, and immediately calculate the percent of the stock price that's attributable to noise and the percent that's attributable to value. Guess what: You can! And I'm going to show you how to do it right now.

What we'll do is compute the value component and say whatever is leftover is noise. So the choice we need to make is how to compute value for this purpose.

I'm not going to use the Dividend Discount Model or anything like it. Because of the particular nature of this task, I'm not necessarily trying to present my idea of what the stock is really worth. What I am trying to do is tease out the components of stock pricing that are solid versus fluid, firm versus debatable, easily identifiable versus more obscure, etc.

In pure theory, we know that growth counts, big time – it's the main thing that separates stock from bonds. But we also know it's the part of valuation that's most debatable. So I'm going to consign this to noise.

Capital structure is another issue. How much risk is it really adding? That's also in the realm of the debatable. So I'm not going to include this in the calculation of value for this purpose. Instead of valuing the complete company, I'm going to try to value the day-to-day business. Analysis of the other "stuff," (capital structure, non-operating investments, etc.) will be left to the debatable, noisy, component of the stock price.

What I'm going to do is compute what I refer to a "standstill" value. What is the value of the business today assuming it stays in place forever?

That, actually, is analogous to the way we compute the market price of a bond. Suppose we have a bond that pays interest amounting to $65 a year. The face or maturity value is, by definition, $1000 but we know market conditions fluctuate throughout the time the bond is outstanding and may influence prices that can be obtained if the bond trades in the secondary market. Suppose the world is such that a buyer of the bond would insist on getting an annualized return of seven percent. If that's the case, the bond would sell for $928.57. We compute this using the following formula:

- V = I / RR
    - V = value
    - I = income ($)
    - RR = required return (%)

We're going to compute the standstill value of a company's business the same way:

- V = NOPAT / CC
    - V=value
    - NOPAT = net operating profit after tax
    - CC = cost of capital (%)

- NOPAT = OI * (1 – TX)
    - OI = Operating profit, or EBIT, earnings before interest and taxes (%)
    - TX = tax rate (%)

Once we have V, we can easily get noise (N):

- N = P – V

From that, we understand that:

- V% = V / P, and
    - V% = percent of stock price attributable to value
- N% = 100 – V%
    - N% = percent of stock price attributable to noise

If we want a single Excel-type formula for N%, you can do this (assuming percentages are expressed in decimal form):

- N% = 1 – (OI * (1 – TX)/CC) / P

It's just that simple. You can look up operating profit, tax rate and price on web sites. CC is something you'll simply have to assume.

Well, actually, it may or may not be simple depending on you.

- **OI (Operating Profit)**

This is usually straightforward. But sometimes, you may have to make a common-sense judgment. If there is some reason why you think the latest 12 month's operating profit is not likely to be sustainable, you might choose to adjust it upward or downward to what you think is a more representative figure. This is not cheating. Quite to the contrary, it's highly desirable. Graham & Dodd, often seen as the ultimate value gurus, devote far more ink in their classic text to the process of adjusting reported earnings to a more analytically appropriate figure. (They know PE is a way too simple formula to be seriously useful to anyone who wants to make money in the market. You succeed or fail based on how you decide what to use for E.)

- **TX (Tax Rate)**

Very often the reported number (easily found in web sites) is fine. But there will be many occasions when it's not, when it's impacted by any one of who-knows-how-many things companies can do to slash the tax bill, or may be forced by the law to do that inflates the tax rate. Remembering the quote from the a previous installment in this series about it how being vaguely right is preferable to being precisely wrong, it's fine to completely refrain from looking up the actual tax rate and simply plugging in a standard number, such as 35% (0.35). You could easily consign the non-standard part of the tax rate to factors that can be included in noise.

- **CC (Cost of Capital)**

If you've taken a serious finance class, you know what this is (the weighted average cost of capital, or WACC). But you also know how brutal the calculation is. There is no shortage of textbook definitions for cost of equity, but in the real world and for reasons that are far beyond the scope of this series, it's impossible to come up with a

bona fide credible number. If you want to pull something out of the seat of your pants based on your sense of the market, say nine percent: just do it. (If you want to get a bit fancier, you can use the actual company-specific capital structure weights for debt, preferred equity and common equity multiplied by seat-of-the-pants across-the-board assumptions for cost of debt, cost of preferred and cost of equity. My experience building and testing models on Portfolio123 that use CC has shown me that you might gain a bit of extra performance by using a CC that reflects company-specific capital-structure allocations, but that you don't gain much if anything more driving yourself crazy trying to estimate a company-specific cost for each kind of capital item.)

- **Oddball Numbers**

If operating profits are negative and you believe it's not just a temporary oddball thing, then you can jump right to the conclusion that 100 percent of the stock price is attributable to noise. $TSLA is a good here-and-now example; operating profit in the last 12 months was negative $245 million and the item has never yet been in the black. And we know an investment case here stands or falls depending on whether you buy into its electric vehicle. So the notion that it's stock price is explained 100 percent by noise is perfectly credible.

Along similar lines, if you find a company for which equity is negative (which absolutely positively can and does happen such as when lots of accumulated net losses pull the retained earnings portion of equity below zero, then just say 100 percent of the stock price is attributable to noise.

You may, at times, compute a level of noise that turns out to be more than 100 percent of the stock price, meaning the percent attributable to value would be negative. That's OK. It is what it is. It's an indication of how unenthusiastic the market is about the business. Sometimes Mr. Market is right and the company deteriorates in the future. Other times, Mr. Market misses the boat. Treat it just like any other kind of noise; evaluate the credibility of the stories that are out there (or use technical analysis to discern and in effect ride piggyback on the story assessments made by others).

- **Full Out Simplification**

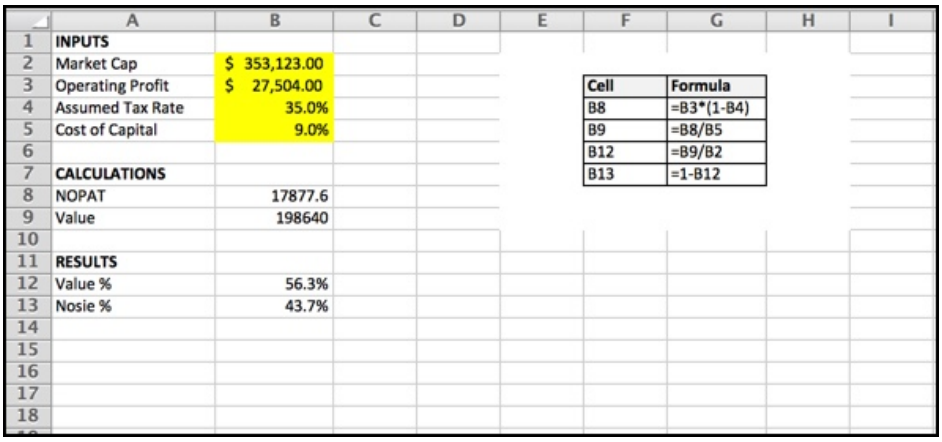
If you want to go full out on simplicity (which is a very reasonable thing to do), you can state the Noise Percent formula as follows:

- N% = (1 – (OI * (.65))/.09) / P

A Spreadsheet Version

If you want to create an Excel spreadsheet, here's what it could look like. (The cells highlighted in yellow are the manual inputs.)

Figure 1



	A	B	C	D	E	F	G	H	I
1	**INPUTS**								
2	Market Cap	$ 353,123.00							
3	Operating Profit	$ 27,504.00							
4	Assumed Tax Rate	35.0%							
5	Cost of Capital	9.0%							
6									
7	**CALCULATIONS**								
8	NOPAT	17877.6							
9	Value	198640							
10									
11	**RESULTS**								
12	Value %	56.3%							
13	Nosie %	43.7%							
14									
15									
16									
17									
18									

Cell	Formula
B8	=B3*(1-B4)
B9	=B8/B5
B12	=B9/B2
B13	=1-B12

Some Real-World Illustrations

Table 1 shows value-noise computations I did on 5/20/15 based on the simplest approach, an assumed across-the-board tax rate of 35 percent and an assumed cost of capital of nine percent.

Table 1

Ticker	Name	% Stock Price Attributable to	
		Noise	Value
AAPL	Apple Inc	38.4	61.6
AMZN	Amazon.com Inc	98.4	1.6
BBY	Best Buy Co. Inc.	14.5	85.5
CAT	Caterpillar Inc	-3.9	103.9
CL	Colgate-Palmolive Co	51.8	48.2
EBAY	eBay Inc.	63.6	36.4
FB	Facebook Inc	84.5	15.5
GE	General Electric Co	47.9	52.1
GOOG	Google Inc	66.2	33.8
KO	Coca-Cola Co (The)	57.6	42.4
LULU	lululemon athletica inc	69.6	30.4
MCD	McDonald's Corp	42.5	57.6
MMM	3M Co	50.1	49.9
MSFT	Microsoft Corp	47.6	52.4
NSC	Norfolk Southern Corp	14.4	85.6
SBUX	Starbucks Corp	71.3	28.7
T	AT&T Inc	47.2	52.8
WMT	Wal-Mart Stores Inc	21.7	78.3
XOM	Exxon Mobil Corp	45.1	54.9
YHOO	Yahoo Inc	97.0	3.0

as of 5/20/15
From Portfolio123 using Compustat Data

Table 2 shows sector-median estimates for the portion of share prices/market caps I estimate to have been contributed by Value.

Table 2

Sector	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	4/1/2015
Consumer Discretionary	63	57	62	56	76	67	71	66	67	55	55	51
Consumer Staples	65	56	57	55	70	75	73	72	65	52	50	48
Energy	61	56	69	72	72	114	62	56	79	61	54	80
Financial	90	85	83	101	122	100	103	108	110	94	94	89
Healthcare	49	41	43	41	49	67	68	59	58	49	45	48
Industiral	55	54	59	56	66	81	61	64	75	56	54	55
Materials	65	75	73	68	82	75	63	73	82	62	56	57
Technlogy	35	36	37	35	48	48	48	58	54	43	43	41
Telecommunications	69	71	80	60	89	97	94	79	89	83	71	74
Utilities	93	77	75	81	87	105	94	90	79	75	74	71

From Portfolio123 using Compustat Data

Essentially, the amount of noise shows you how much you need to sweat when it comes to the underlying business story. Look up and down Table 1 and see if that makes sense to you. Table 2 provides some interesting context.

Note, too, that analyzing noise need not be exclusively qualitative. There's often a method to Mr. Market's madness, so much so that there are data sets that can be analyzed to help one get a handle on this sort of thing. Case in point: technical analysis based on price/volume information. Ditto data sets relating to estimate

revision, short interest, momentum, and so forth. One strategy I developed on Portfolio123 calls for screening the smaller-cap Russell 2000 universe (where noise is expected to be more prevalent to less intense analyst and media attention; i.e. higher information "costs") for stocks for which noise makes an atypically low contribution to price, and then, look for data characteristics that seem consistent with the idea that noise might grow and in a bullish direction, sooner rather than later. I'll present strategies like this, as well as some stock ideas, in future TalkMarklets articles. But in terms of a general primer . . .

No Longer a Mystery

This concludes this introductory series explaining how stocks are priced. As you've seen, the process is not even close to being precise. But it's far from random; in fact, it's very sensible. Any stock price any time can be evaluated under a logical framework. While it's not easy (if it was, we'd all be stock-market winders 100 percent of the time), it's a heck of a lot better than flailing about with no understanding of the factors that influence price. Our inability to see into the future makes investing is hard under the best of circumstances. There's no reason to make it harder by not at least considering the relevant issues. As difficult as it can be to get the right answers, it becomes much harder when one isn't at least asking the right questions.