



Bottom Up Valuation in Global Asset Allocation

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Objective Measures vs. Subjective Projections

Value managers make their living by focusing upon objective measures of value. The measures are “objective” because they stand upon *observable* quantities such as current and past earnings, cash flow, book value, or dividend payouts. Firms are valued for their *proven* ability to generate economic rewards. The weakness with such an approach, if there is one, is that it is backward looking. Equities are, of course, properly valued for their future, not their past, profits. Growth managers take this issue to heart and place far more emphasis on what profits they think may be generated in the future.

Since future profits cannot be observed, growth managers must rely upon opinion, and while it makes much better intuitive sense to rely upon future rather than past profits to value equities, it may be inferior in practice. This represents the essential difference between value and growth managers. There is no debate over which approach is better conceptually: both would agree that, in concept, firms should be valued by their future earnings. What is debatable is whether the noise inherent in earnings estimates exceeds the errors inherent in an approach that assumes that the future will look like the past.

Academic work has had something to say about the errors associated with forecasting future earnings, particularly with respect to the relative merits of analysts near-term and long-term earnings forecasts. The evidence suggests that near-term earnings forecasts do contain information that may help in stock selection, but that long-term

earnings forecasts add no value.¹ This does not, in itself, resolve our question about the relative merits of relying upon known past quantities versus forecasts of unknown future quantities. The fact that near-term earnings forecasts are useful is encouraging, but does not go far toward answering the question about the relative merits of the two approaches.

As near-term earnings expectations tend to look a good deal like recent, realized earnings, it may just be the case that earnings expectations derive their usefulness from what they share in common with trailing, or realized, earnings. In this case, there may be nothing of *additional* value in the use of forward-looking earnings forecasts. Whether that is the case or not is an empirical question that can be answered.

We’ve written before about our use of valuation in our US equity work. What we wish to share with you here are some observations about its pertinence to our Global Asset Allocation work. What’s important is that:

- A bottom-up approach to valuing equity markets at the index level adds alpha.
- A bottom-up approach allows us to adjust to the evolving nature of equity indices. As the sector mix shifts, or as an index grows more or less concentrated, for example, a bottom-up model can adjust naturally to such shifts.
- Analysts forecasts, while ineffective if used on their own, are a useful complement to more objective principles of valuation

¹ “Higgledy-Piggledy Growth,” Ian M. D. Little (1962), and “The Level and Persistence of Growth Rates,” Chan, Karceski and Lakonishok (2001)



Valuation and the Asset Class Decision

In our Global Asset Allocation work, valuation has always played a central role, and our own research has supported the use of objective measures of value over the use of subjectively determined earnings forecasts. To begin with, the objective measures have worked! This is true not only for First Quadrant, but for other practitioners of Domestic TAA, where simple metrics of value based typically on something as simple as a ratio of trailing earnings to bond yield have led to successful shifts into and out of stocks when valuations have become too high or too low. Because consensus earnings forecasts tend to have a cyclical, trend following character to them, the use of forward-looking earnings expectations based upon IBES consensus earnings forecasts, for example, tends to diminish the effectiveness of valuation in timing these shifts.

At the global level, valuation has also been very successful as an asset class indicator for shifting between stocks, bonds and cash globally. Here too, the use of consensus earnings forecasts proved to deteriorate the results of the asset class decision, so objective measures of value were preferred. Valuation based on trailing earnings worked well over long horizons. It correctly suggested a bullish posture on global equities throughout most of the 1990's (starting in 1993), but then "correctly" began to suggest that stocks had grown overvalued by January of 1999. We put quotes around "correctly" because while valuation was right to suggest that prices would fall from those levels (MSCI World price today is, in fact, at levels last seen in November 1998), it was nevertheless five quarters early.

We don't believe valuation is a timing tool as some perhaps do. Rather, we expect markets to rally in a somewhat unpredictable fashion beyond fair value, leaving valuation to get us both out of and back into markets a little early. Timing is what the array of other factors in our models seek to do by focusing on shorter-term return prospects, and by trying to find some predictable characteristics in the way that markets

overshoot fair value. In the case just described, our models did not actually turn bearish on equities until a full year after the valuation component of our models had suggested equities were overpriced. Rather than being five quarters early as the valuation component was, the other factors caused our models to be only four or five months early after having been generally overweight global equities for years.

Where valuation has had less to contribute is in the selection of countries within the equity asset class. Our own models have had some difficulty with this in the distant past specifically because long-term valuation has failed to work well in choosing *among* equity markets. In the mid-1990's, for example, Japanese equities looked very cheap relative to US equities. Our valuation model got that one dead wrong. The "more expensive" US equities significantly outperformed the "cheaper" Japanese equities. While this was the most extreme example of where valuation has sometimes failed to perform well in country selection decisions, there are many similar, albeit less significant examples that we can point to. Overall valuation has been a positive, but weak contributor in this regard.

Blending Analysts' Near-term Forecasts With Objective, Long-term Expectations

Compared to asset class selection, country selection within the equity asset class is much more like stock selection within an equity market in that what we care about is the *relative* prospects within the asset class. Any biases that pertain to the asset class as a whole, e.g., analysts' tendency to overestimate future growth prospects, lessen when comparing assets on a relative basis to the extent to which the bias is consistent across all assets. Our chief concerns about analysts' forecasts dissipate when we instead consider the relative attributes of stocks within a market, or markets within an asset class.



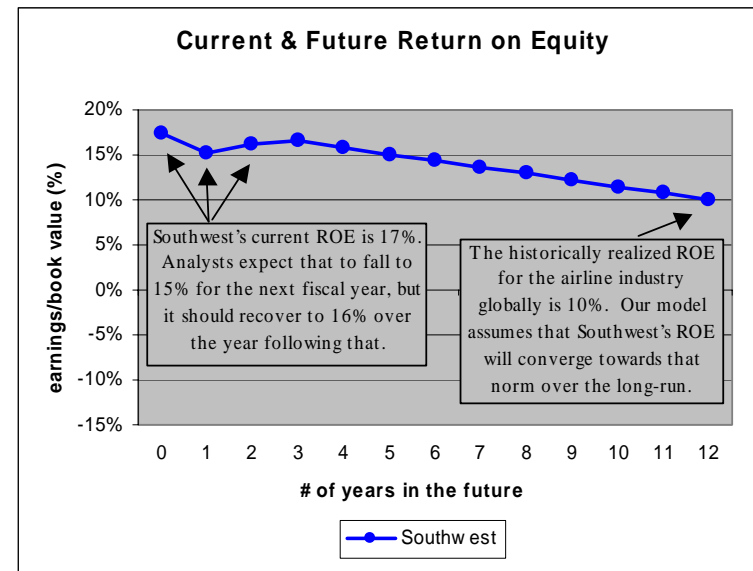
We have found that the near-term component of analysts forecasts are, in fact, useful on a relative basis for individual stock selection in our US and Pan European equity work. It bears asking, therefore, whether the principles applied in our stock selection work can be exploited in country selection. This has strong intuitive appeal. For example, when air travel, and therefore airline profits, were certain to plunge in the post-World Trade Center attack world, or when Japanese banks are certain to have to write off a large number of non-performing loans, measures of trailing earnings seem less and less relevant basis for forming near-term earnings expectations. It is hard not to think that such variations in near-term prospects away from long-term expectations need to be taken into account.

Ideally, a valuation measure would be one that is forward-looking without being overly subjective. As we've said, analysts' earnings forecasts suffer from two serious problems: (1) they are persistently too optimistic; and (2) they are mere noise out beyond two or three years into the future. The first problem becomes far less relevant when looking at relative valuations since all stocks are likely to suffer from a similar excess optimism in analysts' forecasts. The second issue leads us to look for a more objective basis upon which to base our longer-term expectations for corporate earnings. In our work, we have chosen to use the long-term *realized* return on equity (ROE) for the industry as a basis for forming our long-term earnings expectations for individual stocks, and we have found that this approach is more powerful than using firm-specific information for the long-term expectation.

Take the example of Southwest airlines in October of 2001, for example, i.e., right after the World Trade Center attack. Over the previous fiscal year, Southwest had realized earnings equal to 17% of its underlying book value, i.e., it had a ROE of 17%. Looking forward, analysts' forecasts had responded to expectations of reduced air travel and reduced profitability for airlines by effectively lowering

the expected future ROE to 15% for Southwest over the next fiscal year. Southwest's profits were expected to continue to be below current profits two years out, but analysts did expect to see ROE bump up to 16% in that second year.

In our work, we use these near-term analysts forecast for the near-term projected earnings. The longer-term, expected ROE comes from



the observed, historical, industry mean ROE. For the airline industry, the historical mean ROE has been 10%, which implies that Southwest's ROE has exceeded the industry average. Rarely are individual firms able to outperform their industry indefinitely, so we assume that over the next twelve years, Southwest's ROE will converge to the industry average as the chart demonstrates.



Applying these ROE expectations over the life of the stock, we can use a modified version of a discounted cash flow model² to derive an internal rate of return (IRR), essentially the cost of capital to the firm. We calculated this yield to be 5.8% for Southwest Airlines, which compared at the time to 6.4% for the broad US market. By implication, investors are lending capital to Southwest at a lower rate than average, which can be interpreted to imply that a lower discount rate or risk premium is applied to Southwest. Relatively speaking, Southwest is a more expensive stock than the average from this perspective.

Valuation Used For Country Selection

By applying this same work at the country level, we can derive the internal rate of return at the market index level. Since there are important differences in accounting methods across markets, and since we would assume there are persistent differences in the risk premiums associated with different markets, we don't want to compare IRR's directly. Instead, we have interpreted the historical *average* differences between IRR's to reflect upon these structural differences, and look for IRR's that deviate from their average difference from other markets' IRR's. Canadian equities have, for example, shown an average IRR over the last 10 years just above that of the US - 6.7% for Canada versus 6.3% for the US. Our model assumes that the 40 basis point differential in IRR will persist in the near-term. This also addresses any residual biases caused by different levels of optimism implicit in the analysts' estimates for each market.

This bottom-up approach allows us to tailor our value measure for specific indices in ways that we could not do before. For example, differences in the constituents of the local index upon which stock index futures are based and the MSCI index upon which many benchmarks are based can be taken into account in calculating

valuation. We don't want to buy Hong Kong equity futures just because the MSCI index looks cheap. We want to buy Hong Kong futures if the Hang Seng index looks cheap.

Changing sector weights have been an important issue in the evolution of indices over the last decade, particularly as markets such as Finland, Sweden, and Canada had become more concentrated in the technology sector in the late 1990's. As the sector exposures of an index change, the bottom-up approach to valuing equities at the index level naturally adjusts for the differences in the constituent list.

These issues naturally lead to a different valuation factor than the top-down approach of using stock earning yield. How different are the IRR's from a conventional stock earnings yield that may be based upon trailing twelve-month earnings? The differences range from modest (in markets such as the US and the UK where the correlations between IRR and stock earnings yield are 75% and 66% respectively over the last 10 years) to correlations that are negative (such as a correlation of -10% in Italy!). In most markets, however, the correlation is 50% or higher. The differences thus are low enough to be important, but high enough that the general trends remain largely intact.

So how well does this bottom-up approach to valuation do? First we must consider our expectations. Valuation moves typically in long cycles, so we don't expect it to have a high monthly information ratio (ratio of value added to tracking error). Nevertheless, we'd expect to see it add value at the margin to a process that relies on more than just relative valuation. The simple Equity Risk Premium, which works so well as a tool driving asset class tilts between stocks, bonds and cash does indeed add value when driving the country selection decisions, but it doesn't add much. This factor, which is defined as the difference between the current earning yield on stocks (12mo trailing earnings divided by current price), would have added about 9

² "Accounting Diversity and International Valuation", Frankel and Lee (1999).



basis points per year over the last 10 years in a global equity portfolio composed of stocks in the eleven³ most liquid, developed equity markets where the futures have CFTC “approval,” (i.e., are not restricted from use by US pension funds under ERISA guidelines) if run at a risk level (annualized tracking error) of approximately 3%. Such an indicator struggled during the bubble in 1998 and 1999, but recovered in 2000, and then gave back a little alpha in 2001. Our Global TAA product behaved in precisely that way over those years, in fact.

Had we used a bottom-up approach to valuation – specifically the Discounted Cash Flow model described above – those 9 basis points per year would have risen to 33 basis points per year at the same risk level. The model would have still struggled in 1998, but it would have earned alpha in each year from 1999-2001! At a 3% risk level, 33bps is not bad. Valuation accounts for only about 20% of the signal in our Global Asset Allocation work broadly. This would translate into a little over 150 basis points of annualized value added if each of the other components only contributed a commensurate amount of value added and were uncorrelated with the valuation component. An information ratio of 0.5 (150bps/300bps) is not too bad considering that the country selection decision is only one of the sources of alpha in this product. The asset class decision, the country selection decision within the fixed income asset class, and the currency decision are all designed to add alpha on top of that.

The combined use of near-term analysts forecasts and longer-term realized (historical, global industry mean) ROE is better than not only the simple Equity Risk Premium based on trailing 12mo earnings, but it is better than either the analysts forecasts alone or the realized ROE alone. On a trailing, cumulative alpha basis, the combination of

analysts’ near-term forecasts with longer-term ROE outperforms the alternatives over the last year, three years, five years and ten!

Cumulative Value Added Comparison Valuation Measure Based Upon:

	Equity Risk Premium (Stock Earning Yield - Cash Yield)	Comined Use of Realized ROE and Near-Term Analysts Forecasts	Use of Only Realized Industry Mean ROE	Use of Only Analysts Forecasts
1yr	-0.21%	0.03%	-0.24%	-0.98%
3yr	0.39%	7.56%	5.16%	-2.28%
5yr	-1.78%	-1.23%	-7.44%	-12.50%
10yr	4.37%	7.68%	-5.07%	-10.17%

Conclusion

We’ve been able to solve some of the problems with bottom-up valuation to make it work for us in a country selection context in our Global Asset Allocation work. Our historical rejection of analysts’ forecasts has been circumvented by choosing to employ only near-term forecasts and to rely upon a purely objective measure of valuation for long-term expectations. This allows valuation to be responsive to near-term changes in prospects, but rejects the long-term biases that are inherent in analysts’ projections.

The improvements in alpha are relatively small but not inconsequential. These come with improvements in the intuitiveness of the construction. Our valuation measures are now customizable to the specific indices we trade (e.g., local indices upon which index futures are based), and they are now able to adapt to changes in the sector exposures that indices have experienced in very recent years.

³ Australia, Canada, France, Germany, Hong Kong, Italy, Japan, Spain, Switzerland, UK, and US.



Discounted Cash Flow Approach

The dividend discount model (DDM, Equation 1) is a classic tool for valuing stocks. However, this approach has significant drawbacks due to its reliance on an estimate of the future stream of dividends, especially when valuing stocks internationally where payout ratios are not comparable. The following equations discuss a method of valuing a company based on a revised version of the DDM that instead looks to the return on equity (ROE) as representative of the expected future cash flows.

$$\text{Equation 1} \quad V_t = \sum_{i=1}^{\infty} \frac{D_{t+i}}{(1+r_e)^i}$$

where V_t = price at time t
 D_t = dividend at time t
 r_e = internal rate of return (IRR)

The starting point for addressing the first issue is described in a working paper by Frankel and Lee². In this paper they articulate that the pitfalls that exist in international valuation (due to discrepancies in accounting standards and practices) can be avoided by using an alternate formulation of DDM, the so-called Discounted Residual Income/EBO or ROEDM:

$$\text{Equation 2} \quad V_t = B_t + \sum_{i=1}^{\infty} \frac{E_t[(ROE_{t+i} - r_e) * B_{t+i-1}]}{(1+r_e)^i}$$

where B_t = book value at time t
 $E_t[.]$ = Expected value of . at time t
 r_e = internal rate of return
 ROE_{t+i} = Return on Equity for period t+i

This relationship is derived through application of the Clean Surplus Relation (Equation 3), which states that the book value changes over time based on retained earnings.

$$\text{Equation 3} \quad B_t = B_{t-1} + E_t - D_t$$

Combined with the DDM, the Clean Surplus Relation allows us to model the value of a firm without the necessity of projecting future dividends. Instead, it relies on the expected future cash flow, which is approximated by the expected return on equity.