# The Law of One Alpha

*As there is one price, there is only one mispricing.*

Bruce I. Jacobs and Kenneth N. Levy

Arbitrage ensures that there is only one price for a single financial instrument at any one time. If a share of Apple Computer is trading at $40 in New York, it can't trade at $45 in Chicago.

But it is estimates of *mis*pricing that make a market. Investors have different horizons, different cash flow needs, different economic outlooks, and different approaches to valuation. Their expectations for any given stock are likely to differ accordingly.

Should what holds true for investors in general also hold true for a single investment firm? In particular, for quantitative firms, where "discipline" connotes a philosophy as well as an investment approach, does it make sense to have multiple expectations for the same stock? Yet multiple expectations may be the result when a single firm applies a variety of models to its investment portfolios.

Consider a firm that manages a "core" portfolio whose selection universe is coterminous with some broad market index such as the Russell 1000 and a "value" portfolio whose selection universe comprises 500 stocks within that broader universe. The firm presumably has a single expectation (or a single range of expectations) for each stock in the broad, core universe. Should it have a second set of expectations for the 500 stocks that form the value subset of that universe?

If the firm uses one model for selecting the core portfolio and a different model — a specialized "value" model — for selecting the value portfolio, it is virtual-

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ly guaranteed to come up with two different expectations for each of the 500 value stocks — one expectation from the core model, and one from the value model. Even if it uses the same model, but applies it separately, first to the core universe and then to the value subset, the expected returns will differ between the two universes, because the model coefficients are bound to differ between the broad universe and the smaller subset. What if the model run on the broad universe shows GM outperforming Ford, while the model run on the value subset shows the reverse?

The firm could ensure consistency by using separate models for each subset of its selection universe — growth, value, small-cap, whatever — and then, for the core portfolio, linking the results via a single, overarching model that relates all the subsets. This would work if the market were constituted of discrete groups of stocks that are totally uncorrelated with each other. Growth stocks do behave differently from value stocks, as small-cap stocks behave differently from large-cap stocks. But do style groupings constitute distinct market segments, each subject to its own distinct pricing mechanism?

We think it unlikely. Consider an out-of-favor growth stock that slips into the value category, or a small-cap company that matures into the large-cap group. Does such a transition signify a qualitative change in the underlying company? Should its stock now be subject to a different pricing mechanism?

All stocks share similar characteristics, or attributes; all may be categorized by market capitalization, by price/earnings ratio, by a dividend discount model notion of value, or any number of variables. It is the magnitudes of these characteristics, rather than their nature, that differ across stocks and may differ markedly across stocks of different styles and industries. To the extent these differences affect the sensitivities of stocks to economic and market forces and their attractiveness to investors, stock returns can and will differ.

Value stocks and growth stocks represent, not two distinct market segments, but the extremes on continuums of P/E, dividend yield, and other attributes.* Investors who favor certain levels of these attributes — low P/E or high yield, for example — will find stocks at these levels attractive and other stocks unattractive. Imbalances — say, too pronounced a predilection on the part of investors for either growth or value — will lead to self-correcting arbitrage. This arbitrage makes for a single, integrated market subject to a single pricing mechanism.

Modeling each style grouping separately, as if it were a universe unto itself, is not the best approach if the market is integrated. This is because each subset model is bound to ignore information contained in the other subsets. The behavior of growth stocks, for example, may have a lot to say about the behavior of value stocks, the two groups anchoring opposite ends of the P/E continuum. Totally independent subset models are not optimal because they do not utilize all available information.

The opposite tack — modeling the broadest possible selection universe, and using the results to construct a variety of portfolios — is much the better approach (see Jacobs and Levy [1995]). Because it is based on a large, diverse cross-section of stocks and stock characteristics, this approach can take advantage of all available pricing information. (It also reduces multicollinearity in the model variables and leads to more robust parameter estimates.)

The return attribute relationships indicated by the model are thus more stable, hence more predictable, than those that may be garnered from a model focusing on a narrower subset of stocks that exhibit less diverse behavior. And, importantly, this approach ensures a consistent view of every security's potential: Each stock will have one and only one expected alpha.

At the end of the day, there is only one true mispricing: A given stock's price will have changed by a given amount relative to its price at the start. It hardly makes sense to begin the investment selection process with an approach that allows for the possibility of multiple mispricings for a given stock over a given horizon.

## ENDNOTES

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*Warren Buffett, the quintessential value investor, also views growth and value investing as "joined at the hip" (*Wall Street Journal*, February 15, 1995, p. A3).

## REFERENCE

Jacobs, B.I., and K.N. Levy. "Engineering Portfolios: A Unified Approach." *Journal of Investing*, Winter 1995, forthcoming.