
EDITORIAL COMMENTARY

Categorical Thinking in Stock Portfolio Management: A Puzzle?

Puzzles have become a popular way to question financial concepts. Many scholars, who are in Paul Samuelson's line of thinking, have advanced knowledge in Finance and Economics by proposing and explaining interesting paradoxes. Here we introduce a puzzle linked to categorical thinking in stock portfolio management. Institutional investors, such as pension funds and university endowments, use investment consultants for establishing investment policies and guidelines, strategic asset allocation decisions, active vs. passive investment decisions, selection of active managers, and performance measurement. To this end, they look for guidance on how to allocate the fund's assets among various asset classes, and select individual manager styles for each class. This approach leads to categorical portfolio allocation, whereby money managers are labeled depending on their specific investment style. On the domestic stock side, a categorical approach or multi-layered structure might include such asset subclasses (styles) as large-, mid-, and small-cap with additional categories for the value and growth styles. On the fixed income side, the choices usually include U.S. Treasuries, high-yield bonds, emerging market debt, and callable bonds such as mortgage-backed securities.

We concentrate on the stock portfolio allocation process after the strategic asset allocation has been determined between Stocks and Bonds. The puzzle appears with the methodology of selecting different layers for stock portfolio allocation. In fact, as the two-fund separation theorem states, every 'rational' investor should allocate his/her wealth between the money market fund for the risk-free allocation and the market portfolio for the risky allocation. In practice, institutional investors apply these theoretical results as they use mean-variance optimizers to select the optimal portfolio allocation. They understand that low correlation between layers creates more efficient portfolios in the risk-return space and use this argument to justify a layer approach for their asset allocation decisions. Moreover, they prefer the industry to introduce new "layers" with low correlation with the prevailing layers to increase the financial efficiency of the overall portfolio. In this context, why would the institutional investors not conform completely to the theory and select directly an index fund, which by definition would

not only provide the largest diversification effect but should also be the most cost-efficient? In summary, institutional investors are using the mean-variance framework as a benchmark model but not using its basics conclusions. This is the inconsistency or puzzle that we are addressing here.

What are the explanations for this puzzle?

The first potential explanation is the "search for positive alphas." The goal of any active management mandate is the generation of positive alpha for the overall portfolio. Institutional investors are looking for active portfolio managers, who are themselves trying to obtain positive alphas in their respective opportunity sets, depending on their respective benchmarks. In particular, the 'stock-picking' approach to investing, usually justified by extensive fundamental research of the companies is a very popular technique. There are also 'quant shops' that would implement mathematical and statistical techniques in order to generate consistent excess returns over the given benchmark. In addition to managers with the fundamental approach and the quantitative managers with state-of-the-art information processing skills, there has been a surge of a new set of managers who hope to capitalize on behavioral biases. Behavioral managers believe that perception-induced biases result in significant inefficiencies with a potential for positive alpha generation. Despite numerous studies, empirical evidence does not allow to conclude whether active managers have the ability to generate positive alpha in a consistent manner. Consequently, attempts in selecting individual active managers will not result in consistent positive alphas and the quest for positive alpha is not a convincing explanation of the puzzle.

The second potential explanation goes along the lines of some recent academic research in behavioral finance.

In particular, investors may use categorical thinking as a framework to decide on the asset allocation process. Indeed, even the father of normative portfolio theory, Harry Markowitz, made the following comment when asked how he was allocating his retirement money: "My intention is to minimize my future regret. So, I split my contribution 50-50 between bonds and stocks." What he did was basically to use the "1/n heuristic" rule in the case of two categories. This rule is

also used to explain the behavior of individual investors in 401(k) plans. Markowitz's decision could also be explained by Herbert Simon's Bounded Rationality argument, for which he won the Nobel prize: Markowitz could have been engaged in what Simon calls "satisficing," coming up with heuristics that yield satisfactory solutions that could be labeled as suboptimal by a rational approach. "Satisficing" is an optimization methodology that involves emotions, adaptive learning and cognitive biases. Simon calls for individuals to "satisfice", that is, to optimize until it is close enough in the traditional sense of optimization. By contrast, the traditional way of optimizing is a maximization of a utility function subject to budget constraints, as in the classic economics framework.

Another behavioral explanation results from the notion that behavioral investors are often assumed to build portfolios as pyramids of assets, layer by layer. The layers, or categories, are associated with particular goals and particular attitudes toward risk. Some money is put into the downside-protection layer, designed to avoid poverty; other would be in the upside-potential layer, designed to try to become rich. Simultaneously, some money could be in a regret-minimization layer invested in index funds; and/or in a diversification-maximization layer invested in absolute return strategies. Even if this behavioral argumentation seems to have a sound theoretical ground in the case of different markets, such as bond, foreign exchange and commodities, the puzzle here relates to the allocation between different "styles" in stock portfolio management. These behavioral arguments cannot be applied to this particular case. Indeed, many proxies can be used to replicate the stock portfolio. For instance, a comprehensive proxy would be the Wilshire 5000. The theory tells us that when using static strategies, there is only one efficient tangent portfolio. Therefore, the tangent portfolio involves fixed proportions in the different stock styles. Altering these proportions is inconsistent with the theory. In practice, the way stock styles are defined is so vague that it is being changed over time. Morningstar recently announced a new methodology for calculating the Morningstar Style Box,TM which is a nine-square (3x3) grid with three size categories, namely large, medium, small, based on capitalization, and three style categories, growth, blend, and value. In the pursuit of better classification of mutual fund managers, they introduced more factors (10 rather than 2) that include some growth measures in addition to price variables. Morningstar's position is a larger number of factors reflects the portfolio performance better. They claim that: "... since different factors go in and out of fashion, the new style box provides a more accurate snapshot of what a manager is doing." The fact that the methodology used to build the style box is changed confirms our belief that the styles/categories are arbi-

trarily defined rather than having sound theoretical grounds.

A further behavioral explanation of the puzzle may lie in the need of establishing systematic portfolio management rules in order to simplify the allocation decision process. Thinking about investments in terms of categories is particularly attractive to institutional investors, who, as fiduciaries, must follow systematic rules in the portfolio construction process. It has been postulated that categorical portfolio management simplifies the investment process of institutional investors in relation to a stock picking strategy, and provides a consistent way of evaluating the performance of money managers. We do not believe these are sufficient reasons to delve into the practice of creating loosely defined styles, work with the investment consultant to select the right styles, and ultimately pick the money managers to manage the selected categories. It is unclear how this would simplify the investment management process. More importantly, the so-called systematic rules are vulnerable to the second-guessing of the investment committee members as it relates to new investment strategies. These investment categories could turn out to be the ex-post "winners," creating regret among all the parties involved in the decision making process. Because of this fear of regret or disappointment, institutional investors are often transferring the responsibility of selecting optimal portfolios to active portfolio managers and consultants. The option bought by institutional investors turns out to be very expensive for it creates a fuzzy structure for the total fund.

Another route in explaining the puzzle is to loosen the constraint that investors cannot rebalance their portfolios continuously, and consider a dynamic approach to portfolio allocation. Dynamic strategies are used in some areas of the money management industry. An example would be the implementation of portfolio insurance strategies, where the manager tries to replicate the payoff stream of an option. The reason for the use of a dynamic strategy is to take advantage of the new information revealed by prices or macroeconomic factors to optimally reallocate the funds among various layers. The usefulness of dynamic rebalancing has also been shown in academic research. For example, the mean-variance efficient frontier can be improved by employing dynamic portfolio strategies in a Black-Scholes framework and an investor using a mean-variance approach for risk management, would reach a higher level of financial efficiency when using dynamic rebalancing rules. Robert Merton, the father of "continuous-time finance," pointed out that investors should attempt to hedge their portfolios against adverse shifts in asset return distributions due to the changes in distributions over time. In the general version of the ICAPM (Intertemporal Capital Asset Pricing Model), there is a need for several state-vari-

ables in order to hedge more specific aspects of future consumption-investment opportunities. Merton showed that if you are able to identify factors driving the returns of individual securities, then you end up with the $(N+2)$ -fund separation theorem, N representing the number of factors used in the model. How does this fund separation work and how is it different from any other 'static' version of fund separation? We can define three steps. The first step is to define different sources of risk called 'drivers.' These might be macroeconomic variables like short-term interest rate, inflation, currency exposure or unemployment rate. The second step is then to introduce the 'layers' to be used by the institutional investor. These layers should consist of:

- a money market fund, acting as the risk-free asset,
- an index fund that provides diversification and a hedging opportunity,
- a number of specialized funds designed to hedge against all the remaining types of risk defined as 'drivers.'

The third step involves continuous rebalancing among all of these different funds. The optimal construction involves is a dynamic strategy incorporating all these different funds. This strategy enables institutional investors to rebalance investment portfolios among a distinct (mutually exclusive) set of funds. An important feature of the dynamic explanation to the puzzle is that the same specialized funds ought to be used by institutional investors, even though they might differ a great deal in their risk preferences. The optimal dynamic rule for a given investor most certainly depends on the particular risk profile. In other words, the allocations into exogenously determined specialized

funds should differ from investor to investor, and not the funds themselves. The explicit consideration and implementation of dynamic management of categories/styles not only provides a theoretical explanation of the puzzle but also is theoretically the most efficient way of managing stock portfolios. However, there is no evidence that institutional investors are behaving as if they are dynamically rebalancing the total portfolio. On the contrary, to the best of our knowledge, no institutional fund is using a dynamic allocation approach. In addition to calendar- and price-based rebalancing of somewhat ad hoc nature the only other time the institutional investors adjust the portfolio allocation is subsequent to a major event, such as a drastic change in the investment policy, a change in the management or a market crash. This dynamic justification of the puzzle, hence, does not appear to be very convincing.

Despite the reluctance of many investors to apply the result of the two-fund separation theorem, the same investors are using Tobin's argument to justify their overall investment strategy. We provided theoretical explanations of this puzzle, although none of them are really convincing. Further research should be conducted to bring further explanations and thoughts to better understand the behavior of institutional investors.

Acknowledgments

This research is supported by a grant from the BSI Gamma Foundation.

Isabelle Bajeux-Besnainou
The George Washington University
Kurtay Ogunc
Watson Wyatt Worldwide

Copyright of Journal of Behavioral Finance is the property of Lawrence Erlbaum Associates and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.