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The economic benefits of market timing the style allocation of characteristic-based portfolios

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ABSTRACT

Many exchange traded funds track simple characteristic-based equity portfolios such as the market capitalization, the fundamental value or the inverse volatility portfolio. This paper provides theoretical and empirical evidence for the economic benefits in exploiting the timing-gains that result from the time-varying relative performance of these characteristic-based portfolios. Under a factor model for expected returns, we show that this dynamic portfolio allocation can be efficient across the low-dimensional set of characteristic-based portfolios. We assess the out-of-sample performance on the S&P 100 universe over the period 1990–2013 and show gains in stability and significant positive risk-adjusted returns for the dynamic style portfolio. We conduct several robustness tests and extensions confirming the benefits of dynamic style allocation across characteristic-based portfolios.

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1. Introduction

Skepticism about the net value of active portfolio management has spurred the increasing popularity of exchange traded funds (ETFs), which track the performance of simple characteristic-based portfolios. Often, portfolio weights are set to normalized versions of the individual stock characteristics. The best known is the market capitalization portfolio but over the past few years, alternative characteristic-based portfolios have become increasingly popular in the investment market (Bloomberg, 2014; Flood, 2013). Examples include fundamental value portfolios where the stocks' weights are a function of accounting measures such as revenues and dividends, and low risk portfolios where the weights are inversely related to the stock's volatility. In this paper, we propose and evaluate dynamic style investment strategies invested in these characteristic-based portfolios to exploit the time-varying differences in relative performance.

The proposed dynamic style portfolios aim to achieve mean-variance efficiency by not investing directly in the underlying stocks, but in the characteristic-based portfolios. This approach of dynamic style investing instead of optimizing the portfolio over all assets assumes that, at least one of the characteristic-based portfolio is (close to being) mean-variance efficient. This assumption matches with the common view that, while they do not explicitly require a return forecast, the portfolio weights based on these stock characteristics are good proxies for a mean-variance efficient portfolio in the long run.[1] However, it is unlikely that one characteristic will always lead to a mean-variance efficient portfolio. We argue that it is more likely that there is time-variation in the mean-variance efficient choice of the characteristic used for weighting the equity portfolio. This intuition is supported by ample empirical and theoretical evidence of the time-variation in the relative performance of characteristic-based portfolios (see, e.g., Amenc, Goltz, & Le Sourd, 2009; Barberis & Shleifer, 2003; Chen & De Bondt, 2004; Lucas, van Dijk, & Kloek, 2002). Thus, this time-variation creates the opportunity to exploit the differences in performance by market timing the style allocation to the underlying characteristic-based portfolios. In fact, low risk stocks usually have a beta lower than unity, and thus they tend to outperform the market capitalization portfolio in down markets and underperform during a market rally (Ang, Hodrick, Xing, & Zhang, 2006; Baker, Bradley, & Wurgler, 2011). Fundamental value portfolios tend to underperform the market capitalization portfolio in the run-up to a speculative bubble, such as the high-tech bubble (Hsu & Campollo, 2006). DeMiguel et al. (2009) show that optimization-based portfolios outperform an equally weighted portfolio when assets exhibit high idiosyncratic volatility. Thus, intuitively, it seems unlikely that one characteristic is sufficient to construct an optimal portfolio and if this were the case, that this characteristic is always the same over time.

In the proposed dynamic style portfolios, we model the mean-variance efficient weights as a linear combination of a set of characteristic-based portfolio weights. We then find the weights that are efficient under this restriction. The dynamic feature of the portfolio is crucial for allowing investors to benefit from the market timing opportunity associated with the life-cycle specificity of each characteristic-based portfolio. The time-varying weights placed on each of the proxies provide information about the expected individual performance of the characteristic-based portfolios. We show that the optimality of this portfolio is consistent with both the factor model of Haugen and Baker (1996), which predicts a time-varying payoff related to the different stock characteristics, and the widespread evidence of time-variation in the conditional distribution of asset returns. Our optimality result is also related to the multi-factor extensions of the CAPM model where firm characteristics are seen as drivers of stock returns (see, e.g., Hjalmarsson & Manchev, 2012 and the references therein).

The *mean-variance dynamic style* (hereafter MVDS) portfolio allocation methodology is thus a rule-based investment strategy aiming at exploiting the market timing opportunity associated with the time-variation in relative performance. An important feature of its design is that it can be applied

[1] For the market capitalization portfolio, this intuition is related to the well-known result that under the Capital Asset Pricing Model (CAPM), the market capitalization portfolio invested in all assets (not only equities) is the maximum Sharpe ratio portfolio. See Arnott, Hsu, and Moore (2005) and Treynor (2005) for studies of the optimality of the fundamental value portfolio, Haugen and Baker (1991) and Baker and Haugen (2012) for low risk stocks, and DeMiguel, Garlappi, and Uppal (2009) and Windcliff and Boyle (2004) for the equally weighted portfolio.