



Outperformance in exchange-traded fund pricing deviations: Generalized control of data snooping bias

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Abstract

An investigation into exchange-traded fund (ETF) outperformance during the period 2008–2012 is undertaken utilizing a data set of 288 U.S. traded securities. ETFs are tested for net asset value (NAV) premium, underlying index and market benchmark outperformance, with Sharpe, Treynor, and Sortino ratios employed as risk-adjusted performance measures. A key contribution is the application of an innovative generalized stepdown procedure in controlling for data snooping bias. We find that a large proportion of optimized replication and debt asset class ETFs display risk-adjusted premiums with energy and precious metals focused funds outperforming the S&P 500 market benchmark.

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1. Introduction

Exchange-traded funds (ETFs) are variants of mutual funds that first came to prominence in the early 1990s. ETFs allow market participants to trade index portfolios, similar to how individual investors trade shares of a stock. They seek to track the value and volatility of an underlying benchmark index through the construction of portfolios replicative of the index's constituents. They were first traded on the Toronto Stock Exchange in 1989 and today's market

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boasts over 1,220 U.S. traded ETFs.¹ Investors seeking ETF outperformance may be tempted to apply a number of performance measures to a large data set of ETFs in order to test for those that are profitable. Given enough tests, they are virtually certain to uncover individually significant ETFs and may naïvely use these as a basis for portfolio selection decisions. However, in such a set-up, there is a likelihood that these *seemingly significant* outperformers are due to mere chance alone. As the number of simultaneous tests conducted increases so too does the likelihood of such false discoveries. This issue is known as data snooping bias and must be controlled for when studying ETF outperformance. A key contribution in this study is the use of an innovative procedure, proposed in the literature, to control for this problem. The paper further uses an extensive ETF database that offers significant geographic and sector coverage. In this way, the paper provides robust first stage guidance to investors of where inefficiencies may be and, accordingly, where ETFs may provide some investment advantages. The main item of note from the implementation is that, when performance is analysed on a non-risk-adjusted basis only, no funds in the sample are identified as displaying any measure of outperformance. It is only the risk-adjusted performance measures that give statistically significant outperformance results and so the insights from these results dominate the commentary. The key takeaways from the study are, firstly, a high proportion of optimized replication, debt asset class, and global/international ETFs exhibit risk-adjusted premiums, highlighting redemption in kind inefficiencies. Secondly, cross-sector and sectoral funds display broadly the same percentage of outperformance. Lastly, high expense ratio and recent inception date ETFs are more likely to exhibit index outperformance, which is of interest to investors seeking to outperform their benchmarks.

The reason for the growth in popularity of ETFs over recent years can be attributed to a number of advantages that they offer over other index-linked products. Tax efficiency and lower expenses are the two most frequently mooted draws for investors, with another being smaller transaction quantities than equivalent futures products, a feature allowing retail investors the opportunity to participate in the market. Empirical studies on active mutual funds have found that, on average, they do not produce above normal returns. Malkiel (1995) and Gruber (1996) show that this inability to beat the market is primarily due to the level of management expenses charged. This performance outcome has increased interest in passive market tracking funds. ETFs aim to replicate index performance but with lower transaction costs and greater tax efficiency than observed in comparable mutual funds. Actively managed ETFs, whose goal is to realize above market returns, only release information on their specific holdings at an end-of-day frequency, whereas the weighted constituents of the passively managed ETFs are always known. Rompotis (2011) cites this as a reason why passive ETFs are advantageous in the eyes of potential arbitrageurs and for their retention as the more popular ETF type. Other miscellaneous strengths of ETFs that have contributed to their rise in popularity have been explicitly identified. Firstly, ETFs provide diversification satisfying broad exposure, be it marketwide or sectoral coverage, with sectoral ETFs facilitating hedging requirements. Secondly, Yu (2005) and Alexander and Barbosa (2008) observe that ETFs do not have short selling restrictions in the same manner as regular stocks so they may be more useful for hedging. Lastly, ETFs are not subject to the uptick rule, which Curcio, Lipka, and Thornton (2004) suggest as another benefit for shareholders.

A set of 288 U.S. traded ETFs is evaluated in this study using hypothesis tests that seek to identify those that outperform their net asset value (NAV), their underlying index, or a market benchmark. A major contribution to the literature here is the utilisation of a generalized data snooping bias procedure in the ETF performance appraisal setting. Data snooping bias, in this

¹Investment company institute June 2012 ETF report: http://www.ici.org/etf_resources/research/etfs_06_12 (accessed 10/30/12).

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